# MEASURING "FLOW" IN MICHIGAN YOUTH FIREARM DEER HUNTERS AND IMPLICATIONS FOR HUNTER RECRUITMENT

By

Michael Winthrop Everett

## A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

Community, Agriculture, Recreation, and Resource Studies - Doctor of Philosophy

#### ABSTRACT

# MEASURING "FLOW" IN MICHIGAN YOUTH FIREARM DEER HUNTERS AND IMPLICATIONS FOR HUNTER RECRUITMENT

By

## Michael Winthrop Everett

The steady decline of populations taking up recreational hunting is cause for concern among state and federal wildlife agencies. Young hunters are the future of hunting. As the average age of hunters continues to increase, young people participating in hunting activities provide an opportunity for insight to change the current declining trend. Flow theory and hunter satisfaction have both received extensive attention in research literature, however they have been utilized in separate and disconnected settings. An attempt to combine both constructs, as a way to measure intrinsic and extrinsic motivational, mood, and flow indicators of youth hunters has not been attempted to date. Measuring and understanding antecedents of "flow" in youth is an important consideration when determining why youth enjoy hunting as an outdoor recreational experience. This exploratory study utilizes flow theory and the four-channel model of flow to examine relationships among youth hunters' (12 to 16 years of age) experiences and satisfaction during Michigan's Special Youth Firearm White-tailed Deer Hunt (n=43). This research provided a snapshot in time of young hunters, their experiences and the satisfaction of those experiences during the youth hunt. Of the youth participants in this study, 69% indicated that they intend to go back out in the field for Michigan's opening day of firearm deer season (November 15, 2012). Additionally, 97.6% of youth respondents intend to hunt in future years, providing support for implementation of special hunting opportunities where youth and mentors can enjoy the experience of hunting together. This exploratory research suggests that there is a significant and direct relationship between "flow" experiences and young hunters that hear deer

and other animals, and see white-tailed deer. Knowledge of congruence between "flow" experiences and hearing deer and other animals, and seeing white-tailed deer offers the opportunity for further research on a much broader scale of licensed young hunters in Michigan. This research also has the potential to inform recruitment and retention personnel of state wildlife agencies about ways to support programs that promote hunting activities within younger populations in the future.

## ACKNOWLEDGEMENTS

The past several years have been a journey. A journey for me that took time, perseverance, and support from a variety of people. I would first like to thank my dissertation committee. My dissertation committee includes Dr. Meredith Gore from Fisheries and Wildlife, and Drs. Rick Paulsen and Shari Dann from the Department of Community, Agriculture, Recreation, and Resource Studies. I would also like to pay a special thanks to my committee chair, Dr. Chuck Nelson. Dr. Nelson has provided unending amounts of support from not only an academic perspective, but also a personal perspective by talking about hunting and opportunities to grow in Michigan's great outdoors. Thank you so very much.

I would also like to thank the Michigan Hunter Education (MHE) Administration and Instructors that made this research possible. I would like to thank Cpl/Specialist Peggy Ruby, Southern Michigan Hunter Education Field Coordinator, and Shar McConeghy, Recreation Education Program Coordinator, both of the Michigan Department of Natural Resources. I would also like to thank the following MHE instructors for providing support and a site for my research: Tom Wanless, Geoff Hendricks, Derek Russ, Clint Thomas, Wayne Hansen, Ray Haywood, Dennis Niles, Jim LePeak, Larry Martin, and Greg Gerding.

As for my family, they are first and foremost in my world. However, there have been times when my program has been the center of my universe and without fail, they have all been supportive of my situation with school and work. Jill is my best friend and a wonderfully supportive wife. Parker and Aubrey are the most understanding kids a husband and father could have. I look forward to the future and opportunities to make their lives better as I continue on the journey.

iv

# **TABLE OF CONTENTS**

LIST OF TABLES	viii
LIST OF FIGURES	XV
CHAPTER 1	
INTRODUCTION	1
Statement of Need	1
Overview and Definition of Terms	2
Statement of Purpose and Objectives	
Hypotheses	
Organization of Dissertation	
Summary	
CHAPTER 2	
BACKGROUND AND CONTEXT	
Examining Recreational, Subsistence and Commerical Hunting	
Worldwide Recreational Hunting	
Non-Consumptive Recreation and Leisure	
Consumptive Recreation and Leisure	
Worldwide Subsistence Hunting	
Worldwide Commercial Hunting	
The North American Model for Wildlife Conservation (NAMWC)	
Defining the NAMWC	
Limitations and Implications of the NAMWC	
An Amendment to the NAMWC	
The Hunter of Today	
The Michigan Hunter	41
CHAPTER 3	
LITERATURE REVIEW	
	10

Flow Theory	
"Flow" Literature in the Context of Outdoor Recreation	
Satisfaction with the Hunting Experience	

# CHAPTER 4

METHODS	
Measuring "Flow" and the Implications for Hunter	
Recruitment in Michigan Youth Firearm Deer Hunters	
Subject Selection	
Methods and Instrumentation	
Experience Sampling Method (ESM)	
Experience Sampling Form (ESF)	
Validity	
Reliability	
Analytical Methods	

# CHAPTER 5

RESULTS	
Survey Response	
Background Survey (Initial Participants)	
Background Survey (Participants That Completed All Surveys)	
Comparing Background Surveys for Non-Response Bias	
Results from the Experience Sampling Method	
Hunting Experience	
Indicators of Flow	
Mood Ratings	
Youth Hunting Experience and Satisfaction	
Intention to Continue Hunting	
Defining Flow, Anxiety, Apathy, and Boredom Channels	
Relationship Between Channels and Indicators of Flow	
Frequency of Channels Among Hunting Experiences	
Intention to Continue Hunting and its Relationship to Flow	

# CHAPTER 6

SUMMARY AND CONCLUSIONS	
Summary of Sampling Methods	
Summary of Procedures	
Summary of Findings	
Conclusions	
Discussion and Implications	
Recommendations	

APPENDICES
Appendix A: Parental consent and youth assent form.
Appendix B. Letter to parents and youth participants explaining research.
Appendix C: Background survey directions for youth firearm deer hunters.
Appendix D: Background youth hunter survey.
Appendix E: ESM hunting survey directions for youth firearm deer hunters.
Appendix F: ESM (AM/PM) hunting survey instrument.
Appendix G: Youth Wildlife Inventory.
Appendix H: Hunting experience and satisfaction survey directions.
Appendix I: Hunting experience and satisfaction survey instrument.
LITERATURE CITED

# LIST OF TABLES

Table 1.1. Definitions and characteristics of Recreation, Leisure,      Subsistence, and Commercial Hunting	3
Table 1.2. Defining the total recreation experience (adapted fromJensen and Guthrie, 2006) using hunting related examples	6
Table 1.3. Outline of Today's Hunter (Michigan Hunter Education)      Curriculum (MDNR, 2011b)	10
Table 2.1. Worldwide hunting Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES. Adapted from Bauer and Herr (2004, pp. 62-63)	25
Table 2.2. Tenets of the North American Model of Wildlife Conservation	
Table 2.3. Comparison between the North American Model of Wildlife      Conservation and AFWA framework	
Table 2.4. National Resident and Nonresident Hunter Churn, Adapted      From NSSF, 2009	43
Table 4.1. Survey instruments used in exploratory study	61
Table 4.2. ESM survey signaling protocol definitions and advantages	68
Table 5.1. Distribution of youth respondents that participated in the Background Survey (n=98)	
Table 5.2. Distribution of respondents (youth white-tailed deer hunters) who hunted with family and friends prior to the study (n=55)	
Table 5.3. Distribution of youth white-tailed deer hunters who hunted with family members prior to being able to shoot (n=84)	
Table 5.4. Initial background survey of youth hunters who watched a TV show, DVD, or video about deer hunting within the last year (n=81)	
Table 5.5. Initial background survey of youth hunters who played video games about deer hunting within the last year (n=78)	
Table 5.6. Enjoyment of being in the outdoors to youth respondents in the initial Background Survey data (n=98)	

Table 5.7. Enjoyment of Watching Wildlife to youth respondents in the      initial Background Survey data (n=98)	38
Table 5.8. Enjoyment of Hunting to youth respondents in the initialBackground Survey data (n=96). Two youth did not respond to the question	38
Table 5.9. Enjoyment of Fishing to youth respondents in the initial      Background Survey data (n=98)      8	39
Table 5.10. Enjoyment of Hiking to youth respondents in the initial Background Survey data (n=95). Three youth did not respond to the question	39
Table 5.11. Enjoyment of Camping to youth respondents in the initial      Background Survey data (n=98)	<del>)</del> 0
Table 5.12. Enjoyment of Shooting Sports to youth respondents in the      initial Background Survey data (n=98)	<del>)</del> 0
Table 5.13. Enjoyment of Sports to youth respondents in the initial      Background Survey data (n=98)      9	<b>)</b> 1
Table 5.14. Enjoyment of Gaming to youth respondents in the initial      Background Survey data (n=98)      9	€
Table 5.15. Distribution of youth white-tailed deer hunters who participated and completed the Background Survey, at least one ESM Hunting Survey, and the Hunting Experience and Satisfaction Survey (n=43)	)2
Table 5.16. Distribution of youth white-tailed deer hunters who hunted with family and friends prior to the research study and completed all survey aspects of the study (n=38)	<del>)</del> 3
Table 5.17. Distribution of youth white-tailed deer hunters who hunted with family and friends prior to being able to shoot and that completed all survey aspects of the study (n=38)	<del>)</del> 4
Table 5.18. Youth hunters who watched a TV show, DVD, or video about deer hunting within the last year (n=34) and completed all aspects of the study categories	95
Table 5.19. Youth hunters who played video games about deer hunting within the last year (n=34) and completed all aspects of the study	<del>)</del> 6

Table 5.20. Enjoyment of being in the outdoors to youth respondentsin the Background Survey data from those youth who completed allaspects of the study (n=43)	97
Table 5.21. Enjoyment of watching wildlife to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43)	98
Table 5.22. Enjoyment of hunting to youth respondents in theBackground Survey data from those youth who completed all aspectsof the study (n=43)	98
Table 5.23. Enjoyment of fishing to youth respondents in theBackground Survey data from those youth who completed all aspectsof the study (n=43)	99
Table 5.24. Enjoyment of hiking to youth respondents in theBackground Survey data from those youth who completed all aspectsof the study (n=43)	99
Table 5.25. Enjoyment of camping to youth respondents in theBackground Survey data from those youth who completed all aspectsof the study (n=43)	)0
Table 5.26. Enjoyment of shooting sports to youth respondents inthe Background Survey data from those youth who completed allaspects of the study (n=43)10	)0
Table 5.27. Enjoyment of sports to youth respondents in theBackground Survey data from those youth who completed allaspects of the study (n=43)10	)1
Table 5.28. Enjoyment of gaming to youth respondents in theBackground Survey data from those youth who completed allaspects of the study (n=43)10	)1
Table 5.29. Analysis to investigate any potential non-response bias.Comparison of total initial youth respondents (n=98) with youth whocompleted all survey (n=43)10	)3
Table 5.30. Comparison of previuous hunting partners where youth could not shoot in intitial Background Surveys and where all youth completed the Backgound Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey	)4

Table 5.31. Comparison of previous hunting partners where youth could not shoot in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey	
Table 5.32. Comparison of time spent watching a TV, DVD, or Video about deer hunting in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey	
Table 5.33. Comparison of time spent watching a TV, DVD, or Video about deer hunting in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey	
Table 5.34. Comparison of youth ratings of various recreational activities in initial Background Surveys (n=98) and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey (n=43)	
Table 5.35. Distribution of hunts by youth respondents who hunted Michigan's Special White-tailed Deer Hunting periods on September 22 and 23, 2012 (n=43)	
Table 5.36. Distribution of locations where youth respondents hunted during Michigan's Special White-tailed Deer Hunting periods on September 22 and 23, 2012 (n=43)	
Table 5.37. Distribution of what youth hunters thought about while hunting during Michigan's Special White-tailed Deer Hunting periods on September 22 and 23, 2012 (n=43)	112
Table 5.38. Distribution of white-tailed deer seen by youth deer hunting respondents that hunted Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 (n=43)	
Table 5.39. Youth respondents who shot at, hit a deer, tagged a deer, and the type of deer harvested during Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 by gender (n=43)	
Table 5.40. Youth participant ratings of the experience of finding that deer after harvest (n=16)	117
Table 5.41. Youth participant ratings of the experience of field dressing the deer after harvest (n=16)	117

Table 5.42. Youth participant ratings of the perceived challenge      of the hunting experience (n=84)
Table 5.43. Youth participant ratings of the perceived importance(Involvement Indicator) of the hunting experience (n=84)120
Table 5.44. Youth participant ratings of the perceived skill of the hunting experience (n=84)
Table 5.45. Youth participant ratings of wishing they had been doingsomething else (intrinsic motivation indicator) rather than the huntingexperience (n=84)
Table 5.46. Youth participant ratings of finding the hunting experienceinteresting (Merging Action and Awareness Indicator) (n=84)
Table 5.47. Youth participant ratings of how important hunting is to their future goals (Concentration On Task at Hand Indicator) (n=84)
Table 5.48. Youth participant ratings of will they talk about their huntswith friends (Self- Esteem - Peer Expectation Indicator) (n=84)123
Table 5.49. Youth participant ratings of how likely they will talk about their hunts with family (Self Esteem - Family Expectation Indicator) (n=84)
Table 5.50. Youth participant ratings of their own expectations during thehunting experience (Self Esteem – Own Expectations) (n=84)
Table 5.51. Youth participant ratings of their interest in the hunting   experience (n=84)   126
Table 5.52. Youth participant ratings of their interest in feeling as though they were doing the best that they could on the hunt $(n=84)$
Table 5.53. Youth participant ratings of their interest in feeling in control of the hunting experience (Paradox of Control Indicator) (n=84)
Table 5.54. Youth participant ratings of their interest in how goodthey felt about themselves during the hunting experience (n=84)
Table 5.55. Youth participant ratings of their interest if they felt   they were getting better at hunting (n=84)
Table 5.56. Mood ratings perceived by youth white-tailed deerhunters during Michigan's Special Youth White-tailed Deer Hunt

Table 5.57. Rating of the overall hunting experience by youth      hunters (n=42)	133
Table 5.58. Youth responses of the one most important reason for their overall hunting experience (n=42)	135
Table 5.59. Ratings of how prepared youth hunters felt for their overall hunting experiences (n=42)	136
Table 5.60. Youth responses of the one most important reason for felt preparedness of the overall hunting experience (n=42)	136
Table 5.61. Ratings of how comforTable youth hunters felt during their      overall hunting experiences (n=42)	137
Table 5.62. Youth responses of the one most important reason for comfort felt during the overall hunting experience $(n=42)$	137
Table 5.63. Ratings of the amount of deer youth hunters saw during their hunting experiences (n=42)	138
Table 5.64. Youth responses of the one most important reason for your rating of the number of deer seen during the overall hunting experience $(n=42)$	138
Table 5.65. Ratings of youth time spent with their hunting partner (n=42)	139
Table 5.66. Youth responses of the one most important reason for your rating of time spent with your hunting partner during the overall hunting experience $(n=42)$	139
Table 5.67. Youth intention to go archery hunting in 2012 (n=42)	140
Table 5.68. Youth intention to go firearm hunting on      November 15, 2012 (n=42)	141
Table 5.69. Youth responses of the one most important reason for your rating of the number of deer seen during the overall hunting experience (n=41)	142
Table 5.70. Youth intention to go hunting for other game (n=42)	142
Table 5.71. Other game youth have hunted or intend to hunt (n=42)	143
Table 5.72. Youth intention to go trapping in 2012 (n=42)	144

Table 5.73. Youth intention to continue hunting in future years (n=42) 14	45
Table 5.74. Youth responses of intention to continue hunting (n=36)	45
Table 5.75. Relationship between channels of flow, anxiety, apathy,and boredom to flow indicators during the Michigan Special Youth FirearmWhite-tailed Deer Hunt (n=84 hunts)	49
Table 5.76. Relationship between channels of flow, anxiety, apathy,and boredom to mood indicators during the Michigan Special Youth FirearmWhite-tailed Deer Hunt (n=84 hunts)1.	50
Table 5.77. Chi-Square Test of Association for differences in frequency of channels during Michigan's youth firearm white-tailed deer hunting experience and hearing deer and other animals, and seeing and shooting at deer (n=84 hunts)1	52
Table 5.78. Summary of experience measures of youth hunters with      discriminant analysis (n=84 hunts)	54
Table 5.79. Comparison of experience measures during youthparticipating in the Michigan Special Youth Firearm White-tailedDeer Hunt (n=84 hunts)	55

# LIST OF FIGURES

Figure 1.1. Theoretical model of "Flow" and non-flow constructs in youth hunting experiences	17
Figure 2.1. Worldwide Consumptive Wildlife Tourism. Adapted from Bauer and Herr (2004, p. 60). For interpretation of the references to color in this and	
all other figures, readers is referred to the the electronic version of theis disseration	23
Figure 3.1. Single channel "flow" model adapted from Csikszentmihalyi (1975)	49
Figure 3.2. The four-channel flow model applied to ESM. The origin for the optimal experience is the individual average of challenge and skills. Only when an individual is above that point does flow begin (Adapted from Massimini and	
Carli, 1988)	50
Figure 5.1. Participation and response rates of youth respondents (ages 12 to 16) during the ESM Hunting Experience	82
Figure 5.2. Youth respondents who shot at, hit a deer, tagged a deer, and the type of deer harvested during Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 (n=43).	116
Figure 5.3. The four-channel flow model applied to youth hunters during Michigan's Special Firearm White-tailed Deer Season (September 22 and 23, 2012)	147

#### **CHAPTER 1**

#### **INTRODUCTION**

#### Statement of Need

Hunting as a form of outdoor recreation is important to many Michigan citizens both young and old. For example, in Michigan, according to Frawley (2010), an estimated 686,000 hunters spent 10.2 million days afield during the 2009 hunting season (Frawley, 2010; U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau [FHWAR], 2007b). State and national research projected that hunter populations would continue to decrease in both Michigan and nationally over the long term (Enck, Decker & Brown, 2000; FHWAR, 2007a). For example, according to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation Study (FHWAR, 2007b) in 1996 in Michigan there were 934,000 distinct hunters, whereas in 2006 there were 753,000 distinct hunters, a decrease of 19%. Nationally, during the same time period, the metrics indicate that there were 13,975,000 and 12,510,000 distinct hunters in 1996 and 2006 respectively, a decline of 10% (FHWAR, 2007a). This is valuable information, since hunting is considered to be an important wildlife management tool (Riley, Decker, Enck, Curtis, & Lauber, 2003). From an economic perspective, according to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation Study, expenditures by hunters for hunting from a national perspective were \$22.9 billion (FHWAR, 2007a), whereas Michigan expenditures are nearly \$1 billion dollars (FHWAR, 2007b). Preliminary results of the 2012 FHWAR survey suggest that the number of distinct hunters from 2006 to 2011 has increased from 12.5 million to 13.7 million hunters nationally (FHWAR, 2012). Currently, the Michigan Fishing, Hunting, and Wildlife-Associated Recreation Study have not been released for 2006 to 2011.

## **Overview and Definition of Terms**

The term "outdoor recreation" is used to define experiences related to activities such as hunting and serves as the context for this research (Table 1.1). Additionally, outdoor recreation includes three descriptors that specify the spatial context of the outdoor recreation activity. These include: resource-based, intermediate, and user-based recreation (Table 1.1). In many instances, the terms recreation and leisure have been used interchangeably. Therefore, for the purposes of this dissertation "outdoor recreation," "leisure," and "recreation" will be used interchangeably. Research by Thompson, Rehman, and Humbert (2005), suggested that leisure habits can be facilitated through providing opportunities in safe environments for youth to participate in a variety of structured and non-structured physical activities, and hunting is just one example of this type of recreational experience. Jensen and Guthrie (2006) defined outdoor recreation based on previous research from Clawson and Knetch's definitions of resource-oriented and intermediate recreation (Table 1.1).

Driver, Brown, and Peterson (1991), defined the word "benefit" in two different ways to exhibit positive recreational gain. The term "benefit" can be summarized through both the monetary and non-monetary aspects of leisure. Monetary measures of benefit are also referred to as "economic efficiency" (Driver et al., 1991). Monetary benefits are economic in nature, but may also be indirectly related to physiological, psychological, and sociological attributes of recreation (Driver et al., 1991; Lewis & Kaiser, 1991; Siehl & Kostmayer, 1991). Conversely, non-monetary benefits are related to the physiological, psychological, sociological and spiritual wellbeing of recreation and leisure participants (Driver et al., 1991; Godbey & Jung, 1991; Goodale & Cooper, 1991). Non-monetary benefit is also referred to as "benefit-as-improvedcondition" (Driver et al., 1991). According to Driver et al. (1991), the rationale for this

	Definition	Related Literature
Recreation	A subset of leisure that has the following characteristics: 1) is an activity; 2) occurs during leisure time; 3) is voluntary; 4) is intrinsically engaging; 5) provides for a sense of competence; and 6) produces feelings of self-satisfaction or well-being.	Jensen & Guthrie, 2006
Commercial Hunting	Profiting from the sale of harvested wildlife. May include the profit obtained from meat, fur, antler, ivory, or other parts of wildlife.	Humle & Kormos, 2011
Consumptive Hunting or Harvest	Harvesting of wild terrestrial animals, which are eaten or used.	Muth et al., 2001; Bauer & Herr, 2004
Intermediate Recreation	Relies on natural settings from a human impact perspective. Includes a mixture of resource and user-oriented outdoor recreation. Examples include hunting and fishing on state or federal lands.	Clawson & Knetch, 1966
Leisure	Unobligated state of time that is when recreation occurs.	Driver et al., 1991;
Outdoor Recreation	Recreational experiences that occur in the natural environment and especially wild lands. These recreational experiences include a relationship between the participant and natural environment through appreciation and/or interaction.	Jensen & Guthrie, 2006
Resource-oriented Recreation	Or resource-based recreation. Relies on the use of natural resources in natural settings. Examples include hunting, fishing and camping	Clawson & Knetch, 1966
Subsistence Hunting	An activity where one relies on dietary need through the acquisition and use of fish and game species for consumption.	Condon et al., 1995; Cordain et al., 2000; Peloquin & Berkes, 2009; McGee, 2010

Table 1.1. Definitions and characteristics of Recreation, Leisure, Subsistence, and Commercial Hunting.

nomenclature is because economic metrics can be used to quantify the improved conditions of recreational activities. Hunting is an excellent example, where the hunter is the beneficiary of the "benefit-as-improved-condition," and the Michigan DNR receives the "economic efficiency" or benefit of the activity through license sales, management of land, and wildlife.

The word "benefit," according to Driver et al. (1991), "refers to a *change* that is advantageous - an improvement in condition, or a gain to an individual, a group, to society, or to another entity" (p. 4). A benefit is definable and measureable. Hence, researchers can model benefit to investigate cause and effect relationships (Driver et al., 1991).

It is clear that with today's ever-increasing time demands on youth (e.g., sports, homework, family and other potential activities), any time spent seeking one set of benefits (i.e. hunting) could result in loss of time at other activities (Winkler & Warnke, 2012). An example of measurement of benefit can be found in research conducted by Csikszentmihalyi and Kleiber (1991) in an effort to measure self-actualization through feelings of freedom and intrinsic motivation or motivation to engage in activities that enhance or maintain a person's self-concept. Maslow's hierarchy of needs provided an interpretation for self-actualization through being placed at the pinnacle of human motivation and needs (Maslow, 1943). Maslow's definition of self-actualization reflects human needs that are based on morality, creativity, spontaneity, problem solving, lack of prejudice, and acceptance of facts (1943).

The total recreation experience involves four phases: anticipation, planning, participation and recollection (Table 1.2) (Jensen & Guthrie, 2006). These phases play a vital role in defining the hunting experience. Jensen and Guthrie (2006) suggests that one can engage in having a recreation experience without having all four phases, however mindful participation in all phases can be most gratifying. In the case of hunting, one might hypothesize that the sum total of these

experiences are what keeps families hunting for generations. Much of the hunting literature today cites that the recreational value, as both "economic efficiency" and "benefit-as-improved-condition" are of primary importance (Driver et al., 1991). However, the recreational "value" of hunting as an outdoor recreation experience has served and will continue to serve as a cornerstone activity to many families and individuals alike for generations to come (Jensen & Guthrie, 2006; Petersen, 2010; Swan, 1995).

Flow theory was developed by Mihalyi Csikszentmihalyi (1975) as a way to describe feelings of joy from the intrinsic rewards of an activity, and not from extrinsic reward such as a trophy or monetary compensation (Csikszentmihalyi, 1975). Csikszentmihalyi (1975) found that intrinsic motivation gives participants a sense of discovery, exploration, and problem solution, hence a feeling of challenge based on an individual's skill level in an activity. According to Mitchell (1983), for "flow" to be achieved in an outdoor recreation experience, it is necessary for: (1) the recreationist to have freedom of choice among a wide range of uncertain outcomes to be possible; (2) the recreationist must creatively fashion these uncertainties into tasks that are perceived to be within his or her abilities; and (3) the recreationist must achieve a level of involvement such that the hunt and participating in the experience through action and awareness become indistinguishable. Self-actualization utilizing Maslow's definition provides a platform to measure "flow" in the context of hunting, through an individual's ability to process issues related to the morality, spontaneity, problem solving and acceptance of facts with regard to the hunting experience. So what is "flow" and why is it important?

Psychological definitions of leisure have gained prominence in the past thirty years. Authors have measured leisure by controlling for freedom and intrinsic or extrinsic motivation through studies conducted in laboratory settings (Lefevre, 1988; Mannell & Zuzanek,

Stage of Recreational Experience	Definition
Stage 1 Anticipation	Identification and consideration for pursuing the activity. Examples may include imagining or thinking about the harvest of a trophy white-tailed deer, setting up a tree stand, or considering where to scout for wildlife in the spring. Even if anticipation is the terminal point of actually doing the activity, this can serve a useful purpose.
Stage 2 Planning	Educational phase of preparation for the activity. Examples may be accomplished through reading books and magazines, discussions with family and friends, acquiring and organizing equipment and supplies as well as making arrangements for upcoming hunting experiences.
Stage 3 Participation	The actual experience of the activity. Examples may include travel time both to and from the hunting location. In the recreational experience, this is typically the shortest stage, however it is also the reason the other stages occur.
Stage 4 Recollection	Reminiscing and recounting the experiences that occurred during the participation phase of the activity. This phase may be expressed in oral or written form. Examples may include mementos of the hunt are often times the most significant components of this phase. Examples may include a harvested set of white-tailed deer antlers, a mount of the first harvested buck, photographs, or simply everlasting memories of the experience. There is no time limit on this phase. In fact, these memories and mementoes may be some of the most cherished experiences of one's life.

Table 1.2. Defining the total recreation experience (adapted from Jensen & Guthrie, 2006) using hunting related examples.

1988). However, in recent years there has been an increase in literature utilizing the field as a research setting to measure intrinsic motivation through "flow" experiences (Bassi & Delle Fave, 2010; Decloe, Kaczynski, & Havitz, 2009; Jones, Hollenhorst, Perna, & Selin, 2000; McIntyre & Roggenbuck, 1998). These authors view recreation and leisure as being related to a desirable state, such as the state of "flow" outlined by Csikszentmihalyi and Kleiber (1991). According to

Driver et al. (1991), leisure within the context of "flow" is considered to be a good or higher state, condition, or experience that provides a benefit. Since leisure behavior is considered to be intrinsically rewarding, the beneficial nature of leisure is analogous to outdoor enjoyment (Driver et al., 1991). Driver et al. (1991) suggested that there are five categories of beneficial consequences of leisure. These beneficial consequences include: (1) physiological; (2) psychological; (3) sociological; (4) economic; and (5) spiritual aspects related to changes in values, benefits, and costs (Driver et al., 1991).

According to Driver et al. (1991), benefit measures based on behavior include improvements in physical health (physiological), increased productivity (psychological), and family solidarity (economic, social and spiritual). Introspective measures can be either focused directly on benefits (improvement of conditions) or indirect measures (Driver et al., 1991). According to Driver et al. (1991) indirect measures do not focus on the improvement of conditions, but on the activity. Examples of indirect measures may include but are not limited to going hunting or fishing, tracking game and hiking with family members.

Several studies have helped researchers understand the complexities of hunter motivation and identification of factors related to satisfaction of the hunting experience (Cornicelli, Fulton, Grund, & Fieberg, 2011; Hammitt, McDonald, & Patterson, 1990; Langenau & Mellon, 1980; Manfredo, 2004). However, no research exists that compares the construct of "flow" in a hunting experience with youth hunter satisfaction ratings. Relationships between youth hunter satisfaction and constructs related to "flow" have the potential to provide causal relationships to the experience of the hunt. Decker, Brown, and Gutierrez (1980) suggested that many important variables affecting hunter satisfaction are beyond the scope of the wildlife manager. Additionally, McCullough and Carmen (1982) suggested that getting away from home,

companionship and enjoying nature are dependent on the experience of the hunter. By providing positive hunting recreation experiences to youth, the potential exists to create lifelong hunters. Implications of this research are that state wildlife management agencies may be able to improve youth intrinsic motivation and enjoyment during hunting activities in an effort to recruit and retain youth to become new hunters.

Additionally, Several studies have applied theoretical frameworks to hunter participation and involvement (Decker & Purdy, 1986; Decker, Brown, & Siemer, 2001). Decker, Brown, and Siemer (2001) have suggested that there is a need to better understand and predict hunting participation by designing programs that consider hunters' interest while meeting expectations, satisfaction, and motivation during the hunt. One approach by Decker and Purdy (1986) utilized the innovation-adoption theoretical framework to meet the needs of hunters within their Hunter Education courses. The authors' cited that development of a technique used to assess hunting involvement could be a helpful evaluation tool for Hunter Education program administrators (Decker & Purdy, 1986). The ability to apply flow theory as a way to address hunter participation and involvement may provide additional insight to hunter educators in an effort to provide engaging experiences to future youth hunters. Decker and Purdy (1986) cite these experiences as ways to increase involvement following a youths' certification in Hunter Education.

Youth are one of the most important audiences to recruit into hunting. According to the National Survey of Fishing, Hunting and Wildlife Associated Recreation (2007a), individuals 35 years of age and older make up 72% of the current hunters in the U.S., suggesting that the average age of hunters continues to increase. Further, by gender, males make up 91% of hunters (FHWAR, 2007a). According to Frawley (2006), the proportion of Michigan residents over the

age of 16 that hunted declined by 1% from 1991 to 2001. During the period of 2003 to 2005, only 6% of 12-year old residents participated in hunting activities in Michigan (Frawley, 2006). If hunting is to continue to be viable and make a dramatic impact, both economically (FHWAR, 2007a; FHWAR, 2007b), and from a recreational perspective (Driver et al., 1991; Jenson and Guthrie, 2006) a concerted effort to recruit and retain future hunters is imperative to the future of hunting.

Michigan Hunter Education (MHE) serves as the certifying entity for individuals, young and old, to learn about various aspects of wildlife management, conservation, hunting, shooting, and firearm safety. The MHE course provides certification in order for individuals to purchase a Michigan hunting license. Recreational and leisure concepts such as enjoying nature and participating in an activity in the outdoors can be incorporated into the curriculum through hands-on, student-centered learning where individuals who finish the course feel as though they have learned the basics of how to hunt, shoot safely, properly dress harvested game, and above all, feel more comfortable in the outdoors. Ideally, the end results are individuals who feel as though they are competent as hunters with the desire to want to go out and take part in future hunting activities.

In Michigan, if an individual was born after January 1, 1960, that person is required (by law) to take a course in Michigan Hunter Education (MDNR, 2011). There are three ways to complete Hunter Education in the State of Michigan. The first mode of learning is through the "traditional classroom" model. The traditional course model and corresponding goals include nine components as defined by the Michigan Department of Natural Resources (MDNR, 2011b) (Table 1.3). According to the MDNR, these courses are typically held at outdoor clubs, schools, police stations and camps. The second mode for course instruction is a home study approach to

learning (MDNR, 2011). Before taking the home study course, students must sign up to take a field class (shooting experience). The third mode to take Michigan Hunter Education is through a web-based, online learning format (MDNR, 2011). Students may enroll through one of two

Table 1.3. Outline of Today's Hunter (Michigan Hunter Education) curriculum (MDNR, 2011b).

Chapter	Overview
Chapter 1: Introduction to Hunter Education	Learning objectives for the course, why take Hunter Education and funding for Hunter Education.
Chapter 2: Know Your Firearm Equipment	Types, function, components and caring for firearms and ammunition.
Chapter 3: Basic Shooting Skills	Marksmanship and accuracy when shooting rifles, shotguns, and pistols.
Chapter 4: Basic Hunting Skills	Planning, preparation and strategies of the hunting experience. Shot placement and field care of game.
Chapter 5: Primitive Hunting Equipment and Techniques	Hunting basics, safety and skills needed for hunting with a muzzleloader, bow and arrow, and crossbow.
Chapter 6: Be a Safe Hunter	Firearm safety. Loading and unloading, transporting, proper carrying firearms. Hunting from elevated stands and boats. Use of All-Terrain vehicles while hunting.
Chapter 7: Be a Responsible and Ethical Hunter	Hunting laws, game conservation, fair chase, the hunter's image, hunting ethics, and the five stages of hunter development.
Chapter 8: Preparation and Survival Skills	Planning and preparation of the hunt. Physical conditioning, clothing, map and compass, survival skills, coping with weather extremes and basic first aid.
Chapter 9: Wildlife Conservation	Wildlife Conservation, The North American Model of Wildlife Conservation (NAMWC), wildlife management, and wildlife identification.

websites: http://www.hunter-ed.com/Michigan/ and http://www.huntercourse.com/usa/michigan/. Both courses are approved by the Michigan Department of Natural Resources to complete the classroom portion of the Michigan Hunter Education course (MDNR, 2011). However, online students must register for a skills/field portion of the class prior to completing the online curriculum. Once students have passed the online course of study and successfully completed the skills/field portion of the class, they receive their Hunter Education certification.

In 2012 Michigan certified 25,327 Hunter Education graduates. Of those, 23,457 were certified in a traditional course of study (92.6%), 1,669 (6.6%) were certified in a home study course, and 201 (0.8%) utilized an Internet option for certification. Age breakdown for the traditional course of study were: 7,855 (33.5%) less than 12 years of age, 9,671 (41.2%) 12 to 16 years of age, 1,968 (8.4%) 17 to 24 years of age, 3,285 (14.0%) 25 to 50 years of age, and 678 (2.9%) greater than 50 years of age.

Finally, another distinct pathway exists. An individual may hunt in Michigan without having taken the Michigan Hunter Education course. According the MDNR, an Apprentice Hunter may purchase a license for two years prior to successfully completing the Michigan Hunter Education course (MDNR, 2011a). When hunting, Apprentice Hunters must be accompanied by another licensed hunter who is 21 years of age or older (MDNR, 2011a). Additionally, Apprentice Hunter's under the age of 17 are required to be accompanied by a parent or legal guardian who is licensed in the same hunting season (MDNR, 2011a).

MHE courses are taught by volunteers in a format that is typically 2 to 5 sessions in length, followed by recommended time on a shooting range. Courses are offered year-round throughout the state. The MHE course has a required instructional time of 10 to 12 hours of instruction, but it is also offered in web-based and home study formats. The MHE course

provides an opportunity to give participants a hands-on, student-centered experience where principles of wildlife conservation and the North American Model of Wildlife Conservation are central to the outcomes of the course.

MHE is currently funded from the sale of firearms and ammunition through the Federal Aid in Wildlife Restoration Act (16 U.S.C. 669-669i; 50 Stat. 917) "Pittman-Robertson Act" (P-R) that was signed into law on September 2, 1937. The Act has been amended several times, and provides federal aid to States for Wildlife Restoration, Multistate Conservation, North American Wetlands Conservation Program, and the Firearm and Bow Hunter Education and Safety Program (U.S. Fish and Wildlife Service, 2013). The Michigan Department of Natural Resources (MDNR) utilizes P-R funding to support Hunter Education in Michigan. Monies within Hunter Education (HE) are used to provide curriculum and materials to individuals taking HE as well as providing professional development and classroom materials for staff to teach the course. According to the U.S. Fish and Wildlife Service (2013), for the fiscal year 2012, Michigan received \$12.3 million dollars from Pittman-Robertson appropriations at the Federal level. Of those monies, \$2.1 million was allocated for Hunter Education in Michigan (2013).

It is clear from the research that the future of hunting in the United States will be under increased pressure over time due to more urbanization, lack of access to hunting land, challenges with travel to accessible lands, and familial constraints (Organ & Fritzell, 2000; Zinn et al., 2002; Jacobson & Decker, 2006). According to the authors, these factors have the potential to increase nontraditional stakeholders interested in wildlife while continuing to decrease traditional hunter stakeholder populations, whereby increasing a nontraditional approach to wildlife management.

Increasing the number of hunters in Michigan through recruitment, retention and reconnection to hunting opportunities is clearly an important step to addressing potential challenges with management of wildlife populations while providing positive outdoor recreational experiences to young people. However, unknown antecedents that provide these positive outdoor recreational experiences are still in question.

## **Statement of Purpose and Objectives**

The purpose for this exploratory study was to determine if participation in recreational hunting activities (i.e. the Michigan Special Youth White-tailed Deer Hunt) resulted in "flow" experiences and if those experiences were related to behavioral intentions to continue hunting in the future. My research objectives include: (1) developing the experience sampling method (ESM) to measure youth firearm white-tailed deer hunter "flow," mood, level of challenge, and interest level in a hunting activity; (2) testing the experience sampling method (ESM) to measure youth firearm white-tailed deer hunter "flow," mood, level of challenge, and interest level in a hunting activity; (3) determining the level at which "flow" and "anxiety" occur relative to youth hearing, seeing, shooting at and harvesting white-tailed deer; and (4) determining if youth who experience various levels of "flow" are more likely than those who do not experience "flow" to state their intent to participate in further hunting opportunities.

#### Hypotheses

My overarching hypothesis of this study was that youth who are experiencing "flow" in a white-tailed deer firearm hunting context will express intention to hunt in the future, whereas youth that exhibit "boredom," "apathy," or "anxiety" during a white-tailed deer hunting experience will not intend to hunt in the future (Figure 1.1).

The first hypothesis was informed by flow theory (Csikszentmihalyi, 1975) through the measurement of the "flow" construct of the hunt using the four-channel "flow" model (Massimini & Carli, 1988). My null hypothesis 1 (Ho1) thus states that there is no statistical significance between youth firearm deer hunting experiences and respondents' perceived mood, level of interest and perceived challenge. Whereas, my alternative hypothesis 1 (H1) states that there is a positive relationship between respondents' perceived mood, flow indicators, level of skill, and perceived challenge using the four-channel model (Massimini & Carli, 1988).

Hypothesis two was informed by flow theory (Csikszentmihalyi, 1975) in the context of a youth white-tailed deer hunting experience relative to the four-channels (flow, anxiety, apathy, and boredom) of the flow model adapted by Massimini and Carli (1988). My null hypothesis 2 (Ho2) thus states that there is no association between youth firearm deer hunter experiences of hearing, seeing, shooting at, and harvesting deer relative to the constructs of the four-channel model (Massimini & Carli, 1988). Whereas, the alternative Hypothesis 2 (H2) states that there is a positive relationship between respondents' levels of "flow" and "anxiety" and experiences of hearing, seeing, shooting at, and harvesting white-tailed deer during the Michigan Special Youth Firearm White-tailed Deer Hunt.

My third hypothesis examines whether participants that achieve various levels of "flow" during youth firearm deer hunting experiences intend to continue hunting. My null hypothesis 3 (Ho3) states that there is no association between participants that experience various levels of "flow" and their intention to continue hunting. Whereas, the alternative hypothesis (H3) states that a positive relationship exists between participants' ability to achieve various levels of "flow" under hunting conditions and intention to continue hunting. Or, the alternative hypothesis (H3)

states that there is discriminating ability among functions related to the intention to continue hunting in the future.

## **Organization of Dissertation**

The remaining chapters of this dissertation are organized as follows: Chapter two provides background and context of hunting starting from a worldwide to local Michigan context. Chapter three is a review of the literature as it relates this study. Chapter four includes methods were used to conduct this research. Chapter five is a summary of the results, and Chapter six is a discussion of the results, limitations of this exploratory study, and suggested avenues of research for the future.

#### Summary

This study has the potential to inform researchers, state agencies, hunters, and others interested in continuing hunting as a wildlife management tool through theoretical, methodological, and practical contributions. From a theoretical perspective, this research will advance the framework of flow theory (Csikszentmihalyi, 1975) and the four-channel model of "flow" (Massimini & Carli, 1988) with a purposeful sample of youth as respondents in a hunting activity (Michigan's Special Youth Firearm White-tailed Deer Hunt, September 22 and 23, 2012).

Methodologically, no research exists that applies the constructs of the experience sampling method (ESM) to a specific hunting situation utilizing youth (12 to 16 years of age) as sample respondents. Application of ESM will inform researchers on further opportunities to benefit youth hunters through understanding perceived feelings, mood, and interest during a hunting experience. This study also provides a methodological approach that utilizes open-ended

questions about a youth's experience during the youth hunt, which has the potential to frame further survey research in the area of hunter recruitment from a state wildlife agency perspective.

This research provides a practical application by better understanding youth hunters and what factors may contribute to a young person's intention to continue hunting in the future. This research will inform state wildlife agencies in an effort to develop larger scale research to better understand recruitment needs of Michigan's youth hunting and non-hunting populations.





Figure 1.1. Theoretical model of "Flow" and non-flow constructs in youth hunting experiences.

#### **CHAPTER 2**

## **BACKGROUND AND CONTEXT**

#### **Examining Recreational, Subsistence and Commercial Hunting**

Recreational and subsistence hunting are important for populations around the world (Cordain et al., 2000; Fortier, 2009; Kerr & Woods, 2010; Kümpel, Milner-Gulland, Cowlishaw, & Rowcliffe 2010; Lamprey & Mugisha, 2009; Peloquin & Berkes, 2009; Parry, Barlow, & Peres, 2009; Mahoney, 2009; Mazzullo, 2010; McGee, 2010; Minzenberg & Wallace, 2011; Prayaga, Rolfe, & Stoeckl, 2010; Sasaki, 2010; Sharp & Wollscheid, 2009; World Forum on the Future of Sport Shooting Activities, 2010). Recreational hunting exists throughout the world and continues to thrive in areas including Europe, Oceania, North America, and in certain regions of South America (Kerr & Woods, 2010; Mahoney, 2009; Prayaga et al., 2010; Sharp & Wollscheid, 2009). Subsistence hunting still exists and is found primarily in rural regions of Africa (Kümpel et al., 2010), South America (Minzenberg & Wallace, 2011; Parry et al., 2009) and in the circumpolar latitudes of Europe, North America and Asia (Fortier, 2009; Mazzullo, 2010; McGee, 2010; Peloquin & Berkes, 2009).

This chapter is organized to provide the reader with: (1) an overview of the literature related to hunting as a recreational, subsistence, and commercial activity; and (2) a synthesis of literature regarding the use of the North American Model for Wildlife Conservation (Geist, 2006), including a definition, as well as current limitations, implications and challenges of using the North American Model for Wildlife Conservation (NAMWC) as the framework for management of wildlife throughout North America.

#### Worldwide Recreational Hunting

Non-consumptive (Chiutsi, Mukoroverwa, Karigambe, & Mudzengi, 2011; Duffus & Dearden, 1990; Fennell & Nowaczek, 2010; FHWAR; 2012) and consumptive recreation and tourism (Bauer & Herr, 2004; Kerr & Woods, 2010; Lamprey & Mugisha, 2009; Mahoney, 2009; Prayaga et al., 2010; Sharp & Wollscheid, 2009; WFSA, 2010) play an essential role in worldwide recreation. Conversely, consumptive recreation and tourism, for the purposes of this dissertation, may include a trip out back on a squirrel hunting adventure with a son or daughter to a complex and potentially expensive trip to hunt white-tailed deer in Saskatchewan. The latter trip can become quite costly as it may include the application and purchase of a passport, travel fees, and outfitter expenses. Nigel Leader-Williams (2009) further suggests that, "recreational hunting refers to hunting where the hunter or hunters pursue their quarry for recreation or pleasure" (p. 11). Perceived enjoyment of recreational hunting includes both social and cultural norms associated with the hunter and wildlife, even in instances when game is not harvested (Leader-Williams, 2009). Leader-Williams (2009) frames these norms by the social and cultural contexts that take place before during and after the hunt. Cultural examples include obtaining permission to the hunting area, travelling to the area, and seeking out the quarry. Additionally, Leader-Williams (2009) points out that the cultural norms are facets that determine when, what and how to hunt. Conversely, Leader-Williams (2009) provides context for the social aspects by referring to the social aspects of the hunt associated with the camaraderie prior to, in-situ, and after the hunting experience. These social and cultural norms of today may include travelling to and participating in an Upper Peninsula deer hunting camp the first week of the Michigan firearm deer season, having a family conversation about hunting stories past and present over a wild game dinner during Thanksgiving, or taking a youth hunting during Michigan's white-tailed

deer season. In many instances, social and cultural norms provide the most enjoyable and memorable features of the hunting experience (Petersen, 2010).

Recreational hunting is subject to considerable debate according to Leader-Williams (2009). Critics of recreational hunting are concerned that hunting is biologically unsustainable and pose issues related to ethics, animal welfare and animal rights (Loveridge, 2006; Regan 2001; Singer, 1993; Singer 1995). Examples cited include the inhumane treatment of animals through various hunting methods and the rights of animals to live without fear of being hunted. In contrast, Posewitz (1994) suggests that these ethical issues surrounding the hunt and hunting strengthen the ideals of hunters. In turn, this underscores the biological sustainability of hunting as a game management tool. Posewitz and others believe that hunting is one tool used to aid in the biological sustainability of wildlife (Boone and Crockett Club, 2008; Geist, 2006; Petersen, 2010; Posewitz, 1994). However, today's definition of hunting in the media is painting a portrait that goes against the tenets of the NAMWC. Commercial game ranches or preserves through "canned hunting events" and TV programming that portrays hunting in a context through examples of the consistent harvest of trophies or hunting experiences that occur within a 30minute "block" of time should concern many individuals that are strong supporters of the hunting movement.

Sharp and Wollscheid (2009) posits that recreational hunting can be divided into local hunting and hunting tourism. With regard to local hunting, individuals typically live on their property or land and organize their own hunting experiences; while paying fees that are appropriate for the local hunting experience (Sharp & Wollscheid, 2009). These fees may include travel, license fees and items essential for a particular hunting experience such as clothing, firearms or archery equipment, and ammunition. In hunting tourism, individuals travel

an unspecified distance from home and in many instances abroad, pay considerable sums of money, and include intermediary suppliers, outfitters, or travel agents that assist in various aspects of the hunting experience (Sharp & Wollscheid, 2009).

#### **Non-Consumptive Recreation and Leisure**

Non-consumptive practices may include wildlife-watching practices that are also known today as ecotourism (Chiutsi et al., 2011; Fennell & Nowaczek, 2010). Duffus and Dearden (1990) posited that an increasing number of people are generating substantial economic revenue by offering non-consumptive recreational activities, and according to the FHWAR (2012), 71.8 million people spent US \$55.0 billion to take part in non-consumptive recreational practices. Research by Davies, Hamman and Magome (2009) suggested that recreational hunting and non-consumptive recreational practices such as ecotourism or photo-tourism are mutually exclusive, yet can co-exist together where both types of activity can thrive. Though important, due to the scope of this chapter and dissertation, I will limit my discussion of non-consumptive recreational practices.

#### **Consumptive Recreation and Leisure**

Ten thousand years ago, hunting and fishing transformed from primarily a subsistence activity of people to more of a "recreational," male-centric activity found primarily in Europe (Ardrey, 1976; Geist, 2010; Koppedrayer, 2010; Scruton, 2010). Petersen (2010) proposed that:

To hunt, kill, and devour the flesh of creatures wild and free is not only the most natural possible exercise for body and spirit: it represents a palpable and significant, if only partial, return to our evolved animal heritage. Viewed in this light, honorable hunting is a spiritual sacrament, a humbling genuflection to our evolutionary design, genetic plan, and nutritional needs, as well as a sacred affirmation of our ancient blood-bond with the wildlings that for millions of years fed us, fed on us, and, in time, made us human. Thus were we created. (p. 15)
These recreational experiences were directly correlated to areas where higher human population existed (Figure 2.1). Many of the components that Bauer and Herr (2004) defined as consumptive wildlife tourism are staple characteristics of recreational hunting and fishing practices in North America today. According to Muth, Dick, and Blanchard (2001), consumptive hunting was defined as the harvesting of terrestrial wild game, which are eaten or used (see Chapter 1, Table 1.1).

The growth of what we would define today as traditional agriculture, allowed human populations to live and thrive in concentrated areas where large amounts of food (plant and animal) could be grown. Today it is no different. In fact, longitudinal research by Duda, Jones, and Criscione (2010) suggested that population centers are becoming larger, and fewer individuals are choosing rural lifestyles. Worldwide, many areas have become less dependent on subsistence hunting and are more likely to pursue consumptive and non-consumptive hunting and related opportunities as recreational and leisure-based endeavors (Bauer & Herr, 2004; Kerr & Woods, 2010; Lamprey & Mugisha, 2009; Mahoney, 2009; Prayaga et al., 2010; Sharp & Wollscheid, 2009; WFSA, 2010). According to Sharp and Wollscheid (2009), "Recreational hunting is a significant social and economic phenomenon where leisure activities are fully developed, principally in the richer countries of the world" (p. 25).

Outside of North America, limited opportunities to hunt non-native game species cause hunters to travel in search of exotic wildlife (Bauer & Herr, 2004). These limited opportunities are due to high costs, challenges of acquiring permits and licenses, and obtaining permission to



Worldwide Consumptive Wildlife Tourism

Figure 2.1. Worldwide Consumptive Wildlife Tourism. Adapted from Bauer and Herr (2004, p. 60). For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

hunt. For example, today European hunters travel to African destinations to hunt for exotic game due to high costs and licensing/permitting challenges associated with hunting in their country of origin. Bauer and Herr (2004) cited that participation in hunting today places many more demands on individuals. The authors cited that the typical hunter that is traveling to distant reaches is more apt hunt larger ungulate species (cervids and bovids). Bauer and Herr (2004) posited that the European expansion caused an increase in international hunting tourism. Affluent Europeans were more apt to discover remote places and explore first-hand, experiences confronting large game species (Bauer & Herr, 2004). A similar expansion began occurring in North America in the 1950s and 60s and is still strong today as many North American hunters choose to go on guided hunting experiences in other states, provinces, and even countries. Hofer (2002) and Bauer and Herr (2004) indicate regions of the world where the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) monitor's animals that are being exported from various regions of the globe (Table 2.1) based on legal hunting activities. It is important to understand CITES monitoring, as this is one of only a few data collection sources to make inferences about wildlife trafficking on a worldwide scale. It should be noted that trafficking of CITES wildlife is occurring in most regions with the exception of East/South East Asia and the Middle East where lack of continuity between national, regional and local agencies may make it challenging to manage wildlife populations for the purposes of hunting (Bauer & Herr, 2004; Nijman, 2010; Sodhi, Koh, Brook, & Ng, 2004). According to Hofer (2002), fragmentary governments, limited wildlife management, and limited interest by residents to create functional wildlife management entities were key factors in the lack of foreign hunting markets. European and North American hunters make up the majority of individuals hunting abroad. Locations most often traveled are Africa, Oceania (Australia and New Zealand)

Table 2.1. Worldwide hunting Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES). Adapted from Bauer and Herr (2004, pp. 62-63).

Hunting Location		
Major CITES Species	CITES Market Size	Related Literature
North America		
Moose, White-tailed Deer, Wapiti, Brown Bear, Black Bear, Puma	A very large market in particular in Canada. Dramatic increase in trophy trade from Canada to the US in particular Black Bear.	Festa-Bianchet, 2009; Hofer, 2002; Mahoney, 2009
South East Asia/Middle Asia		
Limited hunting opportunities due to variances in rules by region within countries and lack of regional cooperation.	Limited CITES market due to lack of consistent rules among national, governmental, regional and local authorizes.	Bauer & Herr, 2004; Frisina & Tareen, 2009; Hofer, 2002; Sodhi et al., 2004; Nijman, 2010
Europe/North Asia		
Red Deer, Wolf, Brown Bear, Chamois, Argali, Ibex, Roe Deer, Blue Sheep, Himalayan Thar, Marco-Polo Sheep, Siberian Ibex, Serau	A medium market with approx. 3200 CITES listed trophies imported to Europe and North America (1990-96).	Aebischer, 2009; Bauer & Herr, 2004; Hofer, 2002
Africa		
Lion, Buffalo, Elephant Hippopotamus, Eland, Impala, Sita tunga, Waterbuck, Hyena, Crocodile	Important income for Zambia, Tanzania, Zimbabwe, Botswana, Namibia and South Africa with approximately 31,000 CITES listed trophies introduced to North America and Europe (1990-1996).	Jones, 2009; Lamprey & Mugisha, 2009; Loveridge et al., 2009; WFSA, 2010
South America		
Jaguar, Red Deer (i), Tapir	Small market with only 880 CITES listed trophies introduced between 1990-1996. (Private land only)	Bauer & Herr, 2004; Hofer, 2002
Oceania		
Red Deer (i), Sambar Deer (i), Chamois (i), Himalayan Thar (i), Rusa Deer (i), Feral Pig (i), Red Fox (i) Banteng (i), Water Buffalo (i), Dromedary (i)	Overall a small market segment. On its own however a significant domestic industry in particular in New Zealand but also Australia.	Bauer & Herr, 2004; Hofer, 2002; Kerr & Woods, 2010; Prayaga et al., 2010

(i) – Introduced (Market size based on Hofer 2002, Bauer & Giles, 2002)

and North America (Canada) according to Hofer (2002) and Bauer and Herr (2004). Hofer (2002) indicates that CITES-listed exportations are most common from North America and Africa and to a lesser degree from Oceania, South America, and Europe/North Asia (Table 2.1). Ironically, much of the CITES-listed exportations are found in North America through the transfer of American black bear (*Ursus americanus*) from Canada to the United States (Table 2.1).

Nationally, consumptive recreational hunting is significant based on the metrics provided by the U.S. Fish and Wildlife Service et al. (FHWAR, 2012). The data indicated that in 2011, 90.1 million Americans (38%) spent US \$145.0 billion to hunt, fish and watch wildlife. Of these 37.4 million Americans participated in fishing, hunting or both activities in 2011. Hunting accounted for US \$34.0 billion, fishing for US \$41.8 billion, and wildlife watchers were responsible for US \$55.0 billion in 2011 (FHWAR, 2012). These data suggests that hunting, fishing and wildlife watching is an economically important component of the U.S. economy.

Considering that nationally, in 2011, it is estimated that 13.7 million Americans ages 16 and older hunted for big and small game (potential duplication of participants) in the U.S. according to a survey by the U.S. Fish and Wildlife Service et al. (FHWAR, 2012) or 6% of the total population. Given the national trend in hunters, we should be cognizant of the perceptions of various populations toward the activity of hunting. According to a study in 2008 by Responsive Management and The National Shooting Sports Foundation (RM/NSSF), 78% of Americans responded favorably to recreational hunting. However, research by Organ and Fritzell (2000), suggested that as a declining number of hunters take to the field there will likely be added impact of non-hunters to management of wildlife across the U.S. This is a function of fewer hunter stakeholders providing input (both financially and advisory) toward the

management of wildlife. The authors posited that this "swing" in population disposition toward hunting might restrict hunters toward more management and subsistence purposes (Organ & Fritzell, 2000). Further, changing patterns of values within hunter families due to changes in family composition (e.g., single-parent households) suggested that hunting may be in danger of further declining populations due to aspects related to urbanization, residential mobility (ability to travel to hunting destinations), and increasing education (Zinn, Manfredo & Barro, 2002).

# **Worldwide Subsistence Hunting**

Prior to the 20<sup>th</sup> Century, in fact before agriculture via the domestication of cereals, legumes, and animals, woodland populations of the world utilized hunting and fishing as their primary forms of food acquisition (Ardrey, 1976; Geist, 2010; Scruton, 2010). According to Cordain et al. (2000), the hunter-gatherer or subsistence way of life had been the primary means of dietary sustenance for all but the last ten thousand years. Subsistence hunting is still an important part of the hunting continuum. Worldwide, wild game is no longer the primary source of sustenance for most of the world's population. However, subsistence hunting is still a major source for the dietary needs in many rural regions of North America (Condon et al., 1995; Peloquin & Berkes, 2009; McGee, 2010), South America (Minzenberg & Wallace, 2011), Asia (Fortier, 2009), Northern Europe (Mazzullo, 2010) and Africa (Kümpel et al., 2010).

In North America, subsistence hunting lifestyles were and are still an important cultural and often, necessary form of dietary sustenance of Native Americans across the U.S. and Canada (Cleland, 1992; Condon et al. 1995; Peloquin & Berkes, 2009; McGee, 2010) and in many parts of Alaska (McGee, 2010). Implications of subsistence living include the potential for divisive social relationships and the political nature of living a subsistence lifestyle (McGee, 2010), however subsistence hunting still holds important cultural and religious significance to many

communities around these rural regions of North America (Condon, 1995; Peloquin & Berkes, 2009).

Peloquin and Berkes (2009) found that subsistence hunting was important to the residents of Lime Village, Alaska. In 2007, during data collection, the authors found that all Lime Village residents participated in subsistence activities and utilized the wild resources within and around Lime Village. The authors suggested that the use of subsistence hunting to harvest healthy game is meaningful to the framework of the native culture, religious beliefs, and health of community residents. The authors posited that increases in subsistence hunting are an encouraging sign for not only the future of subsistence lifestyles of rural Native Alaskans, but also the continuance of cultural and religious practices of various native cultures (Peloquin & Berkes, 2010).

In Michigan, early settlers and Native American populations relied heavily on wild fish and game for their dietary needs as a way to provide animal protein for families and community (Cleland, 1992). While on these excursions, hunters harvested a variety of game, however whitetailed deer were the favorite target due to the multi-use of deer in the form of meat for protein and the hide for clothing and bedding (Cleland, 1992). Many hunting activities were the center of community feasts. These social activities were held at a time when the celebration reflected on ancestors through a "renewal feast" (Cleland, 1992). The renewal feast was a social event that also included new fires being kindled, pipes being smoked, and singing and dancing that lasted the entire night (Cleland, 1992).

According to Cleland (1992), in the 1880s Michigan and other Great Lakes states began enforcing hunting and fishing laws. The federal government, which at one time recognized treaties of Native Americans, advised the Native population to abide by state law. Unfortunately, according to Cleland (1992), this was due to the gross overharvest of fish and wildlife by non-

Native populations of hunters and fishermen. The depression of the 1920's and 30's brought additional tough times on Native American populations due to increased unemployment in and around Native American tribal lands (Cleland, 1992). In fact, according to Cleland (1992), at the printing of his book, 80% of the nearly 62,000 Native Americans live in Michigan cities. However, a key ruling in 1976 in *People v Le Blanc* provided Michigan Native Americans the right to once again fish unregulated and eventually hunt in a subsistence way based on the intended spirit of the Treaty of 1836. In another case of *Lac Courte Oreille v. Wisconsin, or the Voight Case,* The Lake Superior Chippewa Bands of northern Wisconsin won the right to hunt and fish over lands and waters ceded during the treaties of 1837 and 1842 as long as these areas were under public ownership (Cleland, 1992). As of 1992, 20% of remaining Native Americans that inhabited rural areas of the Upper Peninsula and Michigan's northern Lower Peninsula, many still utilize subsistence hunting and fishing methods to supplement their dietary needs (Cleland, 1992).

#### Worldwide Commercial Hunting

Much of the commercial hunting that ensues worldwide occurs on the continents of Africa (Humle & Kormos, 2011; Kümpel et al., 2010; Wall & Child, 2009) and South America (Da Silveira & Thorbjarnarson, 1999). In certain instances, animals are either hunted legally or poached illegally and sold for protein consumption, traditional medicinal purposes or trade of animal parts such as ivory for decorative purposes or antlers and bone that are ground up and used as an aphrodisiac (Humle & Kormos, 2011). Commercial trade is not only a local issue from the country of harvest, but also important from the demand aspects of countries that desire these wildlife commodities. Additionally, the commercial trade of bushmeat from harvest in rural areas to sell in urban areas of Africa is substantial (van Vleit, Nasi, & Taber, 2011). Van Vliet et

al., (2011) cited that although commercial harvest in certain species (larger mammals) has been found to be unsustainable through the harvest of larger mammals for their meat, horns or antlers, tusks, furs and skins. In many instances the political and cultural complexities of commercial wildlife harvest and trade outweigh the ecological aspects given the ever-increasing urban populations in regions of West and Central Africa (Kümpel et al., 2010; Lamprey & Mugisha, 2009; van Vliet, 2011). Biodiversity and international wildlife trade is an essential component to the commercial industry. Although beyond the scope of this dissertation, it should be noted that illegal international wildlife trade in Southeast Asia is economically lucrative for many participants while being an unsustainable practice that threatens the biodiversity of the region (McNeely, 2009; Nijman, 2010). Literature on challenges of worldwide commercial harvest of wildlife exists at various levels worldwide, however due to the scope of this dissertation I will conclude my discussion on this topic.

Wall and Child (2009), cited that successful worldwide conservation-hunting programs are those that contribute to the viability of various wildlife species through ecosystem biodiversity and use of sustainable harvests in recreational hunting situations. The authors posited that these programs would generate an economic benefit that can, in turn be used to create relevant conservation programs for that region (Wall & Child, 2009).

# The North American Model for Wildlife Conservation (NAMWC)

Much of the historical and current success of hunting and wildlife populations is credited to the North American Model for Wildlife Conservation (Geist 2006; Mahoney, 2009). Currently and traditionally (19<sup>th</sup> and 20<sup>th</sup> centuries), the conservation and management of wildlife in the United States and Canada has been theoretically based on the North American Model of Wildlife Conservation (NAMWC) (Geist, 2006; Mahoney, 2009). Though theoretical, the NAMWC has

stood the test of time by providing the basis for the sustainability of renewable natural resources that is unparalleled worldwide (Geist, Mahoney & Organ, 2001). However, research also suggests that due to changing stakeholder beliefs about wildlife management, the NAMWC may need to reflect the "Democracy of Hunting" as populations change (Geist, 2006; Jacobson & Decker, 2006; Organ & Fritzell, 2000; Zinn, Manfredo, & Barro, 2002). As the transformation of our hunting populations continues to occur, understanding the dynamics of the NAMWC along with the needs of wildlife management agencies will inform future hunting populations about the importance of wildlife management in Michigan and nationwide.

### **Defining the NAMWC**

The North American Model of Wildlife Conservation provides a framework for hunting through emphasis of seven foundational tenets (Mahoney, 2009). These "pillars" or core tenets provide a framework for wildlife management (Table 2.2). By following these core tenets (Table 2.2), wildlife managers can provide recreational activity and manage wildlife of North America in a way that is fair and equitable to the population of sportsmen and women that pay for this management through the Pittman-Robertson Act (1937). However, one of the implications of the Pittman-Robertson (P-R) Act and the NAMWC are that the two are distinct and not necessarily dependent on one another. For example the tenets of the NAMWC are not funded by P-R dollars, however hunters pay for licenses, firearms and ammunition, which provide federal monies for states to provide hunting opportunities that are the tenets of the NAMWC (Table 2.2).

The Federal Aid in Wildlife Restoration Act (16 U.S.C. 669-669i; 50 Stat. 917) also referred to the "Pittman-Robertson Act" was signed into law on September 2, 1937. The Act has been amended several times, and provides federal aid to States for the management and

	NAMWC (Geist, 2009)	Definition
1.	Wildlife as a public trust	Wildlife is not owned by any one person but is entrusted to all people and managed through governmental entities.
2.	Elimination of markets for wildlife	Elimination of the trafficking and sale of wildlife such as meat, furs, bones, antlers, etc. for the purposes of compensation.
3.	Allocation of wildlife by law	Wildlife is managed by federal and state government agencies through laws. Public input is an integral process of the management of wildlife.
4.	Legitimate harvest of wildlife	Wildlife is harvested in legitimate ways using ethical means. Furthermore, all parts of animals would be used for consumptive or other purposes.
5.	Wildlife is considered as an international resource	Certain species of wildlife transcend international boundaries (ex. migratory bird species). Cooperative management among international entities is essential to provide proper management of a species.
6.	Science as a tool to discharge wildlife policy	Concepts of science should be the determining factor in wildlife management.
7.	Democracy of Hunting	Hunting is considered a recreational activity where ALL citizens have an opportunity to participate in hunting activities. Examples include hunting access to state, federal and provincial land or opportunities to take part in Hunter Education courses to learn about hunting and become certified to purchase a hunting license.

Table 2.2. Tenets of the North American Model of Wildlife Conservation.

restoration of wildlife. Funds from an 11% excise tax on sporting arms, ammunition, archery bows and arrows [Internal Revenue Code of 1954, sec. 4161(b)] are appropriated to the Secretary

of the Interior and apportioned to States on a formula basis paying up to 75% of the cost for approved projects. Project activities include acquisition and improvement of wildlife habitat, introduction of wildlife into suitable habitat, research into wildlife problems, surveys and inventories of wildlife problems, acquisition and development of access facilities for public use, and Hunter Education programs, including construction and operation of public target ranges (U.S. Fish and Wildlife Service-Southeast Region, 2010).

# Limitations and Implications of the NAMWC

The tenets of the NAMWC are often thought of in the context of hunting followed by the words "and fishing." One typically thinks of hunting and fishing and have been synonymous with each other and the two are typically related to each other in the context of recreational and leisure activities that promote the outdoors, and wild fish and game (Bauer & Herr, 2004). Does the NAMWC promote fishing and or angling as a component of the model? Literature by key authors and proponents of the model suggest that angling is a component and can be related to the "pillars" or core tenets of the model (Geist 2006; Mahoney, 2009). However, this same literature lacks concrete examples where fishing and or angling are associated with the NAMWC. Clearly, one limitation and potential implication of the NAMWC and the relationship to fishing is defined in tenet two that states, "elimination of markets for wildlife" (Geist, 2006). Although the marketing and sale of wildlife in North America is illegal, the same does not hold true for the commercial fishing industry around the U.S. and Canada. Second, tenet seven relates to the democracy of hunting (Geist, 2006). This concept implies the use of "sport" hunting that includes the ethical use of "fair chase" methods (Geist, 2006). The Fair Chase statement was developed based on early founders (1890s) of the Boone and Crockett Club as "the ethical, sportsmanlike, lawful pursuit, and taking of any free-ranging wild, native North American big

game animal in a manner that does not give the hunter an improper advantage over such animal" (Boone and Crockett Club, "Fair Chase Statement", 2008).

Clearly, there is differentiation between legislation that support the various financial and managerial aspects of recreational hunting (The Lacey Act, 1900; Migratory Bird Treaty Act, 1918; The Migratory Bird Conservation Act, 1929; The Duck Stamp Act, 1934; Pittman-Robertson, 1937) fishing (Dingell-Johnson Act, 1950; Marine Mammal Protection Act, 1972) and a combination of fishing and hunting as the precursor of the of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Does this mean there should be differentiation among fish and game when defining the model as a tool to manage natural resources?

A major implication of the North American Model of Wildlife Conservation includes the increased fragmentation of private land holding across North America according to Mahoney (2009). Butler et al. (2005) cite that in excess of 70% of land in the U.S. is privately owned and in Canada the percentage is increasing as well. Increasing fragmentation of private holdings of land results in decreased opportunities for hunters. This fragmentation has been attributed to additional generations of families and hence more family members owning property rights to a finite number of acres. Landowner attitudes will have a major impact on the NAMWC and with land continuing to be subdivided into smaller parcels this also means increasing the number of landowners, which will inherently create variations in attitudes toward hunters and hunting. Additionally, substantial market fluctuations in forestry and agricultural products have made revenue from recreational hunting on private land a desirable benefit for private landowners (Mahoney, 2009).

Contrary to Mahoney (2009), Michigan has increasing opportunities for intermediate

outdoor recreation with regard to public land. According to the Michigan Statewide Outdoor Comprehensive Recreation Plan (SCORP) 2008-2012, public outdoor recreational land is approximately 4.5 million acres (12% of the state). Additionally, The Michigan Natural Resources Trust Fund (MNRTF) utilizes a grant process to expand state recreational lands on an annual basis. According to the Michigan Department of Natural Resources (MDNR, 2001), "The Michigan Natural Resources Trust Fund (MNRTF) began as the 'Kammer Recreational Land Trust Fund Act of 1976' via P.A. 204 of 1976. Act 204 created the Michigan Land Trust Fund (MLTF) program to provide a source of funding for the public acquisition of lands for resource protection and public outdoor recreation. Funding was derived from royalties on the sale and lease of State-owned mineral rights." Retrieved from www.michigan.gov/dnr/0,1607,7-153-39002 16791-39513--,00.html.

Two recent articles in *The Wildlife Professional* have scrutinized the North American Model of Wildlife Conservation. Nelson, Vucetich, Paquet and Bump (2011) suggested that a broader interpretation of the model is needed due to a misguided prescription for the future of conservation. Nelson et al. (2011) also contended that hunting may not play as central of a role as what it had once played in the future of wildlife conservation. In another article by Dratch and Kahn (2011), the authors suggested that populations of animals are getting too close to people and that this is a potential implication to the tenets of The North American Model of Wildlife Conservation.

An ancillary to increased privatization of recreational hunting is the use of "pay-to-hunt" facilities located throughout North America also known as game preserves (Figure 2.1). Though a good economic stimulant in rural areas where the activity typically occurs (Swan, 1995), attitudes by non-hunters may not be conducive to promoting "fair chase" recreational hunting.

Instead of hunting purely for food, hunters pay for the thrill of killing exotic animals or trophies. Privatization of hunting opportunities using "pay-to-hunt" operations also pose disease and invasive species implications to "free-ranging" wildlife populations (Vercauteren, LaVelle, Seward, Fischer, & Phillips, 2007). Additionally, Mahoney (2009) cited that the genetic manipulation of fenced wildlife increases the trophy hunting potential and hence the economic gain for many private landowners. For example, many wildlife preserves are utilizing artificial insemination to create abnormally large antlered animals in an effort to produce an animal that is more desirable to harvest by paying individuals. Additionally, another example where private wildlife ownership had been detrimental to the "public trust" tenet is here in Michigan where feral pigs that were once inhabitants in game ranches or preserves around the state have escaped or been released and are now roaming both private and public lands throughout Michigan (Teget, Mayer, Dunlap & Ditchkoff, 2011). Feral pigs are considered a threat to agriculture as well as to the general population. Examples of threats to the population may include car/swine collisions, ecosystem degradation, or potential disease vectors. Currently, legislation regarding feral pigs is in place that lists these animals as invasive species in the State of Michigan. Lawmakers and ranch/preserve owners disagree about whether or not their importation should be outlawed, however, this is a problem according to Teget et al. (2011). Hunting these animals under confined conditions could be considered recreational activity by Ibrahim and Cordes' (2002) definition, however, the implications of perceptions by hunters and non-hunters alike may not promote the desired results of being true outdoor recreation by many. Going directly against the theoretical constructs of the NAMWC, Peterle, (1977) and Petersen (2010) suggested that a European system of hunting (similar to pay-to-hunt) may be, in certain instances, an effective way of promoting "the hunt" or hunting opportunities for wildlife species that may not be found

in current locations or giving beginning hunters a "successful" experience, which may, in turn create a future hunter. However, Knox (2011) believed that many of the current attitudes through pay-to-hunt and the deer hunting media have given cannon fodder to anti-hunters and antihunting organizations. The promotion of recreational hunting through these "pay-to-hunt" approaches would not be popular among our founding fathers of wildlife management and conservation and those that support and promote the tenets of the NAMWC.

According to Mahoney (2009), declining hunter numbers nationally provides the second challenge to the current model for wildlife conservation. Of the approximately 6% of the population that hunts annually, according to the U.S. Fish and Wildlife Service (FHWAR, 2012), the percentage of people that are continuing to hunt are declining as a reflection of the overall U.S. population (RM/NSSF, 2008). This declining trend in hunter numbers was also similar across Canada (Mahoney, 2009). The physical (written, verbal, advocacy) and financial support of hunters in North America is the current impetus for successful wildlife conservation in many regions (Mahoney, 2009), but how long can the current structure of the NAMWC survive based on the challenges to conservation in North America? Jacobson and Decker (2006) suggested that there is a need for the public and state wildlife agencies to consider their role as change agents for the future. The authors indicated that increasing pressure to reform state wildlife management due to declining hunter numbers and increasing numbers of nontraditional stakeholders (non-hunters) make implementation and access toward a comprehensive decision-making process important to the future of wildlife management nationally (Jacobson & Decker, 2006).

#### An Amendment to the NAMWC

The Association for Fish and Wildlife Agencies, in an effort to strengthen conservation education, has developed the Core Concepts for Conservation Education. The goal is to align the

Core Concepts with the current NAMWC by integrating components in order to achieve the AFWA Strategic Plan through an informed and involved citizenry. Integration of hunting as a recreational activity into conservation education is not only appropriate, but also imperative to the future of hunting and wildlife management. Jacobson and Decker (2006) cited that this change in philosophy by hunters, nontraditional stakeholders of wildlife management, and state and federal agencies is needed and holds much promise toward advancing decision-making processes. The Core Concepts of Conservation Education provide a definition that inform the citizenry (hunters, nontraditional stakeholders, and state agencies) while still utilizing the framework of the NAMWC through:

- (I) understanding the value of our fish and wildlife resources as a public trust;
- (II) appreciating that conservation and management of terrestrial and water resources are essential to sustaining fish and wildlife, the outdoor landscape, and the quality of our lives;
- (III) understanding and actively participating in the stewardship and support of our natural resources;
- (IV) understanding and accepting and/or lawfully participating in hunting, fishing, trapping, boating, wildlife watching, shooting sports, and other types of resource-related outdoor recreation; and
- (V) understanding and actively supporting funding for fish and wildlife conservation. Retrieved from http://www.fishwildlife.org/index.php?section=conservation\_education&a ctivator=25.

The AFWA definition of conservation education is similarly aligned with the North American Model of Wildlife Conservation (Geist, 2006). For this reason, characteristics of conservation education can be differentiated from the definitions of environmental and outdoor education (Table 2.3). Further, the population of North America can appreciate and understand all aspects related to natural resources whether participating in hunting, fishing, and wildlife watching or observing individuals taking part in these activities using the platform of recreational hunting

NAMWC (Geist, 2009)	AFWA Framework (AFWA 2011)	NAMWC Definition
Wildlife as a public trust	Understanding the value of our fish and wildlife resources as a public trust.	Wildlife is not owned by any one person but is entrusted to all people and managed through governmental entities.
Elimination of markets for wildlife		Elimination of the trafficking and sale of wildlife such as meat, furs, bones, antlers, etc. for the purposes of compensation.
Allocation of wildlife by law	Understanding and accepting lawful participation in hunting, fishing, trapping, boating, wildlife watching, shooting sports, etc.	Wildlife is managed by federal and state government agencies through laws. Public input is an integral process of the management of wildlife.
Legitimate harvest of wildlife	Understanding and actively supporting funding for fish and wildlife conservation.	Wildlife is harvested in legitimate ways using ethical means. Furthermore, all parts of animals would be used for consumptive or other purposes.
Wildlife considered as international resource		Certain species of wildlife transcend international boundaries (ex. migratory bird species). Cooperative management among international entities is essential to provide proper management of a species.
Science as a tool to discharge wildlife policy	Appreciating that conservation and mgt. of terrestrial and water resources are essential to sustaining fish and wildlife, the outdoor landscape, and the quality of our lives.	Concepts of science should be the determining factor in wildlife management.
Democracy of Hunting	Understanding and actively participating in the stewardship and support of our natural resources.	Hunting is a recreational activity where ALL citizens have an opportunity to participate in hunting activities.

Table 2.3. Comparison between the North American Model of Wildlife Conservation and AFWA framework.

from The North American Model of Wildlife Conservation (Geist, 2006). Additionally, we can utilize the definitional feature from AFWA regarding conservation education to provide and enhance the instructional framework of Michigan Hunter Education in an effort to recruit more hunters.

### The Hunter of Today

One of the most important features of the sportsperson of today is the idea that hunting takes place using the "code of the sportsman" (Organ, Muth, Dizard, Williamson, & Decker, 1998; Roggenbuck, 2004). The "code of the sportsman" can be summarized in the following excerpt (Organ et al., 1998, pp. 529-530) as one who hunts game: 1) does so primarily for the pursuit of chase; 2) affords game a "sporting" chance (fair chase); 3) seeks knowledge of nature and the habits of animals; 4) derives no financial profit from game killed; 5) will inflict no unnecessary pain or suffering on game; and 6) will not waste any game that is killed.

These core components of a sportsperson (hunter) of today are important to underscore in today's climate toward hunting. Organ et al. (1998) cited the importance of recreational hunting as a tool to supplement dietary needs is more generally supported than the idea of "sport" hunting where animals are not fully utilized for their meat, fur, antlers and other appropriate components. Further, Organ et al. (1998) emphasized that the term "sport" hunting may not provide a positive approval from non-hunter stakeholders. Therefore it is critical that hunting, though recreational means, becomes synonymous with terms related to the utilitarian nature of harvesting and utilizing game as a food source. However, Organ et al. (1998) are quick to point out that prior to the management of our wildlife resources, utilitarianism was a standard term used as many animals were harvested and sold commercially, which led to the near extirpation of white-tailed deer and wild turkeys across much of North America. The authors suggested that if

the sportsman's code is to continue to survive in an era where urban populations and negative perceptions toward recreational hunting continue to increase, a proactive approach must be taken (Organ et al., 1998). Organ et al. (1998) suggested that hunting and trapping publications must take the "high ground" on ethical issues with regard to the sportsman's code. This "high ground" is where hunters strictly adhering to the tenets that underscore the sportsman's code (Organ et al., 1998). An opportunity exists for these issues to be addressed within the constructs of Hunter Education and the potential to recruit new hunters that have appropriate experiences using the sportsman's code.

### The Michigan Hunter

According to the Michigan Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2008 to 2012 published by the Michigan Department of Natural Resources (MDNR), in 2006, distinct recreational Michigan hunters totaled 814,643. These numbers were slightly higher than 2005, however have been lower than any year since 1980 for hunters (MDNR, 2008).

A variety of hunting and human dimensions literature has cited that as the population increases, the overall percentage of hunters in the population is decreasing (Adams, Brown, & Higginbotham, 2004; Duda et al., 2010; Enck et al., 2000; Responsive Management, 2006; Responsive Management/National Shooting Sports Foundation, 2008; Riley et al., 2003; Ryan & Shaw, 2011; Winkler & Warnke, 2012). In the case of hunting, a high percentage of the North American population in the late 1800's hunted as a source of dietary sustenance for self and family. However, with more traditional agriculture and increases in domesticated livestock, individuals and family have placed less reliance on hunting. This decrease in reliance and reduction in number of hunters in the field may have the potential to cause an increase in wildlife populations (Enck et al., 2000; Riley et al., 2003; Winkler & Warnke, 2012). These wildlife

population increases in areas of higher human population also have the potential to increase wildlife/car collisions, disease potential and negative ecosystem impacts. One potential way to keep wildlife populations in "check" is by increasing the number of hunters that go to the field (Enck et al., 2000). Two factors are critical to understanding the dynamics of hunting and hunters. First, changes in the societal characteristics of U.S. populations including: a higher percentage of population in urbanized areas, increased activity commitment for the same amount of available time and an aging population are all cited as contributing factors in hunter population reductions (Dizard, 2003; Duda et al., 1995; Mehmood; 2003; Riley et al., 2003; Ryan & Shaw, 2011; Winkler & Warnke, 2012). Second, As Petersen (2010) states in his book, *Heartsblood: Hunting, Spirituality, and Wildness in America*:

MOST MODERN HUNTERS, good and bad, just want to hunt-not explore and debate why they do it and how they do it and what others think of them for it. Yet today, no thoughtful hunter can afford to just hunt. In order to defend what we do to ourselves, our families, our friends, and, especially, to an increasingly urbanized, denatured, domesticated, and virtualized populace-in order to improve hunting ethics and invite and inspire tomorrow's hunters and assure that hunting has a tomorrow...for all of these reasons and more, hunters *must* ask themselves: Why? (p. 8)

In Michigan, between 2003 and 2005, 92% of license purchases were by males, however

participation by females has been increasing in recent years according to Frawley (2006).

Further, according to Frawley (2006), white-tailed deer hunters made up the largest percentage

of overall license purchases (78%), with small game hunting decreasing in popularity.

Recreational hunter retention is a concern not only nationally (RM/NSSF, 2008; Duda et al.,

2010) but also locally in the State of Michigan (Frawley, 2006). According to Duda et al. (2010),

the number of hunters leaving the activity due to waning interest, age, and changes in familial or

work obligations are not being made up through youth interested in becoming future hunters.

No recruitment and retention discussion would be complete without addressing challenges related to hunter churn rates from a national perspective. Hunter churn rates are defined as those hunters that do not purchase hunting licenses on a yearly basis according to the National Shooting Sports Foundation (NSSF, 2009). Churn rates are important to the overall understanding of recruitment and retention of recreational hunters due to the competitiveness for time with other activities. Nationally, in a report by the NSSF (2009), 78% of resident hunters and 49% of nonresident hunters who purchased a license in one year could be expected to purchase a license the following year. National resident and nonresident data suggests that churn rates are an important consideration in the overall understanding of hunters that go to the field and how avidly they do so (Table 2.4). The data suggested that nearly 26% of resident hunters and 58% of nonresident hunters purchased licenses 1 year out of every 5 (Table 2.4). Further,

Hunters Purchased a License	National Residents	National Nonresidents
1 out of every 5 years	26%	58%
2 out of every 5 years	15%	19%
3 out of every 5 years	12%	10%
4 out of every 5 years	12%	7%
5 out of every 5 years	35%	7%

Table 2.4. National Resident and Nonresident Hunter Churn, Adapted from NSSF, 2009.

NSSF (2009) metrics included overall percentage decreases for resident and non-resident hunters for years two through five in all instances except for national residents that purchase hunting licenses for five years consecutively (35%). Churn rates are an important feature in the overall

context of recruitment and retention as this may suggest that hunter dynamics are changing across the U.S. (Enck et al., 2000), Organ and Fritzell (2000), and Zinn et al. (2002), suggest dynamics that may be indicative of these changes in the future of recruitment and retention efforts nationwide. The increased urbanization of our population, ability to connect with hunting opportunities (travel/access), and educational implication provide an opportunity to challenge the current thinking about hunter recruitment and retention (Organ and Fritzell, 2000; Zinn et al., 2002). In Michigan between 2003 and 2004, 78.4 % of hunters purchased white-tailed deer licenses during consecutive years. Between 2004 and 2005 only 77.2 % of hunters purchased deer hunting licenses consecutive years, a decrease of 1.2 % (Frawley, 2006).

Much of the current literature suggests that mentorship is the most important way to create new hunters (Posewitz, 1994; RM/NSSF, 2008; Ryan & Shaw, 2011). Mentorship in hunting can be defined as the encouragement of one hunter to another prospective hunter through transfer of knowledge and advocacy for the activity, in this case hunting. According to RM/NSSF (2008), mentorship has been broadly defined into two types of experiences. The first type of mentorship occurs through hunting families (80%) and the second type occurs when individuals in their early twenties are introduced to hunting through friends or spousal relationships with family (20%). Pass it on, Youth Outdoors Skills Camps, Conservation Leaders for Tomorrow, and Becoming an Outdoors Woman are current mentoring and educational programs that provide important inclusionary opportunities for social aspects related to hunting (Ryan & Shaw, 2011). According to RM/NSSF (2008) the most effective way to become introduced to hunting is through family, therefore the challenge is to reach outside of family constructs to provide mentorship opportunities for youth to become future hunters.

Education is the second component that has been identified as a critical area for the recruitment and retention of future hunters (Posewitz, 1994; Duda et al., 1995; Enck et al., 2000; Dizard, 2003; Mehmood, 2003; RM/NSSF, 2008; Ryan & Shaw, 2011). Enck et al. (2000) suggests that non-hunters receiving recreational and cultural benefits such as understanding why hunters hunt, the significance of hunting to families, and the value of hunting as a management tool may be 3 times greater than the current population of U.S. hunters.

#### **CHAPTER 3**

### LITERATURE REVIEW

## **Flow Theory**

The theoretical basis of this study is informed through the framework of flow theory (Csikszentmihalyi, 1975). The goal of defining "flow" is to understand enjoyment as an ongoing process that provides rewarding experiences (Csikszentmihalyi, 1975). However, to understand "flow" we must first understand the autotelic experience. Autotelic is a word derived from the Greek language where auto=self and telos=goal or purpose. We can further refine our definition of the autotelic experience as having feelings of joy from the intrinsic rewards of an activity, and not for the extrinsic reward such as a trophy or monetary compensation (Csikszentmihalyi, 1975). You do something because you simply enjoy it! This chapter is organized to provide the reader with: (1) an overview of flow theory; (2) a synthesis of "flow" literature related to outdoor recreation and youth; and (3) the need for this research through gaps in the literature.

Csikszentmihalyi (1975) confirmed his theory that intrinsic rewards were far more enjoyable than extrinsic rewards. Csikszentmihalyi (1975) examined the experience of rock climbing in a recreational context, where "flow" was explained as a dynamic state, a merging of action and awareness, and as loss of self-consciousness, hence creating an optimal experience. Additionally, Csikszentmihalyi (1975) found that intrinsic motivation gave participants a sense of discovery, exploration, and problem solution, hence a feeling of challenge. Further, this autotelic experience created an uncertainty that the participant was potentially able to control by what he or she was accomplishing (Csikszentmihalyi, 1975). Consequently, an individual having an autotelic experience would therefore be unable to experience anxiety or exhibit boredom from

that activity. In fact, a person can make use of any skills he or she has available in a variety of challenging situations.

After defining the autotelic experience, Csikszentmihalyi (1975) began conceptualizing his work on, "the holistic sensation that people feel when they act with total involvement" (p. 36), or, in lay terms "flow." Athletics are a good example of experiences where "flow" occurs on a regular basis and are characterized by peaks and valleys of "happiness," "boredom," and "anxiety." Further, it is impossible to maintain emotional continuity for any length of time in a "flow" event, although this is the goal (Csikszentmihalyi, 1975). Csikszentmihalyi (1975) suggested that the goal is not to look for utopia, which is a peak, but to stay in the "flow" as long as possible.

In a true one-to-one "flow" experience, an individual is in "flow" when the level of challenge in an activity by an individual is equal to the skill level of that activity by the same person. If the challenge and skill level are equal, then the person is in "flow" (Figure 3.1). If the challenge is greater than the skill level for that person in the activity, then the individual will experience a sense of "anxiety." However, if the challenge is less than the skill level for the same person and activity, then the individual will exhibit "boredom."

Csikszentmihalyi and Larson (1987) suggest that advantages of studying "flow" include the ability to (1) engage scientists in laboratory research by asking participants to evoke feelings, behavior and imagery that are not typically experienced in real-life situations; (2) implement quality-of-life studies, through measurement of complex phenomena that are often temporally or spatially represented; (3) be a data gathering source outside the context of the life-situation; and (4) evaluate time-budgeting, which is often present in unclear links between behavior and psychological states. Scollon et al. (2003) posited that the Experience Sampling Method (ESM)

has been successful at (1) allowing researchers to understand contingencies of behavior; (2) removing the respondent from the lab and placing the participant in real-life situations; (3) allowing research of processes that are characteristic of internal behavior; (4) decreasing memory and recall bias by use of heuristics; and (5) decreasing the need for multiple methods to study psychological phenomena.

An adapted version of the single channel model (Figure 3.1) provides more defined boundaries of a "flow" experience through the use of the four-channel model (Figure 3.2). The four-channel model is based on the following assumptions: (1) "flow" occurs when perceived challenge and skill are above an individual's personal average; (2) "anxiety" occurs when perceived challenge is greater than skill; (3) "boredom" occurs when perceived skills exceeds challenge; and (4) "apathy" occurs when both perceived challenge and skill are below the personal average (Csikszentmihalyi, 1997; Csikszentmihalyi & Csikszentmihalyi, 1988; Massimini & Carli, 1988) (Figure 3.2).

"Flow" was developed out of the study of autotelic and optimal experiences in the mid-1970s. Methodologically, "flow" can be measured using the ESM, a method in which participants are signaled and asked to complete a survey instrument while involved in an activity. Respondents fill out questions related to interest level, mood and challenge while participants are involved in the activity. Additionally, in some studies, survey participant's fill out the surveys 10-12 times during the course of a day over a one-week period of time (Hektner, Schmidt, & Csikszentmihalyi, 2007). Following the experience, survey responses are tabulated and analyzed to determine if "flow" can be measured.

Measuring "flow" and the autotelic experience are notions that methodologically are very different from other forms of quantitative/qualitative social science research. In, fact the

Single Channel "Flow" Model



Figure 3.1. Single channel "flow" model adapted from Csikszentmihalyi (1975). For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.



Figure 3.2. The four-channel flow model applied to ESM. The origin for the optimal experience is the individual average of challenge and skills. Only when an individual is above that point does flow begin (Adapted from Csikszentmihalyi & Csikzentmihalyi, 1988; Massimini & Carli, 1988).

Experience Sampling Methodology (ESM) in itself is unique in that it utilizes survey questionnaire techniques with additional mixed-mode applications to measure "flow." The one caveat to this methodology is that these questionnaires are time dependent. Experience Sampling Method questionnaires are filled out by respondents that are dependent on the activity being measured.

Csikszentmihalyi characterized learning at its optimum to be intrinsically based. Csikszentmihalyi (1975) suggested that optimal learning conditions are found in an environment where students are motivated to learn because they have an internal desire to understand. This internal desire is based on the instructional practices that give students the "Drive" to learn (Pink, 2011).

Flow is often reported in the context of physical activities such as hiking (Wöran & Arnberger, 2012), mountain climbing (Bassi & Delle Fave, 2010; Csikszentmihalyi, 1975), marathon running (Schüler & Brunner, 2009), walking (Decloe et al., 2009), and kayaking and rafting (Jones et al., 2000; McIntyre & Roggenbuck, 1998). Additionally, flow has been applied to athletics (Chavez, 2008; Jackson & Marsh, 1996), academics (Bassi & Delle Fave, 2004), and comparing work and leisure (Delle Fave & Massimini, 2003). However, gaps in the research exist that measure "flow" with respect to youth during outdoor recreation hunting experiences. Motivational research by Csikszentmihalyi (1975, 1997) and Lefevre (1988) suggested that individuals learn better and have a desire to continue what they are doing under conditions where participants are having "flow" experiences. And this "flow" occurs when the perceived challenge and skill needed are above an individual's personal average (Csikszentmihalyi, 1990). Therefore, hunting enthusiasts with skill and challenge levels that are above their own average are likely to achieve a state of "flow" and hence learn and desire to continue hunting. If we can measure

where, when, why, and how youth are exhibiting "flow" within an outdoor recreation context (e.g., white-tailed deer hunting), we can begin to understand under what conditions youth enjoy and have intrinsically satisfying experiences in the context of hunting.

# "Flow" Literature in the Context of Outdoor Recreation

The range of "flow" literature within the context of outdoor recreation is broad. Research by McIntyre and Roggenbuck (1998) studied group and family recreation while applying flow theory. At the opposite end of the spectrum, Jones et al. (2000) applied flow theory from an individual recreation perspective (kayaking). Finally, Jackson and Marsh (1996) and Decloe et al. (2009) implemented methodology to determine "flow" based on co-participation and individual recreational physical activity. In much of the literature with a "flow" and outdoor recreation theme, the authors cited intrinsic motivation based on situational involvement as a key determinant of the construct (Wöran & Arnberger, 2012; Decloe et al., 2009; Delle Fave & Massimini, 2003; Jones et al., 2000; McIntyre and Roggenbuck, 1998; Jackson & Marsh, 1996).

A key component of the ESM approach is the measurement and collection of real-time data during the course of an activity. Hektner, Schmidt, and Csikszentmihalyi (2007) identified three signaling schedule strategies to assist in the ESM. The first signaling schedule includes interval-contingent sampling in which respondents self-report at the same time each day (Scollon, Kim-Prieto, & Diener, 2003; Hektner et al., 2007). In Event-contingent signaling, participants are required to self-report based on their schedule in a specific activity (Scollon et al., 2003; Hektner et al., 2007). Respondents record their perceptions of the activity after the event has concluded. In this format, respondents are signaled as a way to remind them that surveys should be completed at an appropriate time when individuals are not actively participating in an event. Finally, signal-contingent sampling is the most typical ESM approach

(Scollon et al., 2003; Hektner et al., 2007), in which respondents are signaled at random times throughout the activity (Scollon et al., 2003; Hektner et al., 2007). Once texted or beeped, signal-contingent sampling participants complete the survey as quickly as possible after being signaled.

As part of the data collection process in research by McIntyre and Roggenbuck (1998), a group of black-water rafting participants were required to stop at specific points along the rafting adventure and fill out the experience sampling form (ESF) using signal-contingent sampling. Black-water rafting adventures are defined as white-water rafting inside caves (McIntyre & Roggenbuck, 1998). The ESF survey asks specific questions about the perceived experience of an activity. Questions were based on measurements of mood (Csikszentmihalyi & Larson, 1987) and focus of attention (Borrie & Roggenbuck, 1995). At various points along the rafting adventure, participants were also asked to reflect on their thoughts through journaling as though they were explaining their adventures to another individual. McIntyre and Roggenbuck (1998) concluded that in-situ measurements of person-nature transactions were important to contextualize mood and focus in an effort to better understand personal attributes of outdoor recreation participants. This and another study by Jones et al. (2000) cited that most outdoor research occurs post hoc, therefore use of ESM in measuring "flow" poses the potential for research studies that better inform outdoor recreation agencies about participant interest (McIntyre and Roggenbuck, 1998). Additionally, several studies have cited that global measures of "flow" may not be appropriate for research as it typically implies generalizations across larger populations, whereas "flow" is an measure of individual participants in relation to activities (Hogarth, Portell, & Cuxart, 2007; McIntyre & Roggenbuck; 1998, Jackson & Marsh, 1996). Finally, the authors are quick to point out that a major limitation includes the utilization of

college students as research participants and that a larger sample and broader range of participants would have added to the reliability of the data (McIntyre and Roggenbuck, 1998).

Similar to McIntyre and Roggenbuck (1998), Jones et al. (2000) studied individual kayakers to investigate various aspects of flow theory. The authors' methodology included the utilization of a modified version of the four-channel model developed by Massimini and Carli (1988) as well as the experience sampling method (ESM), which required individuals to fill out a brief questionnaire when they were randomly beeped using electronic beeping devices (signal-contingent sampling) within a specified period of time along the river that was being kayaked. In this research, the kayakers' state of "flow" was determined as the activity progressed over time. Jones et al. (2000) suggested that "flow" and "anxiety" states occurred with more frequency than "boredom" and "apathy." The authors attributed this to whitewater kayaking experiences that were perceived by participants as being more challenging at certain stages of the river (Jones et al., 2000). Jones et al. (2000) also cited that limitations of this research include the low number of subjects (n=52) and inherently limited statistical analyses.

Ellis et al. (1994) utilized the original flow model (Csikszentmihalyi, 1975) and the fourchannel model (Csikszentmihalyi and Csikszentmihalyi, 1988; and Massimini and Carli, 1988) to develop and test an eight-channel flow model. The eight channels included: (1) arousal; (2) flow; (3) control; (4) relaxation; (5) boredom; (6) apathy; (7) worry; and (8) anxiety. According to the authors, previous eight-channel model research had been successful at quantifying the challenge-skill ratio (Ellis et al., 1994). The authors utilized a one-way ANOVA to measure relationships between challenge-skill ratios and measures related to enjoyment and positivity of affect (Ellis et al., 1994). Ellis et al. (1994) defined positivity of affect as the instrument questions related to mood in a typical ESM study (e.g., unhappy to happy, not sociable to

sociable). The findings of the study suggested that individual differences are important to explain the variance in indicators of "flow" (Ellis et al., 1994).

Similar to Ellis et al. (1994), Bassi and Delle Fave (2010) utilized the framework of the eight-channel model to measure "flow" based on goals of high-altitude climbers. The authors point out that an advantage to this type of research is the real-time repeated experience sampling that allowed for the capture of dynamic aspects of the climbers' daily practices while on the mountain (Bassi and Delle Fave, 2010). Further, the authors were able to ascertain that goals and experiences were directly associated to weather conditions during the mountain climbing experience (Bassi and Delle Fave, 2010). The authors concluded that set goals were strongly correlated to the "flow" channel. Furthermore, Bassi and Delle Fave (2010) posited that having goals allowed the participants to have increased optimal experiences ("flow") through focusing attention and organization of behavior and intentions during the mountain climbing expedition. Finally, consistent with other "flow" research, the authors suggested that small sample size was a major limitation to the statistical analyses used in this study (Bassi and Delle Fave, 2010).

An alternative method to validate "flow" was utilized by Jackson and Marsh (1996). The authors' utilized a nine dimension Flow State Scale (FSS) to measure "flow" based on the model proposed by Csikszentmihalyi (1990). Athletes carried electronic beepers and asked to respond to FSS survey questions at varying points in the team or individual sports in which they were participating (Jackson and Marsh, 1996). The nine flow dimensions include: 1) challenge-skill balance; 2) action-awareness merging; 3) clear goals; 4) unambiguous feedback; 5) concentration on task at hand; 6) sense of control; 7) loss of self-consciousness; 8) transformation of time; and 9) autotelic or optimal experience (Csikszentmihalyi, 1990, Jackson & Marsh, 1996). This variant of the FSS was developed to (1) validate prior research both in and out of sport settings;

(2) collect qualitative results from athletes; and (3) measure quantitative characteristics of the experience. An important limitation to this study highlighted by the authors was the ability to capture and quantify experiential states of participants. The authors suggested that qualitative data regarding the "flow" construct may provide richness and complex phenomenological descriptions of the experience that are critical to understanding intrinsic motivation of athletes and otherwise cannot be determined through quantitative data collection techniques (Jackson and Marsh, 1996).

Decloe et al. (2009) conducted research that specifically examined "flow" in both individual and collaborative situations. Participants utilized a logbook to record activities greater than 10 minutes in length over a seven-day period of time. Activities were coded based on recreation, household, job, or transportation endeavors (Decloe et al., 2009). Data for the study were only utilized if an activity was defined as "recreation" related. The data were then analyzed based on the participatory context of the activity. Recreation related experiences were coded as individual, spouse/partner, children, friends, co-workers, other relative, pet, group or club, or other (Decloe et al., 2009). Consistent with other research, the study by Decloe et al. (2009) suggested that situational involvement scores were highest during "flow" activities as opposed to episodes characterized by "anxiety," "boredom," and "apathy." Additionally, Decloe et al. (2009) and Jones et al. (2000) cited that situational involvement "anxiety" scores were consistently higher than "boredom," and "apathy" scores for sample respondents.

Research by Wöran and Arnberger (2012) utilized relationships between recreation specialization and restorative environments to measure mountain hikers' "flow" experiences. According to the authors, the concepts of recreational specialization and restorative environments were closely related to flow experiences (Wöran & Arnberger, 2012). The authors

attributed these occurrences to restorative qualities of being away, fascination and compatibility, as well as the hiker's level of specialization (Wöran & Arnberger; 2012). Wöran and Arnberger (2012) concluded that understanding of the positive influence of recreation specialization on "flow" experience would assist hiking managers to address opportunities for recruitment and marketing efforts.

"Flow" is a complex construct to measure. Much of the mystique and attraction of "flow" lies in the utilization of various approaches to collect and disseminate data. Jackson and Marsh (1996) pointed out that "flow" cannot be fully quantified through the ratio of environmental opportunities for action (challenge) to personal capabilities (skill), but must be approached in ways that consider both quantitative and qualitative aspects as well as the experience that is occurring. Csikszentmihalyi (1992) cautioned that to just use empirical data will compromise the richness and completeness of any study that measures "flow" in experiential situations. Much of the literature to date has measured "flow" using interval level ESM instrument questioning, yet report results as a dichotomous feature (e.g., flow or no flow). Thus, an opportunity exists to measure and report "flow," and to identifying varying levels of "flow" and the instances under which they occur.

#### Satisfaction with the Hunting Experience

Hunter satisfaction literature was developed out of the need to better understand hunter motivations and perceptions during the decision making process by wildlife and natural resources professionals (Cornicelli, Fulton, Grund, & Fieberg, 2011; Hammitt, McDonald, & Patterson, 1990; Langenau & Mellon, 1980; Manfredo, 2004). Hunter satisfaction research by Langenau and Mellon (1980) cited that, "A dynamic approach requires concentration on the younger age classes of hunters because these individuals will comprise the hunting population
for the future." (p. 69) Langenau and Mellon (1980) stated that understanding behaviors of 12- to 18-year-old hunters through surveying of satisfaction of the hunting experience provided professionals with critical information about the hunt. Langenau and Mellon's (1980) research suggested that 43% of youth hunters sampled rated their satisfaction with the hunting experience as either "very good" or "good." Additionally, 33% rated the satisfaction of the hunt as "neither good nor bad." Young hunters reported that seeing game, getting outdoors, and the challenge and suspense of seeking game were all major factors in hunter satisfaction (Langenau & Mellon, 1980). In other research using multiple-satisfactions techniques, researchers cited psychological aspects such as experiencing nature and the outdoors, and social factors such as companionship, crowding and hunter behaviors as being important (Decker et al., 1980; Hammitt et al., 1990). Multiple satisfaction approaches recognize the benefits related to not only the hunting and harvest of animals, but also the psycho-social aspects related to the experience. Although hunting and harvesting wild game is important, other aspects are potential indicators of a satisfying hunting experience. Further, stages of the recreational experience: anticipation, planning, participation and recollection (see Chapter 1; Table 1.2) may be more important to retention of future hunter than aspects such as shots taken and number of deer harvested (Hammitt et al., 1990; Langenau & Mellon, 1980).

Hunter recruitment literature has suggested that although the number of young hunters taking up hunting is keeping pace with the number of individuals leaving hunting through various forms of attrition, the average age of hunters continues to increase (FHWAR, 2007a). Additionally, although the number of hunters across the U.S. is currently stable, trends suggest that this number may decrease over the long-term (Enck et al., 2000). Gaps in the current literature indicate that there is a lack of research that applies behavioral intention to the context

of youth for the purposes of hunter recruitment. These same gaps also suggest that there is a great opportunity to inform state agencies, hunters, and non-hunting populations about how youth experiences during a hunting activity reflect a young person's perceived feeling, interest, mood, and intention to continue hunting. Additionally, young hunter satisfaction research has the potential to be integrated with the theory of "flow" as it relates to youth white-tailed deer hunters.

#### **CHAPTER 4**

# **METHODS**

# Measuring "Flow" and the Implications for Hunter Recruitment in Michigan Special Youth Firearm Deer Hunters

The purpose of this exploratory study was to determine if participation in recreational hunting activities (i.e. the Michigan Special Youth White-tailed Deer Hunt) resulted in "flow" experiences and if those experiences were related to behavioral intentions to continue hunting in the future. Flow was measured using an interval-scale survey instrument that I developed to measure involvement with the recreational activity of white-tailed deer hunting.

The study was accomplished by measuring: (1) youth demographic information; (2) interest level of participants prior to the special firearm white-tailed deer season using the youth hunting interest survey (Appendix D); (3) "flow" using the Experience Sampling Method (ESM) instrument (Appendix F); (4) youth experience with nature using a wildlife inventory (Appendix G); and (5) intention to continue hunting and satisfaction of the hunt in an survey to be filled out after the "flow" surveys have been completed (Appendix I) (Table 4.1). Additionally, youth participants were encouraged to journal about their experiences throughout the research study.

This chapter presents the study methods in the following sections: (1) subject selection; (2) methods and instrumentation; and (3) analytical methods.

### **Subject Selection**

The subjects for this were recruited through several processes. Discussions with MHE instructors and the researcher occurred at a Natural Resources Commission Meeting on December 8, 2011, at a Michigan Hunter Education instructor update on April 22, 2012, and at a statewide Michigan Hunter Education Meeting held from July 13 to 15, 2012. Instructors from

Survey	When Respondents Take	Table of Contents
Background Survey	The Background Survey administered at the participant's respective Hunter Education course.	Appendix D
ESM Hunting Survey or Experience Sampling Form (ESF)	Youth respondents survey at 12:00 p.m. and 9:00 p.m. on September 22 and 23, 2012.	Appendix F
Wildlife Inventory	Youth respondents inventory of wildlife while participating in the special youth firearm deer hunt on September 22 and 23, 2012.	Appendix G
Hunting Experience and Satisfaction Survey	The Experience and Satisfaction survey filled out immediately following the last ESM Hunting Survey.	Appendix I

Table 4.1. Survey instruments used in exploratory study.

around Michigan agreed to provide a forum for the researcher to give a presentation and to petition voluntary youth subjects (with consent permission from parents/guardians) to participate in this study. Recruitment of subjects for this study occurred at nine Michigan Hunter Education classes in late July, August and September 2012. Subjects for this study were selected according the following criteria, including: (1) being a 2012 graduate of a traditional Hunter Education program; (2) parental consent and youth assent to participate in the study; (3) youth who were between 12 and 16 years of age; and (4) youth willingness and ability to fill out the ESM surveys during the 2012 Michigan Special Youth Deer Hunt. The age criterion for this study was based

on youth hunters that could participate in the Michigan Special Youth Firearm White-tailed Deer Hunt using a firearm (September 22 and 23, 2012).

Prospective participants and parent(s) or guardian(s) were invited to participate during their respective Hunter Education courses. Willing youth and parents read and signed the consent/assent form prior to starting the Hunter Education class. Additionally, assenting youth completed the background survey as the first phase of data collection. A goal of 50 subjects was determined to be appropriate for this study based on previous "flow" studies (Hektner et al., 2007). However, additional respondents were encouraged to participate in an effort to add validity and reliability to the study. The size of this purposeful sample was based on an analysis of literature that suggested ranges of six (Hektner et al., 2007) to 800 participants (Csikszentmihalyi & Hunter, 2003). A recreational-based research study of youth by Csikszentmihalyi, Larson, and Prescott (1977) utilized a sample of thirty-five participants to report daily activity and quality of their experiences during a normal week. In this same study, the sampled youth participants ranged from 13 to 18 years of age.

Due to a desired sample size goal of 50 participants, this exploratory study was implemented to develop: (1) a basic understanding of topic-related concerns to a given population where there is a lack of research; (2) opportunities to explore larger studies; or (3) methodology that is broader in scope (Vaske, 2008). The purposeful sample for this study was derived from the 9,644 youth hunter's ages 12 to 16 years-of-age that participated in Michigan Hunter Education during the fiscal year 2012 (October, 1 2011 through September, 30 2012) (S. McConeghy, personal communication, January 3, 2013). During the same fiscal year 2012, a total of 21,759 individuals participated in the certification program (S. McConeghy, personal communication, January 3, 2013). Of this population, 19,859 (91.4%) were certified using

traditional classroom and field experience, 201 (0.9%) were certified using the web-based course option and field experience, and 1,669 (7.7%) chose the home study option for certification. However, previous research suggested that: (1) a large percentage of hunters typically hunt deer as their choice of wildlife (78%), and (2) over 90% of youth who take hunter safety are certified by traditional classroom and field study instructional methods (See Chapter 1). Therefore, although the sample size is small in comparison to other survey research, the sample reflects the methodology used in this type of study, the way in which youth are currently certified, and the choice of wildlife that is typically hunted.

Research by Hektner et al. (2007) suggested that participant attrition rates are typically low (< 10%) in ESM studies across various populations. Additionally, Csikszentmihalyi and Larson (1987) cited that participation rates in ESM studies where youth are the subjects are as high as 91%. Research also suggested that if participation attrition does occur it may be due to lost data booklets in the mail or participants being unable to participate in the activity due to various constraints, which may be characteristics more attributable to youth (Hektner et al., 2008).

The background, ESM, and hunting experience and satisfaction instruments were piloted using: (1) current professionals involved with youth and hunting; and (2) youth that have had Michigan Hunter Education and have participated in a previous hunting experience (12 to 16 years of age). Piloting this study's instruments ensured readability, validity, and reliability of questions asked and that surveys were appropriate for the September youth white-tailed deer hunt. Pilot testing the study's instruments provided youth an opportunity answer questions based on hunting experiences that occurred prior to May and June, 2012.

Two professionals affiliated with Hunter Education and shooting sports were asked to read through the instruments and provide comments and feedback regarding the content and format of the instruments for this study. Peggy Ruby, Southern Michigan Hunter Education Field Coordinator for the Michigan Department of Natural Resources and Dale Elshoff, Conservation Education Specialist and 4-H Shooting Sports Coordinator at Michigan State University provided comments and feedback on the survey instruments.

In early July 2012, ten youth were asked to complete the three instruments while reflecting on a prior deer hunting experience. This original 9 to 1 male to female ratio was originally selected based on current percentages of male to female hunters in Michigan. Of the nine males and one female youth in this group, six of the males and the one female completed and returned the surveys (86% male, 14% female). The average age of the pilot participants was 14.7 years (SD = 1.38). Of the ten youth who were asked to participate in the pilot study, seven completed and returned the surveys. Reliability analyses showed that the "flow" items were internally consistent (Cronbach's Alpha ( $\alpha$ ) = .818). This analysis of reliability is consistent with the ESM literature (Hektner et al., 2007). One concern during this phase of the study was the three initial questions asked to participants as identifying features between all instruments. Although there were no repeated identifiers when participants were asked to write down the first three letters of their favorite (1) athletic team, (2) subject in school, and (3) food; it was determined that enough of the study participants could have chosen repeated identifiers in several of the questions as there are only a finite number of options to choose from. Therefore, the instrument matching questions were changed to the first three letters of the respondents' favorite (1) athlete (last name), (2) animal, and (3) food. Additionally, the pilot testing also

provided a variety of written responses that reinforced the usefulness of open-ended questions in this study.

The sample was selected from graduates of Michigan Hunter Education classes attended from August 11, 2012 to September 16, 2012. I went to nine Michigan Hunter Education classes across central and southern Michigan and solicited instructors to present my proposal and instruments to youth ages 12 to 16 and their parents or guardians. Hunter Education classes attended to recruit subjects included: the Michigan Outdoor Recreational Safety (Genesee County); the Livingston County Sportsman's Club (Livingston County); Compounds and Crossbows (Eaton County); the Saginaw Field and Stream Club (Saginaw County); the Red Fox Sportsman's Club (Hillsdale County); the Grass Lake Sportsman's Club (Jackson County); the Ackerson Lake School/Onondaga Sportsman's Club (Jackson County); Ovid-Elsie High School (Clinton County); and the Shiawassee Conservation Association (Shiawassee County). Hunter Education classes ranged in size from 30 participants (Eaton and Livingston Counties) to 128 participants (Hillsdale County) for a total of 574 participants with an average class size of 64 participants among all classes.

In this research, it is important to understand that there are additional concerns related to data collection with youth. Bruzzese and Fisher (2003), suggested that there is ethical value of informed assent as youth need to be able to: (1) comprehend the nature of the study; (2) understand their research rights, including the right to volunteer or withdraw from the study, to receive and understand information about the study, and have their data remain confidential; and (3) understand how they can protect themselves from violation of rights. In this study, I sought parental consent for youth participation and youth assent to participate in the research at the participant's respective Michigan Hunter Education course (Appendix I).

#### **Methods and Instrumentation**

### The Experience Sampling Method (ESM)

This study uses a modified experience sampling method (ESM) to capture individuals' representations of experience as they occur within the context of everyday life activities (Hektner et al., 2007). Research suggests that ESM protocol is ideally suited to measure human dimensions of experience that are context-dependent (i.e. during hunting experiences) and that the protocol addresses the psychological perceptions of individuals in this context: "How do you feel right now?" (Hektner et al., 2007).

I utilized an ESM paper-and-pencil survey instrument with respondents. The paper-andpencil form of the survey was chosen over other forms of ESM surveying (i.e. cellular phones or computer technology) due to reliability challenges. These challenges included inappropriate signaling and safety considerations during the hunting/recreational experience (Bassi & Delle Fave, 2010; Decloe et al., 2009; Jones et al., 2000; McIntyre & Roggenbuck, 1998). Additionally, Hektner et al. (2007) have cited that paper-and-pencil ESM surveys are inexpensive and convenient for participants. However, the authors also suggested that a drawback to paper-and-pencil surveys is that respondents must be responsible for keeping track of an ESM booklet, a signaling device (e.g., pager, cellular phone, or other similar device) and a writing utensil (Hektner et al., 2007). Due to my study being based on the principle of eventcontingent sampling (taking the survey during or with regard to a specific event), respondents were only responsible for the booklet and a writing utensil at that specific time that they took the ESM survey (noon and 9 p.m. on the field experience days). When not filling out ESM surveys, respondents filled out the youth wildlife inventory portion of the booklet to engage in and document the experience without creating unsafe conditions or situations that may inhibit the

success of the hunt. An additional potential drawback to the paper-and-pencil survey method was conversion of the information into a useable electronic format (Hektner et al., 2007). According to the authors, paper-and-pencil questionnaires should be coded and entered into electronic format by hand, which introduces the potential for considerable cost, time delay, and risk of human error (Hektner et al., 2007).

For my study purposes, acquisition of data in this study began at the respondents' respective Michigan Hunter Education course (Background Survey) and concluded with the twoday Michigan Special Youth Firearm White-tailed Deer Hunt on September 22 and 23, 2012 where the ESM survey and Hunting Experience and Satisfaction Survey was taken.

The ESM hunting survey, wildlife inventory checklist, and hunting experience and satisfaction surveys were provided in booklet form to respondents. Additionally, parents and youth were provided with instructions that assisted youth respondents in the properly filling out of the ESM hunting survey (Appendix F), wildlife inventory (Appendix G) and hunting experience and satisfaction survey (Appendix I) during and after the Michigan Special Youth Firearm White-tailed Deer Hunt. Based on research by Hektner et al. (2007), experience-samples should be limited to 1-2 minutes once respondents become proficient at taking the survey. However, due to the scope of additional questioning and signaling schedule (twice per day) the ESM survey for my study took less than ten minutes to complete. See Appendix G for a sample ESM data collection form (ESF) that was used in this research.

A background survey (Appendix D) that is not part of the booklet was used to determine basic demographic, prior and current hunting experience, and interest characteristics. The background survey includes dichotomous, categorical and continuous questions that provided

nominal, ordinal and interval level data and framed the research by providing background information from the respondents who participated in the study.

According to Hektner et al. (2007) there are three options for signaling respondents in ESM research (Table 4.2). I utilized an event-contingent sampling protocol in which participants were asked to fill out the ESM survey at noon and again at 9:00 p.m. This survey sampling style (Event-Contingent) was utilized based on beginning (6:49 to 6:50 a.m.) and ending (8:00 to 7:58 p.m.) hunting times (MDNR, 2011d), in addition to making the survey as unintrusive to the hunting experience as possible. The noon survey was filled out at lunchtime when deer

Sampling Style	Definition (Hektner et al., 2007)	Advantages
Interval- Contingent	Sampling procedure where respondents fill out the ESM survey based on pre-determined time intervals.	Most applicable to situations where research simplicity is needed.
Event- Contingent	Sampling responses to ESM surveys are based on a particular event of interest.	Specific to a particular event. May be appropriate for precise non-generalizable situations.
Signal- Contingent	Sampling is based on participants being signaled at random times over several days or weeks.	Random sampling structure. Advantageous in situations where individuals are being sampled over long periods of time.

Table 4.2. ESM survey signaling protocol definitions and advantages.

movement and hunting is typically at a minimum. The 9:00 p.m. survey time was selected since hunting hours have ended, and the respondents are likely to be in a setting that is safe and conducive to filling out the survey. The two times ensured that youth have time to fill out the ESM hunting survey when it is safe to do so or not disruptive to the hunting experience. Hektner et al. (2007) cited that one key to the success of an ESM study is striking a balance between obtaining a representative sample of time intervals from respondents and overburdening or interrupting participants during potential "flow" experiences.

The experience sampling method can go beyond typical social-psychological research by assisting in quantifying youth "flow" experiences while white-tailed deer hunting. The remaining components of this section examine the principles that undergird ESM including the experience sampling form (ESF), rating-scale, and validity and reliability.

#### **The Experience Sampling Form (ESF)**

The experience sampling form (ESF), which is the survey instrument of ESM (Table 3.1), was designed to include questions that investigate respondents' internal and external dimensions of experience as defined by Csikszentmihalyi and Larson (1984) (Appendix F). External dimensions reference the time, date, physical location, activities, and companions. According to Hektner et al. (2007), referencing the date and time in an ESM structured research project are important aspects of the external experience. The development of an ESF will provide a means to examine whether youth have "flow" experiences during recreational hunting (Hektner et al., 2007).

"Flow" was measured utilizing two types of questions on the ESF. The perceived challenge and skills of the hunting activity will be used to determine "flow." Additionally, "flow" was measured based on whether perceived challenge and skill are above the individual's

average or not (Csikszentmihalyi et al., 1993; Massimini & Carli, 1988). The ESM instrument for this study includes dichotomous, categorical, continuous and open-ended questions that will provide nominal, ordinal and interval level data to frame the ESM portion of the research. The "how you felt" section of the ESM instrument asked participants about the perceived challenge and skill level during the hunt. These questions are of a 5-point Likert type scale format ranging from "Not at all" (1) to "Very much" (5). According to Hektner et al. (2007) the challenge and skill questions in the "how you felt" section of the ESM survey are indicators used to determine the conditions in which a "flow" experience will most likely occur. The "interest level" questions will ask individuals to rate their interest while on the hunt. These continuous questions are in a 5-point Likert type scale format ranging from "Not at all" (1) to "Very much" (5). The "mood" series of questions is in a Likert 5-Point scale (e.g., Not Happy = 1 to Very Happy = 5).

Jackson and Marsh (1996) and Hektner et al. (2007) suggested using a multi-method approach to determining "flow" and the optimal experience, therefore qualitative data collection may provide additional opportunities to triangulate quantitative ESM data. Further, McIntyre and Roggenbuck (1998) suggested the use of reflective journaling to validate the results of the interval-contingent survey. The surveys within the youth firearm deer hunting "flow" booklet for this study contain specific open-ended questions that serve as an opportunity for respondents to elaborate on their feelings and experiences about their hunting experiences. The open-ended questions provide youth the opportunity reflect on their hunting experiences. These questions were used to provide the researcher with additional information to assist in analysis of the data and provide potential opportunities for future recruitment and retention related surveys.

Rating scale items of ESF are designed to measure concentration or attention, assessment about the activity, feeling about oneself or others, and the general mood of the participant

(Hektner et al., 2007). Rating scales using ESF are combined with analyses to form composite measures of interest level, mood and perceived challenge during an event or activity (Appendix F). Hektner et al. (2007) suggested that it is important to identify desired measureable components prior to the study in order to provide adequate time to include necessary questions on the ESF.

The hunting experience and satisfaction survey items assess the intention of participants to continue hunting after the youth white-tailed deer hunt and satisfaction with their overall hunting experience (Appendix I). Respondents were asked satisfaction questions about the hunting experience using a 5-point Likert scale rating system with are range of "very good," "good," "OK," "poor," and "very poor" (Langenau & Mellon, 1980). Participants were also asked dichotomous and categorical questions about their intentions to hunt and types of hunting that may occur in the future. Finally, youth were asked an open-ended question to explain their ONE most important reason why or why they will not continue hunting in the future.

#### Validity

Validity is an important consideration when developing and administering an ESM-based research study. Groves (1987) defined internal validity as the correlation between a measure and the true value of the attribute, examined on a set of individuals. Due to ESM's focus on everyday life, the method emphasizes external or ecological validity over internal validity (Hektner et al., 2007). Hektner et al. (2007) defined ecological validity as the ability to ask for surveys to be filled out as close to or even during (e.g., ESM) the activity being measured. In the case of ESM, respondent measurements are taken at such a high frequency and under real-life conditions, which provide for high internal validity during an ESM study, hence high ecological validity. Hektner et al. (2007) cited that internal validity in ESM is strong due to the frequency at which

the ESF data are collected, which is much greater than a one-time questionnaire. However, immediacy of answering questions (recall error), tendency to choose responses that are not based on the actual experience (reflexivity bias), and social desirability of answering a questionnaire during everyday life occurrences have all been cited as challenges related to internal validity of ESM surveys (Hektner et. al., 2007).

Recall error is an important component with regard to ESM-based activities (Hicks et al., 2010). Recall error is caused by participants not being able to recall, or recalling in an inaccurate way events a day, week, month or later. These errors are caused by variability in emotional state of respondents, by the length of time after the signal that participants are asked to recall information, and by the environment within which participants are participating in the ESM study. Recall error may be a major problem when youth are responding to ESM surveys during hunting experiences. Additionally, to minimize the potential for individual response bias errors, the literature suggests the use z-scores of challenge and skills constructs in ESM studies (Csikszentmihalyi, 1988; Massimini & Carli, 1988).

Reflexivity bias is also an integral component of internal validity (Hektner et al., 2007). Reflexivity bias refers to a respondent's ability to be able to discern the purpose of the research, hence modifying answers to reflect a bias to the study being conducted. By signaling respondents many times during a sampling day or activity to fill out the ESM, reflexivity bias will be minimized within a research project. Reflexivity bias is not an implication of this study as youth participant hunting success and safety are not direct factors related to hunting success.

Situational validity is a form of external validity within ESM. Situational validity is defined as the ability to examine the construct related to internal logic in an effort to report on the convergence of time, context and activity when contextualizing ESM (Hektner et al., 2007).

Research suggests that situational validity is typical for ESM activities (Csikszentmihalyi & Larson, 1984; Hektner et al., 2007). Situational validity may be a concern if, in the case of hunting, one would typically be in a relaxed state while participating in the activity where the behavior is considered "normal." If the participant is consistently exhibiting behavior that is not considered being in a state of boredom, this may imply that situational validity is be compromised in the research.

Ecological validity is the opposite of external validity. The two constructs can be thought of as the inverse of one another. External validity ensures that results are generalizable in specific instances, whereas ecological validity ensures that generalized results hold up in specific instances (Hektner et al., 2007).

Use of paper-and-pencil devices for the purposes of my study of "flow" in Michigan youth deer hunters will inherently minimize the potential for internal validity issues. By providing paper-and-pencil survey instruments to respondents, I can provide a means for quick response at the time when the survey should be completed. An additional goal of the ESM framework for this study is to minimize intrusiveness in the lives of respondents. Minimizing this intrusiveness will inherently provide as normal a situation as possible while collecting ESM data.

#### **Reliability**

One of the major implications to consider in relation to reliability is with respect to accuracy of reporting (Hektner et al., 2007). Reactivity relates to the ability for participants to respond to and fill out the ESM survey as soon after the interval-, event- or signal-contingent request occurs. Study participants who respond to an ESM signal in a timely manner are more likely to provide accurate data for the research. The slower the response time in relation to when

the participant was signaled, the less accurate the data might become. Additionally, participants may alter their daily or weekly activities in an effort to anticipate signaling during an ESM event. For this study, I expect respondents to fill out the ESM survey as quickly as near as possible to the denoted time during the hunt, while adhering to the various safety aspects related to using a firearm in a hunting situation.

In ESM, reliability takes on two distinct pathways. ESM research can be either a collection of participants or activities that are experienced (Hektner et al., 2007). Many of the same concerns that traditional research shares regarding reliability are also a concern with ESM research. One particular concern highlighted by Zuzanek (1999) is the attempt to move away from purposive sampling to a representative sampling structure indicative of more traditional research. Although this is an important consideration for our study, the goal is to measure youth during the Michigan Special Youth Firearm White-tailed Deer Hunt in September of 2012. Therefore a finite purposeful sample that is specific to Michigan youth deer hunters was used for data collection.

It is also important to underscore that response rates in ESM are deceiving. Response rates in a traditional survey are based on the response to a one-time questionnaire, whereas response rates in an ESM research study are based on the proportion of recruits in a study that agree to participate with respect to the signal response rate and proportion of signals in which responses are completed (Hektner et al., 2007). According to Hektner et al. (2007), self-selection bias is important and must be examined prior to data acquisition. Hektner et al. (2007) also suggested that researchers conducting ESM studies might find value in requiring respondents to supplement the ESF with a daily or weekly reflective journal.

Measurement of internal consistency is achieved through calculation of Cronbach's alpha. However in the case of ESM construct reliability, Cronbach's alpha is calculated based on average responses of several highly intercorrelated constructs (Hektner et al., 2007). Eid and Diener (1999) found that measurement of internal emotional states have reliability coefficients ranging from .69 to .91. In the case of ESM, reliability risks are minimized due to multiple signaling answers coming from a single item on the research instrument.

### **Analytical Methods**

Analytical procedures of ESM research range from basic descriptive statistics to complex multivariate procedures (Hektner et al., 2007). However, research by Kimiciek and Stein (1992) suggested that basic statistical procedures (descriptive analysis and univariate tests-ANOVA) are preferred to multivariate procedures in ESM studies.

For the purposes of assessing four-channel "flow" model data, youth "flow" survey responses will be converted to z-scores to control for individual response bias. Challenge-skill survey questions will be used to determine channels (flow, anxiety, boredom, and apathy) within the four-channel model (Csikszentmihalyi, 1988). Determining flow and non-flow in the original model required a literal match of challenge-skill data. Conversely, the four-channel model of "flow" was used to measure the balance of z-scores for challenge-skills (see Figure 3.2).

The four-channels ("anxiety," "apathy," "boredom," and "flow") are categorized into interval variables that measure the level of challenge and skill (see Figure 3.2), as well as associated indicators of interest and mood (Appendix F). Perceived challenge and skill are represented by the instrument questions, "How challenging was it?" and "How skilled are you at it?" and measured with 5-point Likert-type response options.

For the purposes of measuring the four-channel model, the intersection of the four constructs ("anxiety," "apathy," "boredom," and "flow") is the calculation of an individual's perceived average challenge and skill during the course of the activity (Csikszentmihalyi et al., 1993; Massimini and Carli, 1988). Using individual challenge and skill ratings for each of the hunting events (Saturday AM through Sunday PM): (1) "boredom" is observed when an individuals perceived skill exceeds challenge; (2) "anxiety" is observed when perceived challenge exceeds skill; (3) "apathy" is observed when both measures are below the individuals average; and (4) "flow" is observed when both challenge and skill are above the individuals average over the entire hunt. In this study "flow" is measured by the quotient of challenge to skill levels perceived by respondents in the ESM Survey Questions 21 and 23 (Appendix F). Average challenge and skill levels among respondents are calculated as the intersection of the four constructs in determining whether "flow" is occurring or not and at what level (boredom, anxiety, apathy, and flow).

The first hypothesis was informed by flow theory (Csikszentmihalyi, 1975) through the measurement of various levels of the "flow" construct during the hunt using the four-channel "flow" model (Massimini & Carli, 1988). Hypothesis 1 (Ho1 and H1) was addressed by analysis of descriptive statistics from the youth hunting interest survey (Appendix D) and a 1-way ANOVA (F test statistic) on the youth firearm deer hunting "flow" survey data (Appendix F). According to previous research the four-channel model of "flow" is typically addressed by one-way ANOVA analysis (Ellis et al., 1994; Jones et al., 2000; Massimini & Carli, 1988; Stein, Kimiciek, Daniels, & Jackson, 1995). Additionally, a Post-hoc comparison using a modified Fisher's LSD (Bonferroni) correction will be utilized to keep *p*-values ( $\alpha$ ) at desired levels ( $\alpha$ =.05,  $\alpha$ =.01,  $\alpha$ =.001) (Vaske, 2008). Post-hoc comparison provides an opportunity to discover

previously undetected patterns that were not discovered using a priori statistical procedures. Independent measures for hypothesis 1 (H1) include an ordinal variable that is categorized utilizing the four-channel model ("anxiety," "apathy," "boredom," and "flow"), based on ratio of the challenge and skill constructs. Dependent variables for hypothesis 1 (H1) include measures adapted from Csikszentmihalyi's (1975, 1990) elements of flow and flow indicators cited and adapted based on Jackson and Marsh (1996) and Jones et al. (2000). The dependent measures for hypothesis 1 are based on interval questions related to constructs of how the participant felt, their mood and perceived interest level (ESM Survey Questions 21 to 43, Appendix F) during the hunting activity.

The second hypothesis was informed by flow theory (Csikszentmihalyi, 1975) in the context of a youth white-tailed deer hunting experience relative to the four-channels (anxiety, apathy, boredom, and "flow") of the flow model adapted by Massimini and Carli (1988). Hypothesis 2 (Ho2 and H2) was addressed using a Chi-Square Test of Association ( $\chi^2$  test statistic) and crosstabs procedure to compare the percentages of experiences within each channel (anxiety, apathy, boredom, and "flow") to ordinal and interval questions related to hearing, seeing, shooting at, and harvesting white-tailed deer (Appendix F). Independent measures for hypothesis 2 (H2) include an interval variable that is categorized utilizing the four-channel model (anxiety, apathy, boredom, and "flow"). Dependent variables for hypothesis 2 (H2) include at the hearing, seeing, shooting at, and harvesting seeing, shooting at, and harvesting the four-channel model (anxiety, apathy, boredom, and "flow"). Dependent variables for hypothesis 2 (H2) include an interval variable that is categorized utilizing the four-channel model (anxiety, apathy, boredom, and "flow"). Dependent variables for hypothesis 2 (H2) include measures related to hearing, seeing, shooting at, and harvesting deer during the hunting activity (ESM Survey Questions 10 to 18, Appendix F).

The third hypothesis examines if participants that achieve different levels of "flow" during youth firearm deer hunting experiences intend to continue hunting. Hypothesis 3 (Ho3 and H3) will utilize a discriminant analysis (F test statistic) to compare respondents that exhibit

various levels of "flow" and categorical (ordinal) questions (ESM Survey Questions 14 to 22) related to youth intentions to hunt (Appendix I). The independent or grouping variable for hypothesis 3 (H3) included an interval variable that is categorized utilizing the four-channel model (anxiety, apathy, boredom, and "flow"). Dependent measures for hypothesis 3 (H3) include measures related to hunting participation (ESM Survey Questions 4 to 18, Appendix F), rating of the hunting experience (HE Survey Questions 4 to 13, Appendix I), and intention to continue hunting in the future (HE Survey Questions 14 to 22, Appendix I). The goals of utilizing a discriminant analysis in hypothesis 3 were to: (1) categorize respondents into appropriate groups using a discriminant prediction equation; (2) measure the relative importance of the "flow" (independent) variables in classifying dependent variables; and (3) determine the percent of variance in the dependent variables explained by the "flow" variables (Vaske, 2008). The discriminant analysis involves: (1) determining significance using the F test (Wilks' lambda), and (2) if the F test is significant, the "flow" variables are calculated to determine their relative impact to classify the levels of dependent variables (Vaske, 2010). For this study the equation that describes the discriminant function is:

$$D_{i} = d_{i1}Z_{1} + d_{i2}Z_{2} + d_{i3}Z_{3} + d_{i3}Z_{3} + d_{ip}Z_{p}$$

Where:

 $D_i$  = the score on the functions of "flow" d = weighting coefficients, and Z = the standardized values of the p discriminating variables used in the analysis

#### CHAPTER 5

### RESULTS

The purpose of this exploratory study was to determine if participation in recreational hunting activities (i.e. the Michigan Special Youth White-tailed Deer Hunt) resulted in "flow" experiences and if those experiences were related to behavioral intentions to continue hunting in the future.

Three objectives were addressed in this exploratory study. First, could varying levels of "flow" be quantified during the youth white-tailed deer hunting experience? Second, were these "flow" experiences related to hearing, seeing, shooting at, and harvesting a deer? And finally, were these "flow" experiences related to a young hunters level of participation and experience during the hunt, and intention to hunt in the future?

This chapter will review the results of this exploratory study using the following subheadings: (1) Survey Response; (2) Initial Background Survey Descriptive Statistics; (3) Completed Background Survey Descriptive Statistics; (4) ESM Hunting Survey Descriptive Statistics; (5) Hunting Experience and Satisfaction Survey Descriptive Statistics; (6) Relationship Between Channels and Indicators of Flow; (7) Frequency of Channels Among Hunting Experiences; and (8) Intention to Continue Hunting as a Function of Flow.

### **Survey Response**

Of the original, 182 distributed Background Surveys and Packets (ESM Hunting Surveys and Hunting Experience and Satisfaction Survey), 98 Background Surveys were returned (53.8% of packet recipients) (Figure 5.1). Of the 98 initial respondents, 52.0% (51) of the Background Survey participants returned their ESM Hunting Surveys and Hunting Experience and Satisfaction Surveys. Of these 51 respondents, 43 (43.9%) were determined to be complete. A

survey was determined to be complete if the following were completed and returned to the researcher: (1) Initial Background Survey; (2) a minimum of one of four ESM Hunting Surveys; and (3) the Hunting Experience and Satisfaction Survey.

Participation and Response Rates of Youth During the ESM Hunting Experience Study



Figure 5.1. Participation and response rates of youth respondents (ages 12 to 16) during the ESM Hunting Experience Study.

### **Background Survey (Initial Participants)**

Of the 98 respondents who originally agreed to participate in this study, participants ranged from 12 to 16 years of age (Table 5.1). Of the initial respondents that filled out the Background Survey, 72 (73.5%) were male and 26 (26.5%) were female. The average age of the 98 initial respondents was 12.61 (SD – 0.99).

Age of Participants	Total #	%	Males #	%	Females #	%
12	58	59.1	42	58.3	16	61.6
13	27	27.6	22	30.6	5	19.2
14	6	6.1	4	5.6	2	7.7
15	5	5.1	3	4.2	2	7.7
16	2	2.1	1	1.3	1	3.8
Total	98	100.0	72	100.0	26	100.0

Table 5.1. Distribution of youth respondents who participated in the Background Survey (n=98).

Of the initial participants in the Background Survey 55 of 98 (56.1%) respondents indicated that they had hunted with a firearm prior to taking Michigan Hunter Education (MHE). Male respondents accounted for 46 of the 55 (83.6%) participants who had hunting experience prior to taking their MHE course. Of the respondents who indicated that they had hunted prior to taking their MHE course, 50 of 55 (91.0%) indicated that they had hunted with their dad (Table 5.2). Of the 50 who indicated having previous experience hunting with their dad, 41 of 46 (89.1%) were male and 9 of 9 (100.0%) were female (Table 5.2).

Previous Hunting Partners			
	Total # (%) (n=55)	Males # (%) (n=46)	Females # (%) (n=9)
Mom	4 (7.3)	4 (8.7)	0 (0.0)
Dad	50 (91.0)	41 (89.1)	9 (100.0)
Brother	2 (3.6)	2 (4.3)	0 (0.0)
Sister	0 (0.0)	0 (0.0)	0 (0.0)
Grandparent	10 (18.2)	10 (21.7)	0 (0.0)
Aunt	0 (0.0)	0 (0.0)	0 (0.0)
Uncle	4 (7.3)	4 (8.7)	0 (0.0)
Cousin	1 (1.8)	1 (2.2)	0 (0.0)
Friend	2 (3.6)	2 (4.3)	0 (0.0)
Neighbor	0 (0.0)	0 (0.0)	0 (0.0)
Total	55	46	9

Table 5.2. Distribution of respondents (youth white-tailed deer hunters) who hunted with family and friends prior to the study (n=55).

Note. Youth respondents could select multiple categories.

Initial Background Survey results indicated that 27 of 98 (27.6%) respondents participated in Michigan's Apprentice Hunting License program prior to their MHE course. Of the 27 respondents who participated in the apprentice hunting license program, 21 of 27 (77.8%) were males. Finally, 3 of 98 (3.1%) indicated that they were unsure whether they hunted under the Apprentice Hunting License program prior to taking their Hunter Education course. From the original number of 98 respondents, 84 (85.7%) youth indicated that they had gone hunting before they were able to shoot (Table 5.3). Of the youth respondents, 74 (88.0%) indicated that they had hunting experiences with their dad before they could shoot, 23 (27.4%) with a grandparent before they could shoot, and 18 (21.4%) had previous hunting experiences with an uncle when they could not shoot more than any other adult (Table 5.3). Additionally, distributions of previous hunting partners were similar between males, females, and total youth hunters (Table 5.3)

In the initial Background Survey during this study, 47 of 96 (49.0%) youth indicated that their best friend hunted, whereas 37 of 96 (38.5%) of respondents indicated that their best friend did not hunt. Males represented 42 of 47 (89.4%) respondents that indicated that their best friend hunted. Females represented 5 of 47 (10.6%) respondents that indicated that their best friend hunted. Of the youth respondents to the initial survey, 12.5% indicated that they did not know whether their best friend hunted or not.

In the initial sample of 98 respondents, 81 of 98 (82.6%) youth participants indicated that they had watched a TV show, DVD or video about deer hunting in the last year (Table 5.4). Of those who had watched deer hunting TV shows, 59 of 81 (72.8%) were males and 22 (27.2%) were females. Among youth who watched deer hunting shows, 50 of 81 (61.7%) watched for less than 1 hour per week.

In the initial sample of 98 respondents, 78 of 98 (79.6%) youth participants indicated that they had played a video game about deer hunting in the last year (Table 5.5). In the initial sample of 78 youth participants that gamed about deer hunting, 61 (78.2%) were males and 17 (21.8%) were females. Of the respondents in the initial Background Survey sample that played video games, 46 of 78 (59.0%) played these games for less than 1 hour per week.

Previous Hunting Partners			
	Total # (%) (n=84)	Males # (%) (n=63)	Females # (%) (n=21)
Mom	9 (10.7)	7 (11.1)	2 (9.5)
Dad	74 (88.0)	55 (87.3)	19 (90.2)
Brother	3 (3.6)	2 (3.2)	1 (4.8)
Sister	4 (4.8)	3 (4.8)	1 (4.8)
Grandparent	23 (27.4)	19 (30.2)	4 (19.0)
Aunt	0 (0.0)	0 (0.0)	0 (0.0)
Uncle	18 (21.4)	17 (27.0)	1 (4.8)
Cousin	6 (7.1)	5 (7.9)	1 (4.8)
Friend	6 (7.1)	5 (7.9)	1 (4.8)
Neighbor	2 (2.4)	1 (1.6)	1 (4.8)
Total	84	63	21

Table 5.3. Distribution of youth white-tailed deer hunters who hunted with family and friends prior to being able to shoot (n=84).

Note. Youth respondents could select multiple categories.

Time spent watching a TV, DVD, or Video about deer hunting (hours/week)	Total # (%) (n=81)	Males # (%) (n=59)	Females # (%) (n=22)
< 1	50 (61.7)	35 (59.3)	15 (68.2)
1-2	23 (28.4)	16 (27.1)	7 (31.8)
2-3	2 (2.5)	2 (3.4)	0 (0.0)
3-4	2 (2.5)	2 (3.4)	0 (0.0)
> 4	4 (4.9)	4 (6.8)	0 (0.0)
Total	81 (100.0)	59 (100.0)	22 (100.0)

Table 5.4. Initial background survey of youth hunters who watched a TV show, DVD, or video about deer hunting within the last year (n=81)

Youth were asked to rate their participation in outdoor activities using the Background Survey in an effort to provide baseline information about enjoyment of their prior experiences (Tables 5.6 to 5.14). For all activities, 61.2% indicated that they "Really Enjoyed" being in the outdoors (Table 5.6), 39.8% indicated that they "Really Enjoyed" watching wildlife (Table 5.7), 70.8% of youth respondents "Really Enjoyed" hunting (Table 5.8), 58.2% of youth "Really Enjoyed" fishing (Table 5.9), 26.3% of youth respondents "Really Enjoyed" hiking (Table 5.10), 56.1% of youth respondents "Really Enjoyed" camping (Table 5.11), 62.3% indicated that they "really enjoyed" shooting sports (Table 5.12), and 66.3% of youth respondents "Really Enjoyed" sports (Table 5.13). Only 31.7% of youth participants indicated that they "Really Enjoyed" gaming and 10.2% indicated that they "Don't Enjoy" gaming at all (Table 5.14).

Time spent playing video games about deer hunting (hours/week)	Total # (%) (n=78)	Males (%) (n=61)	Females (%) (n=17)
< 1	46 (59.0)	34 (55.7)	12 (70.6)
1-2	13 (16.7)	12 (19.7)	1 (5.9)
2-3	11 (14.1)	10 (16.4)	1 (5.9)
3-4	3 (3.8)	2 (3.3)	1 (5.9)
> 4	5 (6.4)	3 (4.9)	2 (11.7)
Total	78 (100.0)	61 (100.0)	17 (100.0)

Table 5.5. Initial background survey of youth hunters who played video games about deer hunting within the last year (n=78).

Table 5.6. Enjoyment of being in the outdoors to youth respondents to the initial Background Survey data (n=98).

Being in the Outdoors	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	2 (2.1)	1 (1.4)	1 (3.8)
3	12 (12.2)	8 (11.1)	4 (15.4)
4	24 (24.5)	18 (25.0)	6 (23.1)
5 – Really Enjoy	60 (61.2)	45 (62.5)	15 (57.7)
Total	98	72	26
Average (SD)	4.45 (0.79)	4.49 (0.75)	4.35 (0.89)

Watching Wildlife	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (1.0)	1 (1.4)	0 (0.0)
2	9 (9.2)	7 (9.7)	2 (7.7)
3	19 (19.4)	15 (20.8)	4 (15.4)
4	30 (30.6)	17 (23.7)	13 (50.0)
5 – Really Enjoy	39 (39.8)	32 (44.4)	7 (26.9)
Total	98	72	26
Average	3.99	4.00	3.96
(SD)	(1.03)	(1.10)	(0.87)

Table 5.7. Enjoyment of Watching Wildlife to youth respondents in the initial Background Survey data (n=98).

Table 5.8. Enjoyment of Hunting to youth respondents in the initial Background Survey data (n=96). Two youth did not respond to the question.

Hunting	Total # (%)	Males # (%)	Females # (%)
	10441 // (/0)		
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	10 (10.4)	5 (7.0)	5 (20.0)
4	18 (18.8)	12 (16.9)	6 (24.0)
5 – Really Enjoy	68 (70.8)	54 (76.1)	14 (56.0)
Total	96	71	25
Average	4 60	4 70	4 36
(SD)	(0.67)	(0.60)	(0.81)

Fishing			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	2 (2.0)	1 (1.4)	1 (3.8)
2	4 (4.1)	4 (5.6)	0 (0.0)
3	13 (13.3)	8 (11.1)	5 (19.3)
4	22 (22.4)	15 (20.8)	7 (26.9)
5 – Really Enjoy	57 (58.2)	44 (61.1)	13 (50.0)
Total	98	72	26
Average (SD)	4.31 (0.99)	4.35 (0.99)	4.19 (1.02)

Table 5.9. Enjoyment of Fishing to youth respondents in the initial Background Survey data (n=98).

Table 5.10. Enjoyment of Hiking to youth respondents in the initial Background Survey data (n=95). Three youth did not respond to the question.

Hiking	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	11 (11.6)	8 (11.4)	3 (12.0)
2	11 (11.6)	8 (11.4)	3 (12.0)
3	25 (26.3)	20 (28.6)	5 (20.0)
4	23 (24.2)	15 (21.4)	8 (32.0)
5 – Really Enjoy	25 (26.3)	19 (27.2)	6 (24.0)
	- (( )	. ( )	
Total	95	70	25
Average	3.39	3.36	3.44
(5D)	(1.33)	(1.73)	(1.33)

Camping				
	Total # (%)	Males # (%)	Females # (%)	
1 – Don't Enjoy	1 (1.0)	1 (1.4)	0 (0.0)	
2	0 (0.0)	0 (0.0)	0 (0.0)	
3	18 (18.4)	11 (15.2)	7 (26.9)	
4	24 (24.5)	22 (30.6)	2 (7.7)	
5 – Really Enjoy	55 (56.1)	38 (52.8)	17 (65.4)	
Total	98	72	26	
Average (SD)	4.35 (0.85)	4.34 (0.84)	4.38 (0.99)	

Table 5.11. Enjoyment of Camping to youth respondents in the initial Background Survey data (n=98).

Table 5.12. Enjoyment of Shooting Sports to youth respondents in the initial Background Survey data (n=98).

Shooting Sports	Total # (%)	Males # (%)	Females # (%)	
1 – Don't Enjoy	2 (2.0)	1 (1.4)	1 (3.8)	
2	0 (0.0)	0 (0.0)	0 (0.0)	
3	12 (12.2)	10 (13.9)	2 (7.7)	
4	23 (23.5)	14 (19.4)	9 (34.7)	
5 – Really Enjoy	61 (62.3)	47 (65.3)	14 (53.8)	
Total	98	72	26	
Average	4.44	4.49	4.35	
(SD)	(0.86)	(0.83)	(0.94)	

Sports			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (1.0)	0 (0.0)	1 (3.8)
2	4 (4.1)	4 (5.6)	0 (0.0)
3	12 (12.3)	9 (12.4)	3 (11.5)
4	16 (16.3)	10 (13.9)	6 (23.2)
5 – Really Enjoy	65 (66.3)	49 (68.1)	16 (61.5)
Total	98	72	26
Average (SD)	4.43 (0.93)	4.46 (0.91)	4.38 (0.98)

Table 5.13. Enjoyment of Sports to youth respondents in the initial Background Survey data (n=98).

Table 5.14. Enjoyment of Gaming to youth respondents in the initial Background Survey data (n=98).

Gaming			
	1 otal # (%)	Males # (%)	Females $\#$ (%)
1 – Don't Enjoy	10 (10.2)	7 (9.7)	3 (11.5)
2	10 (10.2)	8 (11.1)	2 (7.7)
3	26 (26.5)	18 (25.0)	8 (30.8)
4	21 (21.4)	17 (23.6)	4 (15.4)
5 – Really Enjoy	31 (31.7)	22 (30.6)	9 (34.6)
Total	98	72	26
Average (SD)	3.56 (1.31)	3.56 (1.30)	3.54 (1.36)

# **Background Survey (Participants That Completed All Surveys)**

Of the 43 respondents who completed the Background Survey, at least one ESM Hunting Survey, and the Hunting Experience and Satisfaction Survey, 35 (81.4%) were male and 8 (18.6%) were female (Table 5.15). The average age of the 43 respondents was 12.81 (SD – 1.07).

Of the participants who completed all surveys for the study, 38 of 43 (88.4%) respondents indicated that they had hunted with a firearm prior to taking the Michigan Hunter Education course. Male respondents made up 33 of the 38 (86.8%) participants who had hunting experience prior to taking their MHE course. Of the respondents who indicated that they had hunted prior to taking their MHE course, 30 of 38 (78.9%) indicated that they had hunted with their dad, including 100.0% of female respondents (Table 5.16).

Age of Participants	Total #	%	Males #	%	Females #	%
12	21	48.8	16	45.7	5	62.5
13	15	34.8	12	34.3	3	37.5
14	3	7.0	3	8.6	0	0.0
15	2	4.7	2	5.7	0	0.0
16	2	4.7	2	5.7	0	0.0
Total	43	100.0	35	100.0	8	100.0

Table 5.15. Distribution of youth white-tailed deer hunters who participated and completed the Background Survey, at least one ESM Hunting Survey, and the Hunting Experience and Satisfaction Survey (n=43).

Previous Hunting Partners				
	Total # (%) (n=38)	Males # (%) (n=33)	Females # (%) (n=5)	
Mom	1 (2.6)	1 (3.0)	0 (0.0)	
Dad	30 (78.9)	25 (75.8)	5 (100.0)	
Brother	0 (0.0)	0 (0.0)	0 (0.0)	
Sister	0 (0.0)	0 (0.0)	0 (0.0)	
Grandparent	5 (13.2)	5 (15.2)	0 (0.0)	
Aunt	0 (0.0)	0 (0.0)	0 (0.0)	
Uncle	2 (5.3)	2 (6.1)	0 (0.0)	
Cousin	0 (0.0)	0 (0.0)	0 (0.0)	
Friend	0 (0.0)	0 (0.0)	0 (0.0)	
Neighbor	0 (0.0)	0 (0.0)	0 (0.0)	
Total	38	33	5	

Table 5.16. Distribution of youth white-tailed deer hunters who hunted with family and friends prior to the research study and completed all survey aspects of the study (n=38).

Note. Youth respondents could select multiple categories.

Background Survey results indicated that 14 of 43 (32.6%) of respondents participated in Michigan's Apprentice Hunting License program prior to their MHE course. Of the 14 respondents who participated in the Apprentice Hunting License program, 12 of 14 (85.7%) were male. Finally, 1 of 43 (2.3%) indicated that they were unsure whether they had hunted under the Michigan Apprentice Hunting License program prior to taking their Hunter Education course.

From the final sample of 43 respondents, 38 (88.4%) youth indicated that they had gone hunting before they were able to shoot (Table 5.17). Youth participants also indicated that 34 of
38 (89.5%) had hunting experiences where they could not shoot with dad, 9 of 43 (23.7%) had hunting experiences where they could not shoot with a grandparent and 7 of 43 (18.4%) had previous hunting experiences where they could not shoot with an uncle (Table 5.17) more than any other adult. Male (87.9%) and female (100.0%) youth respondents were more likely to hunt with dad than any other hunting partner within the survey.

Previous Hunting Partners			
i armers	Total # (%) (n=38)	Males # (%) (n=33)	Females # (%) (n=5)
Mom	4 (10.5)	3 (9.1)	1 (20.0)
Dad	34 (89.5)	29 (87.9)	5 (100.0)
Brother	1 (2.6)	0 (0.0)	1 (20.0)
Sister	1 (2.6)	1 (3.0)	0 (0.0)
Grandparent	9 (23.7)	8 (24.2)	1 (20.0)
Aunt	0 (0.0)	0 (0.0)	0 (0.0)
Uncle	7 (18.4)	7 (21.2)	0 (0.0)
Cousin	2 (5.3)	1 (3.0)	1 (20.0)
Friend	0 (0.0)	0 (0.0)	0 (0.0)
Neighbor	0 (0.0)	0 (0.0)	0 (0.0)
Total	38	33	5

Table 5.17. Distribution of youth white-tailed deer hunters who hunted with family and friends prior to being able to shoot and that completed all survey aspects of the study (n=38).

Note. Youth respondents could select multiple categories.

Of the Background Survey where youth participated in all aspects of the study, 23 of 42 (54.8%) youth participants indicated that their best friend hunted. One youth participant did not respond to this question. Males represented 21 of 23 (91.3%) respondents that indicated that their best friend hunted and females represented 2 of 23 (8.7%) respondents. Additionally, 3 of 42 (7.1%) indicated that they were unsure whether their best friend hunted or not. The remaining participants in this study indicated that their best friend did not hunt.

In the purposeful sample of 43 respondents, 34 of 43 (79.1%) youth participants indicated that they had watched a TV show, DVD or video about deer hunting in the last year (Table 5.18). Of the 34 youth participants that watched deer hunting TV shows, 27 of 34 (79.4%) were males and 7 (20.6%) were females. Of the respondents in the sample that watched deer hunting shows, 21 of 34 (61.8%) watched for less than 1 hour per week (Table 5.18).

Time spent watching a TV, DVD, or Video about deer hunting (hours/week)	Total # (%) (n=34)	Males # (%) (n=27)	Females # (%) (n=7)
< 1	21 (61.8)	17 (63.0)	4 (57.1)
1-2	10 (29.4)	7 (25.9)	3 (42.9)
2-3	0 (0.0)	0 (0.0)	0 (0.0)
3-4	1 (2.9)	1 (3.7)	0 (0.0)
> 4	2 (5.9)	2 (7.4)	0 (0.0)
Total	34 (100.0)	27 (100.0)	7 (100.0)

Table 5.18. Youth hunters who watched a TV show, DVD, or video about deer hunting within the last year (n=34) and completed all aspects of the study.

In the sample of 43 respondents, 34 of 43 (79.1%) of youth participants indicated that they had played a video game about deer hunting in the last year (Table 5.19). In the initial sample of 34 youth participants that gamed about deer hunting, 29 (85.3%) were males and 5 (14.7%) were females. Of the respondents in the initial Background Survey sample that played video games, 21 of 34 (61.8%) played these games for less than 1 hour per week.

Time spent playing video games about deer hunting (hours/week)	Total # (%) (n=34)	Males # (%) (n=29)	Females # (%) (n=5)
< 1	21 (61.8)	18 (62.2)	3 (60.0)
1-2	3 (8.9)	3 (10.3)	0 (0.0)
2-3	7 (20.6)	6 (20.7)	1 (20.0)
3-4	2 (5.9)	1 (3.4)	1 (20.0)
> 4	1 (2.8)	1 (3.4)	0 (0.0)
Total	34 (100.0)	29 (100.0)	5 (100.0)

Table 5.19. Youth hunters who played video games about deer hunting within the last year (n=34) and completed all aspects of the study.

Outdoor activities were rated by the 43 youth participants using the Background Survey in an effort to provide baseline information about enjoyment of their prior experiences (Tables 5.20 to 5.28). For all activities, 67.4% indicated that they "Really Enjoyed" being in the outdoors (Table 5.20), 44.2% indicated that they "Really Enjoyed" watching wildlife (Table 5.21), 74.4% of youth respondents "Really Enjoyed" hunting (Table 5.22), 55.8% indicated that they "Really Enjoyed" fishing (Table 5.23), 30.2% indicated that they "Really Enjoyed" hiking (Table 5.24), 60.5% indicated that they "Really Enjoyed" camping (Table 5.25), 62.8% indicated that they "Really Enjoyed" shooting sports (Table 5.26), and 58.1% indicated that they "Really Enjoyed" sports (Table 5.27). Only 25.6% of youth participants indicated that they "Really Enjoyed" gaming and 14.0% indicated that they "Don't Enjoy" gaming at all (Table 5.28).

Being in the Outdoors	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	1 (2.3)	0 (0.0)	1 (11.1)
3	6 (14.0)	5 (14.7)	1 (11.1)
4	7 (16.3)	7 (20.6)	0 (0.0)
5 – Really Enjoy	29 (67.4)	22 (64.7)	7 (77.8)
Total	43	34	9
Average	4.49	4.50	4.44
(SD)	(0.83)	(0.75)	(1.13)

Table 5.20. Enjoyment of being in the outdoors to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Watching Wildlife			
C	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (2.3)	1 (2.9)	0 (0.0)
2	2 (4.7)	2 (5.9)	0 (0.0)
2	4 (0.2)	4 (11.0)	0 (0 0)
3	4 (9.3)	4 (11.8)	0 (0.0)
4	17 (39 5)	11 (32 3)	6 (667)
•	17 (59.5)	11 (52.5)	0 (00.7)
5 – Really Enjoy	19 (44.2)	16 (47.1)	3 (33.3)
5 5 5			
Total	43	34	9
Average	4.19	4.15	4.33
(SD)	(0.96)	(1.13)	(0.50)

Table 5.21. Enjoyment of watching wildlife to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Table 5.22. Enjoyment of hunting to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Hunting			
	1 otal # (%)	Males $\#$ (%)	Females $\#$ (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	4 (9.3)	3 (8.9)	1 (11.1)
4	7 (16.3)	6 (17.6)	1 (11.1)
5 – Really Enjoy	32 (74.4)	25 (73.5)	7 (77.8)
Total	43	34	9
Average (SD)	4.65 (0.65)	4.65 (0.65)	4.67 (0.71)

Fishing			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	3 (7.0)	3 (8.8)	0 (0.0)
3	8 (18.6)	6 (17.7)	2 (22.2)
4	8 (18.6)	7 (20.6)	1 (11.1)
5 – Really Enjoy	24 (55.8)	18 (52.9)	6 (66.7)
Total	43	34	9
Average (SD)	4.23 (1.00)	4.18 (1.03)	4.44 (0.88)

Table 5.23. Enjoyment of fishing to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Table 5.24. Enjoyment of hiking to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Hiking			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	4 (9.3)	3 (8.8)	1 (11.1)
2	4 (9.3)	3 (8.8)	1 (11.1)
3	10 (23.3)	10 (29.4)	0 (0.0)
4	12 (27.9)	8 (23.6)	4 (44.5)
5 – Really Enjoy	13 (30.2)	10 (29.4)	3 (33.3)
Total	43	34	9
Average	3.58	3.53	3.78
	(1.55)	(1.55)	(1.57)

Camping			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (2.3)	1 (2.9)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	7 (16.3)	6 (17.6)	1 (11.1)
4	9 (20.9)	9 (26.5)	0 (0.0)
5 – Really Enjoy	26 (60.5)	18 (53.0)	8 (88.9)
Total	43	34	9
Average (SD)	4.37 (0.93)	4.26 (0.96)	4.78 (0.67)

Table 5.25. Enjoyment of camping to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Table 5.26. Enjoyment of shooting sports to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Shooting Sports			
	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (2.3)	1 (2.9)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	2 (4.7)	2 (5.9)	0 (0.0)
4	13 (30.2)	10 (29.4)	3 (33.3)
5 – Really Enjoy	27 (62.8)	21 (61.8)	6 (66.7)
Total	43	34	9
Average (SD)	4.51 (0.80)	4.47 (0.86)	4.67 (0.50)

Sports	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	2 (4.7)	2 (5.9)	0 (0.0)
3	7 (16.3)	7 (20.6)	0 (0.0)
4	9 (20.9)	6 (17.6)	3 (33.3)
5 – Really Enjoy	25 (58.1)	19 (55.9)	6 (66.7)
Total	43	34	9
Average (SD)	4.33 (0.92)	4.24 (0.99)	4.67 (0.50)

Table 5.27. Enjoyment of sports to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Table 5.28. Enjoyment of gaming to youth respondents in the Background Survey data from those youth who completed all aspects of the study (n=43).

Gaming	$T_{atal} \# (0/)$	Moles $\#(9/)$	Equal $(0/)$
	10tal # (70)	Males # (70)	remates # (70)
1 – Don't Enjoy	6 (14.0)	4 (11.8)	2 (22.2)
2	5 (11.6)	5 (14.7)	0 (0.0)
3	12 (27.9)	8 (23.5)	4 (44.5)
4	9 (20.9)	8 (23.5)	1 (11.1)
5 – Really Enjoy	11 (25.6)	9 (26.5)	2 (22.2)
Tatal	42	24	0
10181	43	34	9
Average	3.33	3.38	3.11
(SD)	(1.36)	(1.35)	(1.45)

#### **Comparing Background Surveys for Non-Response Bias**

To determine whether there was any non-response bias, I compared the results of the initial Background Surveys (n=98) and completed Background Surveys (n=43) where youth participants also completed at least one ESM Hunting Survey, and the Hunting Experience and Background Survey were analyzed for response bias. The average age of all Background Surveys was 12.61 (SD – 0.99), whereas the average age of those youth respondents who completed the Background Survey, at least one ESM Hunting Survey, and the Overall Hunting Experience and Satisfaction Survey were 12.81 years of age (SD – 1.07) (Table 5.29).

A comparison of previous hunting partners where youth respondents could shoot indicated that, in general distributions between various family and friends were very similar among the initial Background Survey participants (n=98) and respondents that completed all aspects of the study (n=43) (Table 5.29). There was a noticeable difference (9.4%) between initial and full study background surveys with regard to "Dad" being the previous hunting partner (Table 5.30). One noticeable finding suggests that initial participants indicated that they had hunted with a brother, cousin, or friend. However those respondents that completed all aspects of the study did not hunt with these same individuals (Table 5.30). Further comparison of initial and completed data suggests there was a 5% difference in Apprentice Hunting License holders between the initial Background Survey (27.6%) and the completed Background Survey (32.6%) results (Table 5.29).

A comparison of previous hunting partners where youth respondents could not shoot indicated that, in general distributions between various family and friends were very similar among the initial Background Survey participants (n=98) and respondents that completed all aspects of the study (n=43) (Table 5.31). One notable characteristic suggests that initial

102

		Results for non-	-response bias
		Initial	Youth Who
		Background	Completed
		Survey	All
Analy	sis Criterion	Responses	Surveys
		(n=98)	(n=43)
Mean Age (SD)		12.61 (0.99)	12.81 (1.07)
% Who hunted with fath	er (Not shooting)	88.0	89.5
% Who purchased an Ap	oprentice Hunting License	27.6	32.6
% Who reported that bes	st friend hunted	49.0	54.8
% Who watched a TV sh	now about deer hunting	79.6	79.1
% Who gamed about dee	er hunting	59.0	79.1
% Who "Really Enjoyed	l"		
	The Outdoors	61.2	67.4
	Watching Wildlife	39.8	44.2
	Hunting	70.8	74.4
	Fishing	58.2	55.8
	Hiking	26.2	30.2
	Camping	56.1	60.5
	Shooting Sports	62.3	62.8
	Sports	66.3	58.1
	Gaming	31.7	25.6

Table 5.29. Analysis to investigate any potential non-response bias. Comparison of initial total youth respondents (n=98) with youth who completed all survey (n=43).

Previous	All Background Survey responses			Full study responses			
Hunting	Total #	Males #	Females #	Total #	Males #	Females #	
Partners	(%)	(%)	(%)	(%)	(%)	(%)	
	(n=55)	(n=46)	(n=9)	(n=38)	(n=33)	(n=5)	
		· · ·	• •	· ·	· · ·		
Mom	4	4	0	1	1	0	
	(7.3)	(8.7)	(0.0)	(2.6)	(3.0)	(0.0)	
Dad	50	41	9	30	25	5	
	(91.0)	(89.1)	(100.0)	(78.9)	(75.8)	(100.0)	
			· · · ·	( )	( )	× ,	
Brother	2	2	0	0	0	0	
	(3.6)	(4.3)	(0.0)	(0.0)	(0.0)	(0.0)	
		<b>x</b> ,					
Sister	0	0	0	0	0	0	
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	
	(000)	(000)	(000)	(000)	(000)	(***)	
Grandparent	10	10	0	5	5	0	
- · · · <b>I</b> · · · ·	(18.2)	(21.7)	(0.0)	(13.2)	(15.2)	(0.0)	
	(10.2)	()	(0.0)	(10.2)	(10.2)	(0.0)	
Aunt	0	0	0	0	0	0	
	(0 0)	(0 0)	(0 0)	(0 0)	(0 0)	(0, 0)	
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	
Uncle	4	4	0	2	2	0	
	(73)	(87)	(0 0)	(53)	(61)	(0, 0)	
	(,)	(017)	(0.0)	(0.0)	(0.1)	(0.0)	
Cousin	1	1	0	0	0	0	
	(18)	(22)	(0 0)	(0, 0)	(0,0)	(0, 0)	
	(110)	(=:=)	(0.0)	(0.0)	(0.0)	(0.0)	
Friend	2	2	0	0	0	0	
1 110114	(36)	$(4\bar{3})$	(0 0)	(0 0)	(0 0)	$(0 \ 0)$	
	(5.0)	(1.5)	(0.0)	(0.0)	(0.0)	(0.0)	
Neighbor	0	0	0	0	0	0	
	(0 0)	(0 0)	(0 0)	(0 0)	(0 0)	(0 0)	
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	
Total	55	46	9	38	33	5	

Table 5.30. Comparison of previous hunting partners where youth could not shoot in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey.

Note. Youth respondents could select multiple categories.

Previous	All Backg	round Surve	y responses	Full study responses			
Hunting	Total #	Males #	Females #	Total #	Males #	Females #	
Partners	(%)	(%)	(%)	(%)	(%)	(%)	
	(n=84)	(n=63)	(n=21)	(n=38)	(n=33)	(n=5)	
	×		, , , , , , , , , , , , , , , , , , ,	· · ·		` <i>, , , , , , , , , , , , , , , , , , ,</i>	
Mom	9	7	2	4	3	1	
	(10.7)	(11.1)	(9.5)	(10.5)	(9.1)	(20.0)	
		× ,	~ /				
Dad	74	55	19	34	29	5	
	(88.0)	(873)	(90.2)	(89.5)	(87.9)	$(100\ 0)$	
	(00.0)	(0,12)	() () -)	(0).0)	(0,13)	(100.0)	
Brother	3	2	1	1	0	1	
Diotilo	(3.6)	$(3\bar{2})$	(48)	(2, 6)	(0 0)	(200)	
	(5.0)	(3.2)	(1.0)	(2.0)	(0.0)	(20.0)	
Sister	4	3	1	1	1	0	
515(01	(18)	(18)	(18)	(26)	(30)	(0,0)	
	(4.0)	(4.8)	(4.0)	(2.0)	(5.0)	(0.0)	
Grandnarant	23	10	4	0	8	1	
Oranuparent	(27.4)	(20, 2)	(10,0)	(72 7)	(24.2)	(20,0)	
	(27.4)	(30.2)	(19.0)	(23.7)	(24.2)	(20.0)	
Aunt	0	0	0	0	0	0	
Aum	(0,0)	(0,0)	(0,0)	(0,0)	(0,0)	(0,0)	
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	
Unala	10	17	1	7	7	0	
Uncle	10	(27.0)	$(1 \circ)$	(10.4)	(21,2)	(0,0)	
	(21.4)	(27.0)	(4.8)	(18.4)	(21.2)	(0.0)	
Cousin	6	5	1	2	1	1	
Cousin	(7,1)	(7.0)	$(1 \ 0)$	(5,2)	(2 0)	(20,0)	
	(7.1)	(7.9)	(4.8)	(5.5)	(3.0)	(20.0)	
Emi and	C	F	1	0	0	0	
Friend	(7,1)	(70)	$(1 \circ)$	(0,0)	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	(0,0)	
	(7.1)	(7.9)	(4.8)	(0.0)	(0.0)	(0.0)	
Naiahl	2	1	1	0	0	0	
Neignbor	(2,4)		$(1 \circ)$	(0,0)	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	(0,0)	
	(2.4)	(1.6)	(4.8)	(0.0)	(0.0)	(0.0)	
Total	84	63	21	38	33	5	

Table 5.31. Comparison of previous hunting partners where youth could not shoot in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey.

Note. Youth respondents could select multiple categories.

participants who hunted with their brother or cousin also hunted with those same individuals who completed all aspects of the study (Table 5.31).

Based on the results of this study, there was a 5.8% difference in whether a youth respondents' best friend hunted between the initial Background Survey (49.0%) and the completed Background Survey (54.8%) results. However, there were only small differences between males and females who's best friends hunted between the initial sample (n=98) and the compete sample utilized for hypothesis testing (n=43).

A comparison of time spent watching a TV, DVD or Video about deer hunting in the initial Background Survey participants (n=98) and respondents that completed all aspects of the study (n=43) yielded no differences between initial Background Survey results and Completed Background Survey results data (Table 5.32).

A comparison of time spent playing video games about deer hunting in the initial Background Survey participants (n=98) and respondents that completed all aspects of the study (n=43) yielded no differences between initial Background Survey results and Completed Background Survey results data (Table 5.33).

A comparison of youth ratings of various recreational activities were analyzed based on the initial Background Survey participants (n=98) and respondents that completed the Background Survey, at least one ESM Hunting Survey, and the Hunting Experience and Satisfaction Survey (n=43) (Table 5.34). Average ratings of enjoyment of watching wildlife were lower for the initial sample of respondents than those that completed the Background Survey, at least one ESM Hunting Survey, and the Hunting Experience and Satisfaction at the conclusion of Michigan's Special Youth Deer Hunt (Table 5.34). In general, youth rated being in the outdoors, hunting, fishing, camping, shooting sports, and sports as "Enjoyable" or "Very Enjoyable"

106

(Table 5.34). Conversely, youth ratings of hiking and gaming were rated higher than the median of the rating scale, but lower than other recreational activities measured (Table 5.34).

Table 5.32. Comparison of time spent watching a TV, DVD, or Video about deer hunting in
initial Background Surveys and where all youth completed the Background Survey,
at least one ESM Survey and the Overall Experience and Satisfaction Survey.

Time spent	All Backg	round Surve	y responses	Full study responses			
watching a TV, DVD, or Video							
about deer	Total #	Males #	Females #	Total #	Males #	Females #	
hunting	(%)	(%)	(%)	(%)	(%)	(%)	
(hrs/wk)	(n=98)	(n=72)	(n=26)	(n=43)	(n=35)	(n=8)	
< 1	50 (61.7)	35 (59.3)	15 (68.2)	21 (61.8)	17 (63.0)	4 (57.1)	
1-2	23 (28.4)	16 (27.1)	7 (31.8)	10 (29.4)	7 (25.9)	3 (42.9)	
2-3	2 (2.5)	2 (3.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
3-4	2 (2.5)	2 (3.4)	0 (0.0)	1 (2.9)	1 (3.7)	0 (0.0)	
> 4	4 (4.9)	4 (6.8)	0 (0.0)	2 (5.9)	2 (7.4)	0 (0.0)	
Total	81	59	22	34	27	7	

Time spent	All Background Survey responses			Full study responses			
playing video games							
about deer	Total #	Males #	Females #	Total #	Males #	Females #	
hunting	(%)	(%)	(%)	(%)	(%)	(%)	
(hrs/wk)	(n=98)	(n=72)	(n=26)	(n=43)	(n=35)	(n=8)	
< 1	46 (59.0)	34 (55.7)	12 (70.6)	21 (61.8)	18 (62.2)	3 (60.0)	
1-2	13 (16.7)	12 (19.7)	1 (5.9)	3 (8.9)	3 (10.3)	0 (0.0)	
2-3	11 (14.1)	10 (16.4)	1 (5.9)	7 (20.6)	6 (20.7)	1 (20.0)	
3-4	3 (3.8)	2 (3.3)	1 (5.9)	2 (5.9)	1 (3.4)	1 (20.0)	
> 4	5 (6.4)	3 (4.9)	2 (11.7)	1 (2.8)	1 (3.4)	0 (0.0)	
Total	78	61	17	34	29	5	

Table 5.33. Comparison of time spent watching a TV, DVD, or Video about deer hunting in initial Background Surveys and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey.

Youth	Mean Initial Sample Ratings			Mean Con	Mean Completed Sample Ratings			
Ratings of	(n=98)				(n=43)			
Activities	Total #	Males #	Females #	Total #	Males #	Females #		
	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)		
Being in the outdoors	4.45	4.49	4.35	4.49	4.50	4.44		
	(0.79)	(0.75)	(0.89)	(0.83)	(0.75)	(1.13)		
Watching	3.99	4.00	3.96	4.19	4.15	4.33		
Wildlife	(1.03)	(1.10)	(0.87)	(0.96)	(1.13)	(0.50)		
Hunting	4.60	4.70	4.36	4.65	4.65	4.67		
	(0.67)	(0.60)	(0.81)	(0.65)	(0.65)	(0.71)		
Fishing	4.31	4.35	4.19	4.23	4.18	4.44		
	(0.99)	(0.99)	(1.02)	(1.00)	(1.03)	(0.88)		
Hiking	3.39	3.36	3.44	3.58	3.53	3.78		
	(1.35)	(1.73)	(1.33)	(1.33)	(1.33)	(1.39)		
Camping	4.35	4.34	4.38	4.37	4.26	4.78		
	(0.85)	(0.84)	(0.99)	(0.93)	(0.96)	(0.67)		
Shooting	4.44	4.49	4.35	4.51	4.47	4.67		
Sports	(0.86)	(0.83)	(0.94)	(0.80)	(0.86)	(0.50)		
Sports	4.43	4.46	4.38	4.33	4.24	4.67		
	(0.93)	(0.91)	(0.98)	(0.92)	(0.99)	(0.50)		
Gaming	3.56	3.56	3.54	3.33	3.38	3.11		
	(1.31)	(1.30)	(1.36)	(1.36)	(1.35)	(1.45)		

Table 5.34. Comparison of youth ratings of various recreational activities in initial Background Surveys (n=98) and where all youth completed the Background Survey, at least one ESM Survey and the Overall Experience and Satisfaction Survey (n=43).

## **Results from the Experience Sampling Method**

# **Hunting Experience**

Youth respondents who hunted at least once during Michigan's Special Youth Firearm Hunt (September 22 and 23, 2012) were asked to complete the ESM Hunting Survey for each time they went hunting. Of the original 98 youth who completed the Background Hunting Survey, 43 youth completed at least one ESM Hunting Survey and hunted 86 times on Saturday and Sunday. Of the youth respondents in this study that completed ESM Hunting Surveys, 25 of 86 (29.1%) hunts occurred Saturday morning, 29 of 86 (33.7%) hunts occurred Saturday afternoon, 17 of 86 (19.8%) hunts occurred Sunday morning, and 15 of 86 (17.4%) hunts occurred Sunday afternoon (Table 5.35). Youth respondents that did not hunt during the four hunting periods cited weather, other commitments, and harvested a deer as reasons for not going hunting or continuing to hunt during the 2012 Michigan Special Youth Deer Hunt.

Hunting Period	Number Of Hunts	% of all Hunts	Hunts By Males	% of Males' Hunts	Hunts By Female	% of Females' Hunts
Saturday AM	25	29.1	20	29.0	5	29.5
Saturday 71101	25	27.1	20	29.0	5	27.5
Saturday PM	29	33.7	23	33.3	6	35.3
Sunday AM	17	19.8	14	20.3	3	17.6
Sunday PM	15	17.4	12	17.4	3	17.6
	0.6	100.0	(0)	100.0	17	100.0
I otal Hunts	86	100.0	69	100.0	17	100.0

Table 5.35. Distribution of hunts by youth respondents who hunted Michigan's Special Whitetailed Deer Hunting periods on September 22 and 23, 2012 (n=43).

Of the 86 hunts that occurred during Michigan's Special Youth White-tailed Deer Hunt, 41 (47.7%) hunts occurred on the youth respondent's own property (Table 5.36). A smaller proportion (24.4%) occurred on property of a youth's relative (Table 5.36). Additionally, 16 hunts occurred on a friend's property and only 8 (9.3%) hunts occurred on public land (Table 5.36). Youth that hunted multiple times did not indicate hunting at different locations, only the first location cited in the ESM Hunting Experience Surveys. Males were more likely to hunt on their own property (53.7%), whereas female hunters were most likely to hunt on a friend's property (41.2%) (Table 5.36).

Table 5.36. Distribution of locations where youth respondents hunted during Michigan's	Special
White-tailed Deer Hunting periods on September 22 and 23, 2012 (n=43).	

Location of Hunting Experience	Total	%	Male	%	Female	%
	#		#		#	
Own Property	41	47.7	37	53.7	4	23.5
Relative's Property	21	24.4	16	23.2	5	29.4
Friend's Property	16	18.6	9	13.0	7	41.2
Public Land	8	9.3	7	10.1	1	5.9
Total	86	100.0	69	100.0	17	100.0

While hunting, youth were asked to report their thoughts during their hunting experiences. On 64 of 86 (74.4%) hunts, youth were thinking about the hunt (Table 5.37). Youth hunters were next most likely to be thinking about family. Youth thought about family during 9 of 86 (10.4%) hunts (Table 5.37). Although males and females thought about hunting the most,

While hunting youth hunters were thinking about	Total #	Total %	Males #	Males %	Female #	Females %
School	3	3.5	3	4.4	0	0.0
Home	1	1.2	0	0.0	1	5.6
Nature	8	9.3	3	4.4	5	27.8
Family	9	10.4	6	8.9	3	16.7
Friends	1	1.2	0	0.0	1	5.6
Hunting	64	74.4	56	82.3	8	44.3
Total	86	100.0	68	100.0	18	100.0

Table 5.37. Distribution of what youth hunters thought about while hunting during Michigan's Special White-tailed Deer Hunting periods on September 22 and 23, 2012 (n=43).

frequently females were more likely than males to think about nature while hunting on 5 of 18 (27.6%) hunts than any other activity measured (Table 5.37).

Youth reported that they saw 284 white-tailed deer over the two-day hunt (Table 5.38). Of the four hunting periods, the Saturday afternoon hunt had 120 (42.3%) visual sightings of white-tailed deer by youth respondents (Table 5.38). On average, youth participants saw 4.14 deer during the Saturday PM hunt (Table 5.38). Youth reported seeing 3.11 deer/day on the Saturday morning hunt, which accounted for 29.6% of the total number of deer seen (Table 5.38). Sunday AM and PM had the lowest number of deer seen at 45 (15.8%) and 35 (12.3%) animals respectively (Table 5.38). Additionally, the Saturday PM hunts held the most visual sightings of white-tailed deer for males (Average – 4.14 deer/day), while females on the Sunday PM hunt had the highest average visual sightings of deer at 3.00 deer/day.

During youth hunting experiences, 63 of 86 (73.3%) experiences indicated that youth had heard deer or other animals that they could not see. Other animals seen that were most commonly mentioned by youth hunters included: squirrels, raccoons, chipmunks, turkeys and songbirds.

Total deer seen during the Michigan Saturday Saturday Sunday Sunday Total white-tailed deer youth hunt AM PM AM PM Total number of deer seen each 84 45 35 284 120 hunting period Total number of hunters during each 27 29 17 15 88 hunting period Average number of deer seen by each 3.11 4.14 2.65 2.33 3.23 hunter Total number of deer seen by male 74 40 26 250 110 hunters Total number of male hunters during 21 23 14 12 70 each hunting period Average number of deer seen by male 3.52 4.78 2.86 2.17 3.57 hunters Total number of deer seen by female 10 10 5 9 34 hunters Total number of female hunters during 6 6 3 3 18 each hunting period Average number of deer seen by 1.67 1.67 1.67 3.00 1.89 female hunters

Table 5.38. Distribution of white-tailed deer seen by youth deer hunting respondents that hunted Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 (n=43).

Of the sample of 43 youth deer hunters who reported on their hunting experiences, 29 of 43 (67.4%) indicated that they had shot at a white-tailed deer during the hunt (Table 5.39). Five of 43 hunters (all males) indicated that they had hit a deer, but could not find the animal (11.6%). Of the 43 youth deer hunters, 16 (37.2%) indicated they had harvested and tagged a deer during Michigan's Special White-tailed Deer Youth Hunt (Table 5.39). Of the 16 successful hunters, 12 (27.9%) tagged a buck with one or both antlers at least 3 inches in length, 3 (7.0%) hunters tagged a doe (Table 5.39).

Sixteen young hunters were successful during this study, and of those 16 successful youth hunters, 8 (50.0%) youth rated their experience of finding the deer after harvest as "Good," while 8 (50.0%) youth rated the same experience as "Very Good" (Table 5.40). On average, youth hunters rated the experience of finding the animal after the harvest at 4.50 (SD – 0.52) on a scale of 1 to 5 (Table 5.40).

Of the 16 successful youth hunters, 8 (50.0%) youth rated their experience of field dressing the deer after harvest as "Good," while 7 (43.8%) youth rated the same experience as "Very Good" (Table 5.41). On average, youth hunters rated the experience of field dressing the animal after the harvest at 4.37 (SD – 0.60) on a scale of 1 to 5 (Table 5.41). Notably, only one youth male hunter rated their experience of field dressing the deer after harvest as "OK" (Table 5.41).

Deer shot at, missed, hit but could not find, tagged, and type of deer.	Total (n=43)	%	Male (n=35)	%	Female (n=8)	%
Shot at a deer	29	67.4	25	71.4	4	50.0
Missed a deer	8	18.6	5	14.3	3	37.5
Hit a deer but could not find it	5	11.6	5	14.3	0	0.0
Shot and tagged a deer	16	37.2	15	42.9	1	12.5
Tagged a deer with one or both antlers 3 inches or longer	12	27.9	11	31.4	1	12.5
Tagged a deer with antlers smaller than 3 inches	3	7.0	3	8.6	0	0.0
The tagged deer was a doe	1	2.3	1	2.9	0	0.0
Total Youth Respondents	43		35		8	

Table 5.39. Youth respondents who shot at, hit a deer, tagged a deer, and the type of deer harvested during Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 by gender (n=43).



Youth Respondent Hunting Experiences during the Michigan Special Youth Deer Hunt

Figure 5.2. Youth respondents who shot at, hit a deer, tagged a deer, and the type of deer harvested during Michigan's Special White-tailed Deer Hunt on September 22 and 23, 2012 (n=43).

Rating the experience of			
finding the deer after			
harvest?	Total # (%)	Males # (%)	Females # (%)
1 – Very Bad	0 (0.0)	0 (0.0)	0 (0.0)
2 – Bad	0 (0.0)	0 (0.0)	0 (0.0)
3 – OK	0 (0.0)	0 (0.0)	0 (0.0)
4 – Good	8 (50.0)	8 (53.3)	0 (0.0)
5 – Very Good	8 (50.0)	7 (46.7)	1(100.0)
Total	16	15	1
Average	4.42	4.33	4.44
(SD)	(0.51)	(0.58)	(0.51)

Table 5.40. Youth participant ratings of the experience of finding that deer after harvest (n=16).

Table 5.41. Youth participant ratings of the experience of field dressing the deer after harvest (n=16).

Rating the experience of field dressing the deer	Total # (%)	Males $\#(9/2)$	Females # (%)
alter harvest?	10tal # (70)	$\frac{1}{1000}$	Tennales # (76)
1 – Very Bad	0 (0.0)	0 (0.0)	0 (0.0)
2 – Bad	0 (0.0)	0 (0.0)	0 (0.0)
3 – OK	1 (6.3)	1 (6.6)	0 (0.0)
4 – Good	8 (50.0)	7 (46.7)	1 (100.0)
5 – Very Good	7 (43.7)	7 (46.7)	0 (0.0)
Total	16	15	1
	4.27	4.20	4.22
Average	4.37	4.38	4.33
(SD)	(0.60)	(0.62)	(0.58)

### **Indicators of Flow**

Youth participants indicated how they felt about the hunt during each of the hunting periods (Saturday AM, Saturday PM, Sunday AM, and Sunday PM) (Tables 5.42 to 5.49). Two youth did not respond to the questions in Tables 5.42 to 5.49. Of the 41 youth respondents who recorded 84 hunting experiences, 10 (11.9%) felt "Very Much" challenged by their hunting experience while 11 (13.1%) did not feel at all challenged during the hunt (Table 5.42). On average, youth hunters rated their perceived challenge of the hunt at 3.30 (SD – 1.19) on a scale of 1 to 5 (Table 5.42). Additionally, males rated their perceived challenge higher (3.47, SD – 1.08) than females (2.67, SD – 1.37) (Table 5.42).

Of the purposeful sample of youth respondents across 84 recorded hunting experiences, 28 (33.3%) felt that their hunting experience was "Very Much" important to them (Table 5.43). Additionally, only 1 (1.2%) youth hunter did not feel that the hunting experience was important to them (Table 5.43). On average, youth hunters rated their perceived importance of the hunt at 3.88 (SD – 0.97) on a scale of 1 to 5 (Table 5.43). Additionally, females rated their average perceived importance of the hunt higher (4.11, SD – 0.76) than males (3.82, SD – 1.02) (Table 5.43). Twenty-five (29.8%) of the youth respondents in this study felt "Very Much" that they had the adequate skills to participate in the hunting experience (Table 5.44). Additionally, only 3 (3.6%) of youth hunters did not feel that had the adequate skills to participate during their hunting experiences (Table 5.44). On average, youth hunters rated their perceived skill level of the hunt at 3.67 (SD – 1.10) on a scale of 1 to 5 (Table 5.44). Additionally, females and males rated their average perceived skill level on the hunt at the same level (3.67) with standard deviations for males at 1.14 and females at 0.97 (Table 5.44).

How challenging	(	Challenge Indicator			
was the hunting					
experience?	Total # (%)	Males # (%)	Females # (%)		
1 – Not At All	11 (13.1)	5 (7.6)	6 (33.2)		
2	7 (8.3)	6 (9.1)	1 (5.6)		
3	22 (26.2)	17 (25.8)	5 (27.8)		
4	34 (40.5)	29 (43.9)	5 (27.8)		
5 – Very Much	10 (11.9)	9 (13.6)	1 (5.6)		
Total	84	66	18		
Average	3.30	3.47	2.67		
(SD)	(1.19)	(1.08)	(1.37)		

Table 5.42. Youth participant ratings of the perceived challenge of the hunting experience (n=84).

During 47 of 84 (56.0%) hunting experiences by youth, participants rated that they did not wish to be doing something else during the hunt (Table 5.45). Interestingly, only 2 of 84 (2.4%) hunting experiences were recorded where the participant wished "Very Much" that they had been doing something else rather than deer hunting (Table 5.45). On average, youth hunters rated their perceived desire to be doing something other than deer hunting at 1.70 (SD – 1.00) on a scale of 1 to 5 (Table 5.45). Additionally, females rated their average perceived wish that they had been doing something else other than hunting during the hunt higher (2.11, SD – 1.37) than males (1.59, SD – 0.86) (Table 5.45).

During 35 of 84 (41.6%) hunting experiences by youth, participants rated "Very Much" that the hunting experience was interesting (Table 5.46). Only 1 of 84 (1.2%) hunting

How important was	In	volvement Indica	tor
this hunting	Total Hunts	Male Hunts	Female Hunts
experience to you?	# (%)	# (%)	# (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	4 (4.8)	4 (6.1)	0 (0.0)
3	27 (32.1)	23 (34.8)	4 (22.2)
4	24 (28.6)	16 (24.3)	8 (44.4)
5 – Very Much	28 (33.3)	22 (33.3)	6 (33.4)
Total	84	66	18
Average (SD)	3.88 (0.97)	3.82 (1.02)	4.11 (0.76)

Table 5.43. Youth participant ratings of the perceived importance (involvement indicator) of the hunting experience (n=84).

experiences were recorded where the participant did not think the hunting experience was interesting at all (Table 5.46). On average, youth hunters rated their perceived hunting experience as interesting at 4.20 (SD – 0.83) on a scale of 1 to 5 (Table 5.46). Additionally, females rated their average perceived importance of the hunt higher (4.28, SD – 0.75) than males (4.18, SD – 0.86) (Table 5.46).

During 45 of 84 (53.6%) hunting experiences by youth, participants rated "Very Much" that the hunting experience was important to their future goals (Table 5.47). No youth hunters felt that hunting would not be important to their future goals (Table 5.47). On average, youth hunters rated their perceived importance of the hunt to their future at 4.29 (SD – 0.86) on a scale of 1 to 5 (Table 5.47). Additionally, females rated their average perceived importance of the hunt to their future goals higher (4.33, SD – 0.84) than males (4.27, SD – 0.87) (Table 5.47).

How skilled did you	Skill Indicator		
feel on this hunt?	Total Hunts	Male Hunts	Female Hunts
	# (%)	# (%)	# (%)
1 – Not At All	3 (3.6)	3 (4.5)	0 (0.0)
2	7 (8.3)	6 (9.1)	1 (5.6)
3	30 (35.7)	21 (31.9)	9 (50.0)
4	19 (22.6)	16 (24.2)	3 (16.7)
5 – Very Much	25 (29.8)	20 (30.3)	5 (27.7)
Total	84	66	18
Average	3.67	3.67	3.67
(SD)	(1.10)	(1.14)	(0.97)

Table 5.44. Youth participant ratings of the perceived skill of the hunting experience (n=84).

Table 5.45. Youth participant ratings of wishing they had been doing something else (intrinsic motivation indicator) rather than the hunting experience (n=84).

Did you wish you	Intrins	Intrinsic Motivation Indicator		
had been doing	Total Hunts	Male hunts	Female Hunts	
something else?	# (%)	# (%)	# (%)	
1 – Not At All	47 (56.0)	39 (59.1)	8 (44.4)	
2	24 (28.5)	19 (28.7)	5 (27.8)	
3	6 (7.1)	4 (6.1)	2 (11.1)	
4	5 (6.0)	4 (6.1)	1 (5.6)	
5 – Very Much	2 (2.4)	0 (0.0)	2 (11.1)	
Total	84	66	18	
Average	1.70	1.59	2.11	
(SD)	(1.00)	(0.86)	(1.37)	

Across the 84 hunts measured from the 43 respondents, 49 (58.3%) responses indicated "Very Much" that young hunters would talk about their hunt with friends (Table 5.48). On average, youth hunters rated their perceived willingness to talk with friends about the hunt at 4.40 (SD – 0.82) on a scale of 1 to 5 (Table 5.48). Additionally, males rated their average perceived willingness to talk with friends about the hunt higher (4.42, SD – 0.84) than females (4.33, SD – 0.77) (Table 5.48). Conversely, 54 of 84 (64.3%) responded "Very Much" when asked whether they would talk about their hunt with family (Table 5.49). On average, youth hunters rated their perceived willingness to talk with family about the hunt at 4.48 (SD – 0.80) on a scale of 1 to 5 (Table 5.49). Additionally, males rated their average perceived willingness to talk with family about the hunt at 4.48 (SD – 0.80) on a scale of 1 to 5 (Table 5.49). Additionally, males rated their average perceived willingness to talk with family about the hunt higher (4.22, SD – 0.88) (Table 5.49).

Was this hunting	Merging Ac	tion and Awarene	ess Indicator
experience	Total Hunts	Male Hunts	Female Hunts
interesting?	# (%)	# (%)	# (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	1 (1.2)	1 (1.5)	0 (0.0)
3	13 (15.5)	10 (15.2)	3 (16.7)
4	34 (40.5)	27 (40.9)	7 (38.8)
5 – Very Much	35 (41.6)	27 (40.9)	8 (44.5)
Total	84	66	18
Average (SD)	4.20 (0.83)	4.18 (0.86)	4.28 (0.75)

Table 5.46. Youth participant ratings of finding the hunting experience interesting (Merging Action and Awareness Indicator) (n=84).

How important is	Concentration On Task at Hand Indicator			
hunting to your	Total Hunts	Male Hunts	Female Hunts	
future goals?	# (%)	# (%)	# (%)	
1 – Not At All	0 (0.0)	0 (0.0)	0 (0.0)	
2	1 (1.2)	1 (1.5)	0 (0.0)	
3	19 (22.6)	15 (22.7)	4 (22.2)	
4	19 (22.6)	15 (22.7)	4 (22.2)	
5 – Very Much	45 (53.6)	35 (53.1)	10 (55.6)	
Total	84	66	18	
Average (SD)	4.29 (0.86)	4.27 (0.87)	4.33 (0.84)	

Table 5.47. Youth participant ratings of how important hunting is to their future goals (Concentration On Task at Hand Indicator) (n=84).

Table 5.48. Youth participant ratings of will they talk about their hunts with friends (Self Esteem - Peer Expectation Indicator) (n=84).

Will you talk about	Self Esteem – Peer Expectation Indicator			
this hunt with	Total Hunts	Male Hunts	Female Hunts	
friends?	# (%)	# (%)	# (%)	
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)	
2	0 (0.0)	0 (0.0)	0 (0.0)	
3	12 (14.3)	9 (13.7)	3 (16.7)	
4	22 (26.2)	16 (24.2)	6 (33.3)	
5 – Very Much	49 (58.3)	40 (60.6)	9 (50.0)	
Total	84	66	18	
Average (SD)	4.40 (0.82)	4.42 (0.84)	4.33 (0.77)	

Will you talk about	Self Esteem – Family Expectation Indicator			
this hunt with	Total Hunts	Male Hunts	Female Hunts	
family?	# (%)	# (%)	# (%)	
1 – Not At All	0 (0.0)	0 (0.0)	0 (0.0)	
2	2 (2.4)	2 (3.0)	0 (0.0)	
3	10 (11.9)	5 (7.6)	5 (27.8)	
4	18 (21.4)	14 (21.2)	4 (22.2)	
5 – Very Much	54 (64.3)	45 (68.2)	9 (50.0)	
Total	84	66	18	
Average (SD)	4.48	4.55	4.22	
(3D)	(0.80)	(0.77)	(0.88)	

Table 5.49. Youth participant ratings of how likely they will talk about their hunts with family (Self Esteem - Family Expectation Indicator) (n=84).

Youth participants indicated their perceived enjoyment level during each of the hunting periods (Saturday AM, Saturday PM, Sunday AM, and Sunday PM) (Tables 5.50 to 5.55). Of the 43 youth respondents that recorded 84 hunting experiences, 40 (47.6%) indicated "Very Much" enjoyment of the hunting experience, while 1 (1.2%) was "Not At All" interested in the enjoyment of the hunting experience (Table 5.50). On average, youth hunters rated their perceived enjoyment of the hunt at 4.37 (SD – 0.77) on a scale of 1 to 5 (Table 5.50). Additionally, females rated their average perceived enjoyment of the hunting experience higher (4.33, SD – 0.83) than males (4.50, SD – 0.51) (Table 5.50).

Youth were also asked to rate their interest in each of the hunting experiences. Forty-five of 84 (53.5%) hunting experiences were perceived as "Very Much" interesting (Table 5.51). On average, youth hunters rated perceived interest in each of the hunts at 4.25 (SD – 1.01) on a scale

of 1 to 5 (Table 5.51). Additionally, females rated their average perceived interest in the hunting experience higher (4.44, SD – 0.78) than males (4.20, SD – 1.06) (Table 5.51).

Eighty-four hunts were measured from the 43 respondents, 44 (52.4%) hunt responses indicated "Very Much" that young hunters perceived they were doing the best they could while hunting (Table 5.52), whereas only 1 of 84 (1.2%) perceived that they were not doing the best they could during the hunting experience (Table 5.52). On average, youth hunters rated their perceived ability of doing the best they could do during the hunt at 4.32 (SD – 0.89) on a scale of 1 to 5 (Table 5.52). Additionally, females rated their average perceived ability to do the best they could do during the hunting experience higher (4.39, SD – 0.70) than males (4.30, SD – 0.94) (Table 5.52).

Did you enjoy this	Self Esteem	- Own Expectati	on Indicator
hunting experience?	Total Hunts	Male Hunts	Female Hunts
	# (%)	# (%)	# (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	5 (6.0)	5 (7.6)	0 (0.0)
4	38 (45.2)	29 (43.9)	9 (50.0)
5 – Very Much	40 (47.6)	31 (47.0)	9 (50.0)
Total	84	66	18
Average (SD)	4.37 (0.77)	4.33 (0.83)	4.50 (0.51)

Table 5.50. Youth participant ratings of their own expectations during the hunting experience (Self Esteem – Own Expectations) (n=84).

Was this hunting experience interesting?	Total Hunts # (%)	Male Hunts # (%)	Female Hunts # (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	4 (4.8)	4 (6.1)	0 (0.0)
3	12 (14.3)	9 (13.6)	3 (16.7)
4	22 (45.2)	18 (27.3)	4 (22.2)
5 – Very Much	45 (47.6)	34 (51.5)	11 (61.1)
Total	84	66	18
Average (SD)	4.25 (1.01)	4.20 (1.06)	4.44 (0.78)

Table 5.51. Youth participant ratings of their interest in the hunting experience (n=84).

Table 5.52. Youth participant ratings of their interest in feeling as though they were doing the best that they could on the hunt (n=84).

Did you do the best you could on this hunt?	Total Hunts # (%)	Male Hunts # (%)	Female Hunts # (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	1 (1.2)	1 (1.5)	0 (0.0)
3	11 (13.1)	9 (13.6)	2 (11.1)
4	27 (32.1)	20 (30.4)	7 (38.9)
5 – Very Much	44 (52.4)	35 (53.0)	9 (50.0)
Total	84	66	18
Average	4.32	4.30	4.39
(SD)	(0.89)	(0.94)	(0.70)

Of the same sample of youth respondents across 84 recorded hunting experiences, 34 (40.5%) youth felt that they were "Very Much" in control of their hunting experience (Table 5.53). Additionally, on 5 (6.0%) of the hunts youth did not feel as though they were in control of the hunt (Table 5.53). On average, youth hunters rated perception of control during the hunt at 3.90 (SD - 1.24) on a scale of 1 to 5 (Table 5.53). Additionally, females rated their average perceived feeling of being in control of the hunting experience higher (4.06, SD – 1.11) than males (3.86, SD – 1.28) (Table 5.53).

Did you feel in	Paradox of Control Indicator		
control of this	Total Hunts	Male Hunts	Female Hunts
hunting experience?	# (%)	# (%)	# (%)
1 – Not At All	5 (6.0)	4 (6.1)	1 (5.6)
2	8 (9.5)	8 (12.1)	0 (0.0)
3	10 (11.9)	6 (9.1)	4 (22.2)
4	27 (32.1)	22 (33.3)	5 (27.8)
5 – Very Much	34 (40.5)	26 (39.4)	8 (44.4)
Total	84	66	18
Average (SD)	3.90 (1.24)	3.86	4.06

Table 5.53. Youth participant ratings of their interest in feeling in control of the hunting experience (Paradox of Control Indicator) (n=84).

During 38 of 84 (45.2%) hunting experiences by youth, participants reported that they felt good about themselves by indicating "Very Much" during the hunt (Table 5.54). Interestingly, only 2 of 84 (2.4%) hunting experiences were recorded where the participants did not feel good about themselves during the hunting experience (Table 5.54). On average, youth hunters rated perceptions about how they felt on the hunt at 4.18 (SD – 1.00) on a scale of 1 to 5 (Table 5.54). Additionally, females rated their average perceived feeling about themselves during the hunting experience higher (4.28, SD – 0.75) than males (4.05, SD – 1.06) (Table 5.54).

During 44 of 84 (52.4%) hunting experiences by youth, participants responded "Very Much" that they felt as though they were getting better at hunting (Table 5.55). Only 1 of 84 (1.2%) hunting experiences were recorded where the participant did not think they were

D:1 (1 1			
Did you feel good			
about vourself	Total Hunts	Male Hunts	Female Hunts
when hunting?	# (%)	# (%)	# (%)
when nunting:	"('0)	n (70)	n (70)
1 – Not At All	2 (2.4)	2 (3.0)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	15 (17.9)	12 (18.2)	3 (16.7)
4	29 (34.5)	22 (33.3)	7 (38.9)
5 – Very Much	38 (45.2)	30 (45.5)	8 (44.4)
Total	84	66	18
Average	4.18	4.05	4.28
(SD)	(1.00)	(1.06)	(0.75)
	· /	```	` /

Table 5.54. Youth participant ratings of their interest in how good they felt about themselves during the hunting experience (n=84).

Are you getting better at hunting?	Total Hunts # (%)	Male Hunts # (%)	Female Hunts # (%)
1 – Not At All	1 (1.2)	1 (1.5)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	12 (14.3)	11 (16.7)	1 (5.6)
4	27 (32.1)	17 (25.7)	10 (55.6)
5 – Very Much	44 (52.4)	37 (56.1)	7 (38.8)
Total	84	66	18
Average (SD)	4.33 (0.87)	4.33 (0.93)	4.33 (0.59)

Table 5.55. Youth participant ratings of their interest if they felt they were getting better at hunting (n=84). Two youth did not respond to this question.

getting better at hunting (Table 5.55). On average, youth hunters rated perceptions of getting better at hunting while on the hunt at 4.33 (SD – 0.87) on a scale of 1 to 5 (Table 5.55). Additionally, females and males rated their average perceived level of getting better at hunting at the same level (4.33) with standard deviations for males at 0.93 and females at 0.59 (Table 5.55).

# **Mood Ratings**

Youth participants reflected on their mood during each of the hunting periods (Saturday AM, Saturday PM, Sunday AM, and Sunday PM) (Table 5.56). Of the 43 youth respondents that recorded 84 hunting experiences, 74 (88.1%) indicated that they were "Happy" or "Very Happy" while hunting with an average rating of 4.30 (SD – 0.70) on a scale of 1 to 5 (Table 5.56).
Additionally, males rated their average perceived happiness during the hunting experience higher (4.32, SD - 0.71) than females (4.22, SD - 0.73) (Table 5.56).

During 59 of 84 (70.2%) youth hunting experiences, participants rated themselves as either "Active" or "Very Active" while hunting with an average rating of 3.92 on a scale of 1 to 5 (SD – 1.03) (Table 5.56). Additionally, females rated their average perceived activeness during the hunting experience higher (4.44, SD – 0.51) than males (3.77, SD – 1.09) (Table 5.56).

Of the sample of youth respondents across 83 recorded hunting experiences, 51 (61.4%) rated themselves as feeling "Proud" or "Very Proud." Additionally, only 1 of 83 (1.2%) hunting experiences by youth rated themselves as "Not Proud" of the hunting experience while hunting with an average rating of 3.80 (SD - 1.00) on a scale of 1 to 5 (Table 5.56). Additionally, females rated their average perception of being proud during the hunting experience higher (3.89, SD – 0.83) than males (3.71, SD – 1.13) (Table 5.55). One respondent did not answer this question.

During 53 of 82 (64.6%) youth hunting experiences, participants rated themselves as either "Relaxed" or "Very Relaxed" while hunting with an average rating of 3.71 (SD - 1.26) (Table 5.55). Additionally, females rated their average perception of being relaxed during the hunting experience higher (3.94, SD – 1.21) than males (3.53, SD – 1.41) (Table 5.55). Two respondents did not answer this question.

Of the same sample of youth respondents across 82 recorded hunting experiences, 53 (64.6%) rated themselves as feeling "Strong" or "Very Strong." 1 of 82 (1.2%) hunting experiences by youth rated themselves as "Not Strong" during the hunting experience while hunting with an average rating of 3.89 (SD – 0.98) (Table 5.55). Additionally, males rated their

average perception of being strong during the hunting experience higher (3.82, SD - 1.08) than females (3.72, SD - 1.36) (Table 5.56).

During 46 of 78 (58.9%) hunting experiences by youth, participants rated themselves as either "Sociable" or "Very Sociable" while hunting with an average rating of 3.58 (SD – 1.25) (Table 5.56). Additionally, females rated their average perception of being sociable during the hunting experience higher (3.83, SD – 0.92) than males (3.17, SD – 1.61) (Table 5.56). Six respondents did not answer this question.

During this study of youth respondents across 80 recorded hunting experiences, 67 (83.8%) rated themselves as feeling "Excited" or "Very Excited" during the hunting experience with an average rating of 4.18 (SD – 0.89) (Table 5.56). Additionally, females rated their average perception of being excited during the hunting experience higher (4.39, SD – 1.20) than males (3.92, SD – 1.26) (Table 5.56). Four respondents did not answer this question.

Finally, of the 80 respondents that rated themselves on friendliness during the hunting experience, 62 of 80 (77.5%) perceived themselves as being "Friendly" or "Very Friendly during their hunting experiences with an average rating of 4.09 (SD – 1.01) (Table 5.56). Additionally, females rated their average perception of being friendly during the hunting experience higher (4.06, SD – 1.39) than males (3.83, SD – 1.31) (Table 5.56). Four respondents did not answer this question.

Mood	Μ	lood Ratir	igs of You	th White-t	ailed Deer	r Hunters D	Ouring Hu	nts
Туре	Not		Neither		Very			
						Overall	Male	Female
	1	2	3	4	5	Hunts	Hunts	Hunts
	(%)	(%)	(%)	(%)	(%)	Avg.	Avg.	Avg.
						(SD)	(SD)	(SD)
Нарру	0	1	9	38	36	4.30	4.32	4.22
	(0.0)	(1.2)	(10.7)	(45.2)	(42.9)	(0.70)	(0.71)	(0.73)
		0		•	• •		- <b></b>	
Active	l	9	15	30	29	3.92	3.77	4.44
	(1.2)	(10.7)	(17.9)	(35.7)	(34.5)	(1.03)	(1.09)	(0.51)
Droud	1	7	24	27	24	2 20	2 71	2 80
Floud	(1 2)	(95)	(29.0)	(22.5)	(29.0)	(1.00)	3.71 (1.12)	(0.92)
	(1.2)	(0.3)	(20.9)	(32.3)	(28.9)	(1.00)	(1.13)	(0.83)
Relaxed	7	8	14	26	27	3 71	3 53	3 94
	(8.5)	(9.8)	(17.1)	(31.7)	(32.9)	(1.26)	(1.41)	(1.21)
	()	()		()	()			
Strong	1	5	23	26	27	3.89	3.82	3.72
C	(1.2)	(6.1)	(28.1)	(31.7)	(32.9)	(0.98)	(1.08)	(1.36)
Sociable	8	6	18	26	20	3.58	3.17	3.83
	(10.3)	(7.7)	(23.1)	(33.3)	(25.6)	(1.25)	(1.61)	(0.92)
		_	_					
Excited	1	3	9	31	36	4.18	3.92	4.39
	(1.3)	(3.8)	(11.2)	(38.7)	(45.0)	(0.89)	(1.26)	(1.20)
Friendly	r	5	11	20	22	1 00	2 0 2	1 06
ritenuty	$(25)^{2}$	(6.2)	(12.7)	27 (26-2)	(112)	4.09	3.03	(1.20)
	(2.3)	(0.5)	(13.7)	(30.2)	(41.5)	(1.01)	(1.51)	(1.39)

Table 5.56. Mood ratings perceived by youth white-tailed deer hunters during Michigan's Special Youth White-tailed Deer Hunt.

## Youth Hunting Experience and Satisfaction

Satisfaction of the overall hunting experience was measured using questions from the Hunting Experience and Satisfaction instrument (Appendix I). One of the 43 participants did not provide ratings for the overall experience and satisfaction of the hunt. Nearly half (19 of 42 or 45.2%) of youth respondents rated their overall hunting experience as "Really Enjoyable" with an average rating of 4.17 (SD – 0.85) on a scale of 1 to 5 (Table 5.57). Additionally, none of the youth participants rated their hunting experience as "Didn't Enjoy" (Table 5.57). Finally, males rated their average perception of their overall hunting experience higher (4.32, SD – 0.81) than females (3.50, SD – 0.76) (Table 5.57). Of the 42 participants, 15 (35.7%) indicated that "shooting a deer" was the one most important reason for their overall hunting experience rating (Table 5.58).

Rating the overall hunting experience	Total # (%)	Males # (%)	Females # (%)
	$101a1 \pi (70)$	$\pi(70)$	Temates $\#(70)$
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	0 (0.0)	0 (0.0)	0 (0.0)
3	12 (28.6)	7 (20.6)	5 (62.5)
4	11 (26.2)	9 (26.5)	2 (25.0)
5 – Really Enjoy	19 (45.2)	18 (52.9)	1 (12.5)
Total	42	34	8
Average (SD)	4.17 (0.85)	4.32 (0.81)	3.50 (0.76)

Table 5.57. Ratings of the overall hunting experience by youth hunters (n=42).

Ten of 42 (23.8%) youth participants rated their perceived preparation toward their hunting experience as "Really Enjoyable" with an average rating of 3.69 (SD – 0.92) on a scale of 1 to 5 (Table 5.59). Finally, females rated their average felt perception overall during the hunting experience higher (3.88, SD – 1.13) than males (3.65, SD – 0.88) (Table 5.58). Of the 42 participants, 13 (31.0%) indicated that they "prepared a lot" as the one most important reasons for their overall hunting experience rating (Table 5.60).

Youth respondents rated their perceived comfort level during the hunting experience. Eleven of 42 (26.2%) youth rated their comfort level as "Really Enjoyable" during their hunting experiences with an average rating of 3.98 (SD – 0.81) (Table 5.61). Finally, females rated their average perceived comfort level during the hunting experience higher (4.00, SD – 0.93) than males (3.97, SD – 0.80) (Table 5.61). Of the 42 participants, 16 (38.1%) indicating that they felt "good/enjoyment/fun" as the one most important reason for their overall hunting experience rating (Table 5.62). In general, in south central and southern Michigan the weather on Saturday was overcast with scattered rain showers and a high of 50°F. On Sunday of Michigan's Special Youth White-tailed Deer Hunt, the weather was mostly sunny with a high temperature of 50°F.

Of the 42 respondents who answered questions rating the amount of deer seen during the youth hunt, 9 of 42 (21.4%) young hunters "Really Enjoyed" the number of deer seen during the overall hunting experience (Table 5.63). Interestingly, 9 of 42 (21.4%) indicated that they "Didn't Enjoy" the number of deer seen. The average rating for number of deer seen was 3.05 (SD - 1.45) on a scale of 1 to 5 (Table 5.63). Finally, males rated their average perceived number of deer seen during the hunting experience higher (3.15, SD – 1.46) than females (2.63, SD – 1.41) (Table 5.63). Of the 42 participants, 9 (21.4%) indicated that they "saw lots/saw many deer" as the one most important reason for their overall hunting experience rating (Table 5.64).

Youth respondents rated perceived time spent with their hunting partner during the overall hunting experience. Of the 42 youth participants, 23 (54.7%) rated the time spent with their hunting partner as "Really Enjoyable" (Table 5.65). Additionally, 1 of 42 (2.4%) "Didn't Enjoy" the overall hunting experience with their hunting partner. Overall hunting experiences with hunting partners were rated with an average score of 4.33 (SD – 0.93) on a scale of 1 to 5 (Table 5.65). Finally, males rated their average time spent with their hunting experience partner higher (4.35, SD – 0.98) than females (4.25, SD – 0.71) (Table 5.65). Of the 42 participants, 13 (31.0%) indicated that they "felt good about spending time with their hunting partner" as the one most important reason for their overall hunting experience rating (Table 5.66).

What is the one most important reason for your answer about the			
overall experience?	Total # (%)	Males # (%)	Females # (%)
"Shooting a deer"	15 (35.7)	14 (41.2)	1 (12.5)
"Fun"	6 (14.3)	3 (8.8)	3 (37.5)
"Saw a deer"	5 (11.9)	5 (14.7)	0 (0.0)
"Missed a deer"	2 (4.8)	1 (2.9)	1 (12.5)
No comment provided	14 (33.3)	11 (32.4)	3 (37.5)
Total	42	34	8

Table 5.58. Youth responses of the one most important reason for their overall hunting ratings (n=42).

Rating how			
prepared you felt during the hunt	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	3 (7.1)	2 (5.9)	1 (12.5)
3	17 (40.5)	15 (44.1)	2 (25.0)
4	12 (28.6)	10 (29.4)	2 (25.0)
5 – Really Enjoy	10 (23.8)	7 (20.6)	3 (37.5)
Total	42	34	8
	2 (2)		• • • •
Average	3.69	3.65	3.88
(SD)	(0.92)	(0.88)	(1.13)

Table 5.59. Ratings of how prepared youth hunters felt for their overall hunting experiences (n=42).

Table 5.60. Youth responses of the one most important reason for felt preparedness of the overall hunting experience (n=42).

What is the one most important reason for how prepared you felt about the overall hunting			
experience?	Total # (%)	Males # (%)	Females # (%)
"Prepared a lot"	13 (31.0)	11 (32.4)	2 (25.0)
"Not prepared enough"	3 (7.0)	3 (8.9)	0 (0.0)
"Family helped in preparation"	2 (4.8)	1 (2.9)	1 (12.5)
"Had fun preparing"	1 (2.4)	1 (2.9)	0 (0.0)
No comment provided	23 (54.8)	18 (52.9)	5 (62.5)
Total	42	34	8

Rating how			
you during the hunt	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	0 (0.0)	0 (0.0)	0 (0.0)
2	2 (4.8)	2 (5.9)	0 (0.0)
3	8 (19.0)	5 (14.7)	3 (37.5)
4	21 (50.0)	19 (55.9)	2 (25.0)
5 – Really Enjoy	11 (26.2)	8 (23.5)	3 (37.5)
Total	42	34	8
Average (SD)	3.98 (0.81)	3.97 (0.80)	4.00 (0.93)

Table 5.61. Ratings of how comfortable youth hunters felt during their overall hunting experiences (n=42).

Table 5.62. Youth responses of the one most important reason for comfort felt during the overall hunting experience (n=42).

What is the one most			
what is the one most			
important reason for			
how comfortable you			
felt about the overall			
hunting experience?	Total # (%)	Males # (%)	Females # (%)
"Good/eniovment/fun"	16 (38.1)	13 (38.2)	3 (37.5)
2			
"Not comfortable"	5 (11 9)	4 (11.8)	1 (12.5)
	5 (11.5)	1 (11.0)	1 (12.0)
No comment provided	21(50.0)	17(500)	(50.0)
No comment provided	21 (50.0)	17 (50.0)	4 (30.0)
Total	12	24	0
10101	42	34	0

Rating the amount			
of deer seen during the hunt	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	9 (21.4)	6 (17.6)	3 (37.5)
2	6 (14.3)	6 (17.6)	0 (0.0)
3	10 (23.8)	8 (23.5)	2 (25.0)
4	8 (19.1)	5 (14.7)	3 (37.5)
5 – Really Enjoy	9 (21.4)	9 (26.6)	0 (0.0)
Total	42	34	8
Average (SD)	3.05 (1.45)	3.15 (1.46)	2.63 (1.41)

Table 5.63. Ratings of the amount of deer youth hunters saw during their hunting experiences (n=42).

\_

Table 5.64. Youth responses of the one most important reason for your rating of the number of deer seen during the overall hunting experience (n=42).

What is the one most important reason for the number of deer seen during the overall hunting experience?	Total # (%)	Males # (%)	Females # (%)
"Saw lots/Saw many deer"	9 (21.4)	9 (26.5)	0 (0.0)
"Saw a few deer"	6 (14.3)	6 (17.6)	0 (0.0)
"Saw no deer"	4 (9.5)	3 (8.8)	1 (12.5)
"Wish I had seen more deer"	3 (7.2)	2 (5.9)	1 (12.5)
No comment provided	20 (47.6)	14 (41.2)	6 (75.0)
Total	42	34	8

Rating the time you			
hunting partner	Total # (%)	Males # (%)	Females # (%)
1 – Don't Enjoy	1 (2.4)	1 (2.9)	0 (0.0)
2	1 (2.4)	1 (2.9)	0 (0.0)
3	4 (9.5)	3 (8.8)	1 (12.5)
4	13 (31.0)	9 (26.6)	4 (50.0)
5 – Really Enjoy	23 (54.7)	20 (58.8)	3 (37.5)
Total	42	34	8
Average (SD)	4.33 (0.93)	4.35 (0.98)	4.25 (0.71)

Table 5.65. Ratings of youth time spent with their hunting partner (n=42).

Table 5.66. Youth responses of the one most important reason for your rating of time spent with your hunting partner during the overall hunting experience (n=42).

What is the one most important reason the experience with your hunting partner during the overall hunting experience?	Total # (%)	Males # (%)	Females # (%)
"Felt good about spending time with my partner"	13 (31.0)	11 (32.4)	2 (25.0)
"Good/Fun/OK"	9 (21.4)	7 (20.6)	2 (25.0)
"Got to talk"	3 (7.1)	3 (8.8)	0 (0.0)
No comment provided	17 (40.5)	13 (38.2)	4 (50.0)
Total	42	34	8

### **Intention to Continue Hunting**

Youth intention to continue hunting in the future was measured based on a series of questions in the Hunting Experience and Satisfaction survey that respondents filled out at the conclusion of the Michigan Special Youth Firearm White-tailed Deer hunt (Appendix I). One of the 43 respondents did not answer the questions about intention to continue hunting in the future.

Of the 42 youth respondents, 23 (54.8%) indicated that they would go archery hunting during Michigan's archery deer hunting season (October 1, 2012). Additionally, 4 of 42 (9.5%) youth hunters indicated that they might go hunting during archery season (Table 5.67)

Will you go archery hunting in 2012?			
	Total # (%)	Males # (%)	Females # (%)
Yes	23 (54.8)	21 (61.8)	2 (25.0)
No	15 (35.7)	11 (32.4)	4 (50.0)
Maybe	4 (9.5)	2 (5.8)	2 (25.0)
Total	42	34	8

Table 5.67. Youth intention to go archery hunting in 2012 (n=42).

Twenty-nine of 42 (69.1%) youth respondents indicated their intention to go out hunting the opening day of Michigan's firearm deer season (November 15, 2012) with an additional 12 (28.6%) youth hunters who indicated that they may go hunting the opening day of firearm deer season (Table 5.68). When youth respondents were asked what was the one most important reason for going out November 15, 2012, youth cited: "I like/love hunting," "having fun being in the outdoors," and "want to get a deer." The only "no" response to the previous question cited that they could not miss school to go hunting.

Of the 42 the respondents, 33 (78.6%) indicated that if Michigan's firearm deer season opened on a Saturday they would intend on hunting that day (Table 5.69). Interestingly, only 1 of 42 (2.4%) youth respondents said that they would not go hunting if the Michigan firearm deer season were to always open on a Saturday (Table 5.69). The data from this question suggest that there may be a potential opportunity to increase youth hunter participation during Michigan's firearm deer season by having the opening day for the season on a Saturday (e.g., Saturday closest to November 15) annually.

Will you go firearm hunting on November 15, 2012?	Total # (%)	Males # (%)	Females # (%)
Yes	29 (69.1)	25 (73.5)	4 (50.0)
No	1 (2.3)	0 (0.0)	1 (12.5)
Maybe	12 (28.6)	9 (26.5)	3 (37.5)
Total	42	34	8

Table 5.68. Youth intention to go firearm hunting on November 15, 2012 (n=42).

If the firearm season were to open on a Saturday,	T ( 1 // (0/)		
would you go?	1 otal # (%)	Males # (%)	Females # (%)
Yes	33 (78.6)	30 (88.2)	3 (37.5)
No	1 (2.4)	1 (3.0)	0 (0.0)
Maybe	8 (19.0)	3 (8.8)	5 (62.5)
Total	42	34	8

Table 5.69. Youth intention to go firearm hunting on opening day, if opening day were always a Saturday (n=42).

Of the 42 youth respondents, 27 (64.3%) indicated that they would go hunting for other game in 2012 (Table 5.70). Additionally, 4 of 42 (9.5%) youth hunters indicated that they might go hunting for other game in 2012 (Table 5.70). Of the youth respondents that indicated they intended to go hunting for other game, participants cited squirrels (52.3%), rabbits (40.5%), turkeys (31.0%), geese (28.6), and ducks and grouse (21.4%) as their choices of game to hunt (Table 5.71).

Will you go hunting for other game?			
Tor other guille.	Total # (%)	Males # (%)	Females # (%)
Yes	27 (64.3)	25 (71.4)	2 (25.0)
No	11 (26.2)	6 (17.6)	5 (62.5)
Maybe	4 (9.5)	3 (11.0)	1 (12.5)
Total	42	34	8

Table 5.70. Youth intention to go hunting for other game (n=42).

Other game y	outh have	<b>T</b> 1 //	<b>0</b> (		0 (	<b>T</b> 1 //	<b>2</b> /
or intend to h	unt	Total #	%	Male #	%	Female #	%
Rabbit	Yes	17	40.5	16	47.1	1	12.5
	No	25	59.5	18	52.9	7	87.5
Squirrel	Yes	22	52.3	20	58.8	2	25.0
	No	20	47.7	14	41.2	6	75.0
Grouse	Yes	9	21.4	9	26.5	0	0.0
	No	33	78.6	25	73.5	8	100.0
Pheasant	Yes	5	11.9	4	11.8	1	12.5
	No	37	88.1	30	88.2	7	87.5
Woodcock	Yes	1	2.4	1	2.9	0	0.0
	No	41	97.6	33	97.1	8	100.0
Ducks	Yes	9	21.4	9	26.5	0	0.0
	No	33	78.6	25	73.5	8	100.0
Geese	Yes	12	28.6	12	35.3	0	0.0
	No	30	71.4	22	64.7	8	100.0
Turkeys	Yes	13	31.0	12	35.3	1	12.5
	No	29	69.0	22	64.7	7	87.5
Bear	Yes	0	0.0	0	0.0	0	0.0
	No	42	100.0	33	100.0	8	100.0
Coyote	Yes	3	7.1	2	5.9	1	12.5
	No	39	92.9	32	94.1	7	87.5

Table 5.71. Other game youth have hunted or intend to hunt (n=42).

Only 4 of 42 (9.5%) of youth respondents indicated that they would be going out trapping in 2012 (Table 5.72). Interestingly, 2 of 4 (50%) youth who indicated that they would go trapping in 2012 were females (Table 5.72).

Will you go trapping in 2012?			
	Total # (%)	Males # (%)	Females # (%)
Yes	4 (9.5)	2 (5.9)	2 (25.0)
No	34 (81.0)	28 (82.4)	6 (75.0)
Maybe	4 (9.5)	4 (11.7)	0 (0.0)
Total	42	34	8

Table 5.72. Youth intention to go trapping in 2012 (n=42).

The final question of the overall hunting experience instrument indicated that 41 of 42 (97.6%) youth respondents planned to hunt in future years (Table 5.73). No respondents indicated that they would not hunt in the future (Table 5.73). The remaining respondent (2.4%) indicated that they "may" continue to hunt in the future (Table 5.73). When respondents were asked the one most important reason for their hunting plans in the future, 16 of 36 (44.5%) said, "Fun/enjoyed hunting," 14 of 36 (38.9%) youth said, "I like/love hunting," 3 of 36 (8.3%) said, "because all of my family does it/family tradition," (Table 5.74). Interestingly, 7 of 8 (87.5%) female respondents indicated that they intend to continue hunting in future years because they "liked/loved hunting" (Table 5.74). The remaining youth respondents that provided "other" answers included: "Free food on the Table, times are hard," To try to shoot a big buck," and "Don't know" (Table 5.74).

Do you plan to hunt in future years?			
	Total # (%)	Males # (%)	Females # (%)
Yes	41 (97.6)	33 (97.1)	8 (100.0)
No	0 (0.0)	0 (0.0)	0 (0.0)
Maybe	1 (2.4)	1 (2.9)	0 (0.0)
Total	42	34	8

Table 5.73. Youth intention to continue hunting in future years (n=42).

Table 5.74. Youth responses of intention to continue hunting (n=36).

What is the one most important reason why you intend to hunt in future years?	Total # (%)	Males # (%)	Females # (%)
"I like/love hunting"	14 (38.9)	11 (39.3)	3 (37.5)
"Fun/enjoy hunting"	16 (44.5)	12 (42.9)	4 (50.0)
"Because my family does it/family tradition"	3 (8.3)	2 (7.1)	1 (12.5)
Other	3 (8.3)	3 (10.7)	0 (0.0)
Total	36	28	8

#### **Defining Flow, Anxiety, Apathy, and Boredom Channels**

Channels of flow, anxiety, apathy, and boredom were calculated based on the intersection of average perceived challenge (Table 5.42) and skill (Table 5.44) ratings from the sample of youth hunters that provided the Background Survey, at least one ESM Survey, and the Hunting Experience and Satisfaction Survey (n=43) (Figure 5.3). Csikszentmihalyi, Rathunde, and Whalen (1993) suggest that utilizing raw-score values for challenge and skill are an appropriate way to calculate sample averages. After each of the hunting experiences, youth respondents answered a series of questions about how they felt, perceived challenge, and mood while hunting. Respondents answered two specific questions used to determine "flow" while hunting. The first question asked youth to indicate the perceived challenge of the hunt, while the second question asked youth to indicate their perceived skill level during the hunting experience. Of the 43 respondents, the average perceived challenge was 3.30 (Table 5.42) and perceived skill was 3.67 on a Likert 5-point scale (Table 5.44). Channel scores were calculated by the quotient of perceived challenge to perceived skills for each youth hunting experience. Perceived challenge > 3.30 and skill > 3.67 were youth hunters considered to be in the "flow" channel during the hunting experience. Youth hunters with perceived challenge > 3.30 and skill < 3.67 were considered to be in the "anxiety" channel during youth the hunting experience. Youth were considered to be in the "apathy" channel during the hunting experience if they rate their challenge < 3.30 and skill < 3.67. Finally, youth were considered to be in the "boredom" channel when their perceived challenge < 3.30 and skill > 3.67 (Figure 5.3).



Youth Hunting Experience Four-Channel Flow Model

Figure 5.3. The four-channel flow model applied to youth hunters during Michigan's Special Firearm White-tailed Deer Season (September 22 and 23, 2012).

#### **Relationship Between Channels and Indicators of Flow**

Hypothesis 1 states that there is a positive relationship between respondents' perceived mood, flow indicators, level of skill, and perceived challenge using the four-channel model (Massimini & Carli, 1988). Differences in subjective experiences existed among flow, anxiety, apathy, and boredom channels for 4 of the 8 indicators, however they were not significant (Table 5.75). Youth hunters were more likely to exhibit flow (n=41) than boredom (n=21), anxiety (n=19), and apathy (n=3) channels during the Michigan Special Youth Firearm White-tailed Deer Hunt on September 22 and 23, 2012.

Consistent with H<sub>1</sub>, youth hunter flow channel experiences were significantly related to involvement and self-esteem. Inconsistent with H<sub>1</sub>, the flow channel was not considered to be an indicator during involvement of the hunt where boredom was considered the dominant factor. Additionally, inconsistent with H<sub>1</sub> was the relationship between flow and personal expectations during the hunting experience. Analysis of self-esteem from a personal perspective indicates that boredom was more indicative of a young hunter's perspective than the flow, anxiety, or apathy channels of the four-channel model (Table 5.75). Further, there is a lack of significant difference of flow indicators: intrinsic motivation, merging of action and awareness, self-esteem from a peer and family perspective, concentration on task at hand, and paradox of control. Due to small sample size, a post-hoc Bonferroni correction was calculated. A small sample size suggests that a post-hoc comparison be used to keep *p*-values at desired levels. Therefore, a test of homogeneity of variances was used to determine the need for a post-hoc comparison. The post-hoc comparison indicated that variances differ statistically at p < .05 for flow indicators of involvement, intrinsic motivation, and self-esteem from family and personal perspectives. In the case of flow indicators (Table 5.75), the Bonferroni correction was able to correct for *p*-values

Flow Indicators	Flow $(n = 41)$	Anxiety $(n = 19)$	Boredom $(n = 21)$	Apathy $(n = 3)$	Model F
Involvement	0.17a	-0.69b	0.46a	-1.25b	8.13**
Intrinsic Motivation	0.01	0.03	-0.18	0.96	1.16
Merging of Action and Awareness	-0.04	0.01	0.10	-0.24	0.15
Self-Esteem Personal Expectations	-0.08	-0.26	0.48	-0.69	2.79*
Peer Expectations	0.19	-0.04	-0.32	-0.09	1.23
Family Expectations	0.14	-0.07	-0.18	-0.18	0.53
Concentration on the Task at Hand	0.15	0.04	-0.22	-0.72	1.19
Paradox of Control	0.19	-0.14	-0.16	-0.05	1.08

Table 5.75. Relationship between channels of flow, anxiety, apathy, and boredom to flow indicators during the Michigan Special Youth Firearm White-tailed Deer Hunt (n=84 hunts).

and were found to be significant for the four channels as they related to involvement during the hunting experience.

Consistent with H<sub>1</sub>, youth hunter's flow channel experiences that were significantly related to the mood indicators were how relaxed, strong and excited one felt during the hunting experience. However, inconsistent with H<sub>1</sub>, flow was not considered to be the prominent channel during the hunts. Instead, boredom was the dominant channel among the three mood indicators. Additionally, mood indicators of being happy, active, proud, sociable and friendly were not statistically significant. The post-hoc comparison indicated that variances differed statistically at p < .05 for mood indicators of relaxed, strong, and excitement. Due to small sample size, a post-

Note. Values represent mean z scores. Row means with disparate subscripts are significantly different based on a Bonferroni correction (p < .05). \*p < .05., \*\*p < .01.

Mood Indicators	Flow $(n = 41)$	Anxiety $(n = 19)$	Boredom $(n = 21)$	Apathy $(n = 3)$	Model F
Нарру	0.17	-0.35	0.12	-0.89	2.11
Active	0.01	-0.23	0.13	0.40	0.58
Proud	0.21	-0.07	-0.32	-0.13	1.36
Relaxed	0.05	-0.60	0.42	-0.03	3.84*
Strong	0.14	-0.59	0.31	-0.23	3.40*
Sociable	-0.03	-0.05	0.12	-0.19	0.16
Excited	0.07	-0.63	0.50	-0.63	5.35**
Friendly	-0.02	-0.04	0.11	-0.73	0.63

Table 5.76. Relationship between channels of flow, anxiety, apathy, and boredom to mood indicators during the Michigan Special Youth Firearm White-tailed Deer Hunt (n=84 hunts).

Note. Values represent mean z scores. Row means with disparate subscripts are significantly different based on a Bonferroni correction (p < .05). \*p < .05., \*\*p < .01.

hoc Bonferroni correction was calculated. In the case of mood indicators (Table 5.76), however the Bonferroni correction was unable to correct for *p*-values.

Therefore, although one flow indicator (involvement) and three mood indicators (relaxed, strong, and excited) were able to successfully predict one of the flow channels (boredom), I reject  $H_1$  in favor of the null hypothesis (Ho1) that states that there is no association between youth firearm deer hunting experiences and respondents' perceived mood, flow indicators, level of skill, and perceived challenge using the four-channel model.

# **Frequency of Channels Among Hunting Experiences**

Hypothesis 2 states that there is a positive relationship between respondents' levels of "flow" and "anxiety" and experiences of hearing, seeing, shooting at, and harvesting white-tailed

deer during the Michigan Special Youth Firearm White-tailed Deer Hunt (Table 5.77). In support of H<sub>2</sub>, the Chi-Square Test of Association revealed that flow and anxiety channels exhibited a significant and positive relationship related to hearing deer and other animals, and seeing whitetailed deer. Consistent with H<sub>2</sub>, flow and anxiety measurement stages were the major channels for youth describing their experience of seeing white-tailed deer (Table 5.77). Three of eight measurement stages of the hunt were significant to providing either flow or anxiety experiences of young hunters. Due to a limited number of deer harvested (legal bucks and does) and few or no values in any of the four flow channels, a chi-square test of association for shooting at deer, harvesting bucks, and other antlerless white-tailed deer was not possible. I can conclude that there is enough statistical evidence to support H<sub>2</sub>. Consequently, I reject the null hypothesis 2 (Ho2) that states that there is no association between youth firearm deer hunter experiences of hearing deer and other animals, and seeing white-tailed deer relative to the flow and anxiety constructs of the four-channel model (Massimini & Carli, 1988).

Table 5.77. Chi-Square Test of Association for differences in frequency of channels during Michigan's youth firearm white-tailed deer hunting experience and hearing deer and other animals, and seeing and shooting at deer (n=84 hunts).

Measurement Stage	Flow (n=41)	Anxiety (n=19)	Boredom (n=21)	Apathy (n=3)	$\chi^2$
Hearing Deer and Other Animals	25 (42.4%)	12 (20.3%)	21 (35.6%)	1 (1.7%)	10.22*
Seeing White-tailed Deer	36 (55.3%)	16 (24.6%)	10 (15.4%)	3 (4.7%)	14.56*
Shooting at White-tailed Deer	21 (72.4%)	2 (6.9%)	6 (20.7%)	0 (0.0%)	12.52*
Total Frequency	41	19	21	3	

Note. The Chi-Square Tests of Association is reported measurement stage of the hunt and the four channel model.

\*p < .05.

# Intention to Continue Hunting and its Relationship to Flow

Hypothesis (H3) states that a positive relationship exists between participants' ability to achieve various levels of "flow" under hunting conditions and intention to continue hunting. A discriminant analysis was used to examine which components were the best indicators of "flow" and nonflow experiences (Table 5.78). A pooled-within-group correlation between discriminating variables and canonical discriminant functions was used to display results. Consistent with H<sub>3</sub>, there was one component of the discriminant analysis that could be correlated with youth hunters that had flow experiences. Correlation within the flow channel was significant for amount of white-tailed deer seen during the youth deer hunting experience. These data, then, are consistent with the previous hypothesis (H<sub>2</sub>) of seeing white-tailed deer. Additionally, on a Likert scale (1 – Very Bad to 5 – Very Good), youth hunters rated seeing deer during their hunting experiences at 3.54 (S.D. - 1.45) (Table 5.79). Inconsistent with H<sub>3</sub>, the discriminant analysis revealed there was no discriminating ability between participants who had various levels of "flow" and their intention to continue hunting (Table 5.79). Therefore, I fail to reject the null hypothesis 3 (Ho3) that states that there is no association between participants that have various levels of "flow" and their intention to continue hunting. Additionally, the high percentages of respondents that indicated intention to continue hunting in the circumstances measured, made it difficult to apply hypothesis testing and a discriminant analysis statistical procedure.

Youth Hunters'	Unstandardized Canonical Function Coefficients	Standardized Canonical Function Coefficients	Discriminant Loading Absolute (Rank)	F Ratio
Rating of the hunt	0 449	0 424	-0.069(10)	0 154
Propagation for the hunt	0.212	0.210	0.140 (9)	0.151
Preparation for the num	-0.515	-0.319	0.140 (8)	0.040
Comfort level on the hunt	0.547	0.461	0.270 (6)	2.395
Amount of deer seen	-0.552	-0.843	-0.525 (1)	9.046**
Time spent with partner	0.467	0.457	0.279 (4)	2.546
Intend to archery hunt	0.444	0.277	0.276 (5)	2.500
Intend to firearm hunt	0.065	0.059	-0.046 (11)	0.070
Would hunt if a Saturday firearm opener	0.491	0.377	0.279 (3)	2.554
Intent to hunt for other game	0.722	0.473	0.296 (2)	2.869
Intend to go trapping	-0.290	-0.123	-0.138 (9)	0.623
Intend to hunt in future	-1.094	-0.239	-0.179 (7)	1.049
Group centroid low	-0.640			
Group centroid high	0.610			
Wilks' Lambda	0.715**			
Canonical Correlation	0.534			

Table 5.78. Summary of experience measures of youth hunters with discriminant analysis (n=84 hunts).

\*p < .05., \*\*p < .01.

Variable (Youth Hunters)	Mean	Standard Deviation	F Value
Rating of the hunt	4.17	0.85	0.154
Preparation for the hunt	3.69	0.93	0.646
Comfort level on the hunt	3.98	0.81	2.395
Amount of deer seen	3.05	1.45	9.046**
Time spent with partner	4.33	0.93	2.546

Table 5.79. Comparison of experience measures during youth participating in the Michigan Special Youth Firearm White-tailed Deer Hunt (n=84 hunts).

\**p* < .05., \*\**p* < .01.

#### **CHAPTER 6**

## SUMMARY AND CONCLUSIONS

The purpose of this exploratory study was to determine if participation in recreational hunting activities (i.e. the Michigan Special Youth White-tailed Deer Hunt) resulted in "flow" experiences and if those experiences were related to behavioral intentions to continue hunting in the future. I utilized the framework of flow theory (Csikszentmihalyi, 1975) and the four-channel model of "flow" (Massimini & Carli, 1988) during a hunting activity (Michigan's Special Youth Firearm White-tailed Deer Hunt, September 22 and 23, 2012). Additionally, flow theory was used to determine if: involvement; intrinsic motivation; merging of action and awareness; family-, peer-, and self-esteem expectations; concentration of task at hand; and paradox of control were potential predictors of "flow" during a special youth white-tailed deer hunt. A purposeful sample of youth deer hunters (ages 12 to 16) were examined utilizing: (1) a Background Survey administered at the youth's respective Michigan Hunter Education course, (2) the Experience Sampling Method (ESM) Hunting Survey during the hunt, and (3) the Hunting Experience and Satisfaction Survey as a post-hunt instrument. Hypothesis testing was used to determine if: youth hunters had varying levels of "flow" experiences during the hunt; were more apt to experience "flow" when hearing, seeing, shooting at, or harvesting a deer; and were more likely to participate, have positive experiences, and continue hunting in the future due to these "flow" experiences.

This chapter is organized in the following sections: (1) Summary of Sampling Methods (2) Summary of Procedures; (3) Summary of Findings; (4) Conclusions; (5) Discussion and Implications; and (6) Recommendations for future research.

#### **Summary of Sampling Methods**

The sample was selected from nine Michigan Hunter Education classes from August 11, 2012 to September 16, 2012. Due to instrument questions being related to personal beliefs and feelings regarding a youth's hunting experience, I felt it best to attend each of the Hunter Education courses and meet with parents/guardians, youth, and respective Hunter Education instructors. The goal of attending each of the courses was to develop a shared trust among instructors, parents/guardians, and youth in an effort to ensure higher survey response and more authentic answers to questions from youth. Unfortunately, one of the drawbacks to this methodological approach is the small sample size that was ultimately achieved. An additional limitation of this methodology included the number of hours expended on the miles traveled to Hunter Education classes (1742 miles) to acquire the sample of youth data analyzed. Although time and resource intensive, the personal relationships developed with Hunter Education instructors, parents/guardians, and youth far outweighed the monetary costs of capital (human and physical) invested in the study. Another limitation to this study was the bias toward south and central Michigan Hunter Education classes. To minimize non-response, parents and guardians of participants were phoned and e-mailed the week prior (September 17, 2012) to the Michigan Special Youth Firearm White-tailed Deer Hunt (September 22 and September 23, 2012) to remind respondents that they had indicated an interest in participating in the study. Additionally, parents and guardians of non-respondent participants were phoned and e-mailed on September 24, September 28, and October 15, 2012 to remind youth to please fill out and return the surveys to the researcher. I believe my involvement in Hunter Education classes contributed to the response rates of young participants in this exploratory study.

#### **Summary of Procedures**

Sample subjects were volunteers from Hunter Education courses around the State of Michigan. Of the 182 invited to participate, 98 (53.8%) youth ages 12 to 16 years of age assented (with parental consent) to be a part of the study by participating in the Background Survey at their respective Hunter Education classes. Of the sample of 98 respondents, 51 (52.0%) youth participated in the second and third set of questionnaires in the study by hunting and filling out at least one ESM Hunting Survey during Michigan's Special Youth Firearm White-tailed Deer Hunt (September 22 and 23, 2012), and the Hunting Experience and Satisfaction Survey at the original 51 respondents to the Background Survey, at least one ESM Hunting Survey, and Hunting Experience and Satisfaction Survey, and Hunting Experience and Satisfaction Survey and Hunting Experience and Satisfaction Survey and Hunting Experience and Satisfaction Survey were determined to be complete and provide valid and reliable data for analysis and hypothesis testing.

The Michigan Special Youth White-tailed Deer Hunt survey instruments were developed and tested for reliability and validity prior to the study. Professionals within the Hunter Education community were asked to review the instruments. Additionally, ten youth subjects ages 12 to 16 were administered the Michigan Special Youth White-tailed Deer Hunt survey instruments prior to the beginning of the study. Youth subjects' scores were tested using a Cronbach's Alpha statistical procedure and were determined to be reliable for future use in the Michigan Special Youth Firearm White-tailed Deer Hunt study.

Youth subjects participated in the study while at their Michigan Hunter Education course and during the Michigan Special Youth Firearm White-tailed Deer Hunt, September 22 and 23, 2012. Youth respondents that assented to participate in the study were administered the Background Survey at their respective Michigan Hunter Education course, then participated in

the study based on the frequency that each respondent went hunting during the Michigan Special Youth Firearm White-tailed Deer Hunt. The Experience Sampling Method (ESM) was used to obtain an immediate subject response to a youth's hunting experiences. Each youth respondent filled out the ESM Hunting Experience Survey following the hunt by completing the appropriate survey based on the day and time. This approach was chosen to minimize safety concerns and to ensure minimal distractions during the hunt. Upon completion of the Michigan Special Youth Firearm White-tailed Hunt, youth respondents mailed results to the researcher. A limitation to this application of the ESM methodology may include the timing in which respondents filled out the survey, however this was not measured. Research by Hektner et al. (2007) suggest that ESM surveys should be filled out during or very soon after the experience, however not compromising safety and the experience of the hunt with young hunters was believed to be more important.

Descriptive statistics and hypothesis testing of data were conducted using IBM SPSS v. 19.0. Small sample size was an important consideration and limitation of parametric statistical techniques in this study. Although sample sizes were small in this exploratory study, prior research suggests that ESM studies can be conducted with a small number of respondents (Hektner et al., 2007). Hektner et al. (2007) suggests that ANOVA, Chi-Square, and other similar statistical techniques are appropriate for analysis of ESM data. Sample sizes less than 50 have been used successfully in several outdoor recreation studies (Hektner et al., 2007; Jones et al., 2000; McIntyre and Roggenbuck, 1998).

### **Summary of Findings**

This exploratory study of "flow" and the potential for hunter recruitment in youth Michigan firearm deer hunters addressed three objectives including: (1) determining levels of "flow" by youth hunters during a Michigan white-tailed deer hunting experience; (2) determining if "flow" could be a predictor of hearing, seeing, shooting at, or harvesting deer; and (3) determining if "flow" and non-flow experiences can classify participation in the hunt, experience in the hunt, and intention to continue hunting in the future.

Each of the 22 ESM Hunting Experience scale items was scored across five point Likertscales. Frequency and level of "flow" occurrences were obtained from participants' response to the ESM Hunting Survey instrument. Challenge and skill scale scores were used to determine when and to what extent "flow" occurred. "Flow" scores were computed by taking the youth respondents' perceived challenge score and dividing it by the respondents' perceived skill score. Z-scores were then calculated from the "flow" score calculations, and flow constructs to control for individual response bias. Of the 43 respondents that participated in 84 hunts during the course of the two-day Michigan Special Youth Firearm White-tailed Deer Hunt, there were 41 occurrences of "flow," 19 occurrences of "anxiety," 21 occurrences of "boredom," and 3 occurrences of "apathy." Raw "flow" scores calculated to z-scores ranged from -6.38 to 4.73, where negative z-scores are below the group mean and positive scores are above the group mean.

A comparison between the original 98 Background Surveys (Tables 5.1 to 5.14) that were returned (non-respondents) and the 43 Background Surveys (Tables 5.15 to 5.28) within the completed results yielded few differences between responses to questions among the respondents and non-respondents of the complete surveys. Of the eight unusable packets of questionnaires that were returned by respondents, four of the respondents cited that they were not able to hunt because they: "went squirrel hunting instead," "had no time with DAD," "had a broken ankle," or "were sick."

Of the 43 youth that participated in this exploratory study, 88.4% of respondents indicated that they had hunted prior to taking their Hunter Education course (81.4% male and

18.6% female), with an average age of 12.81 (SD – 1.07). Additionally, youth were more likely to hunt with their dad when they could both shoot (78.9%) and not shoot (97.4%), than any other adult measured in this study. Of the youth sampled (n=43), 54.8% indicated that their best friend also hunts while 79.1% of youth indicated that they had watched a TV, DVD, or video about deer hunting or gamed about deer hunting in the past year. These results imply that youth relate to multimedia through videos and gaming more so than their best friend in the context of this sample.

Of the recreational activities measured in the Background Survey, males most often indicated that they "Really Enjoyed" hunting (73.5%), whereas females most often indicated camping (88.9%) as their choice of recreational enjoyment. Additionally, on average, both males (4.65, SD - 0.65) and females (4.67, SD - 0.71) rated hunting as the most favorable activity as compared to other recreational activities measured in this exploratory study. These results suggest that both males and females were focused on the youth hunting experience and that they had achieved their end goal after they had taken their Hunter Education course.

Youth females rated their previous activity experiences higher than their male counterparts on all constructs measured except gaming and being in the outdoors. This suggests that females in this sample are more likely to enjoy "doing" while taking part in outdoor recreational experiences than males in this study. Additionally, females were more likely to enjoy camping (4.78, SD – 0.67) followed by shooting sports (4.67, SD – 0.50) and hunting (4.67, SD – 0.71). These results are consistent with research that suggest that females are more likely to enjoy camping, wall climbing, and other outdoor activities that promote "doing" while in the outdoors (Kamal, Khadir, & Yunus, 2010). For example, providing young females with hunting experiences that engage in "doing" activities may be appropriate. Furthermore, these

results suggest that gaming is important to young males, however, on average, gaming was rated the lowest of any activities in the Background Survey for both males and females.

During the youth hunting experience on Saturday and Sunday (September 22 and 23, 2012), youth hunters hunted Saturday PM more often than any other hunting time, where males saw an average of 4.78 deer and females saw an average of 1.67 deer. Although the Sunday PM hunting time was the least prescribed to by females, on average they saw more deer (3.00) than any other hunt period Based on the data and comments made by youth participants, the Saturday PM hunt was most hunted due to weather conditions and number of deer seen. The Saturday AM hunting period and Sunday AM and PM hunts were less favorable to hunters due to cited factors such as church, other family commitments, and weather.

Male youth hunters were more likely to hunt on their own property, while females indicated that they most often hunted on a relative's property. While hunting, youth were most likely to be thinking about hunting. Interestingly, a significant portion of female (27.8%) respondents in the study thought about nature most often during their hunting experiences. This result may imply that females are more intrinsically motivated when participating in the hunting experience.

Of both the four hunting periods (Saturday AM, Saturday PM, Sunday AM, and Sunday PM), youth shot at 29 white-tailed deer (25 male hunters, 4 female hunters), harvesting 16 deer (15 male hunters, 1 female hunter) with 12 legal bucks (11 male hunters, 1 female hunter) being harvested, 3 bucks with antlers smaller than 3" (3 male hunters), and one doe (1 male hunter). These data suggests that although management of antlerless deer is an important consideration and component of wildlife management, the Michigan Special Youth Firearm White-tailed Deer

Hunt may serve as a cultural event to get youth out and have an opportunity to harvest their first "buck."

In general males and females that harvested deer "Enjoyed" or "Really Enjoyed" the experiences of finding and field dressing the animal after the harvest. This suggests that it is not just about shooting a deer, but the activities that occur after the hunt and harvest, which supports the work of Langenau and Mellon (1980).

Experience Sampling Method questions provided ratings from youth on their perceived "flow" experiences related to feelings, interest, and mood levels during the four youth hunt periods. Females rated "importance of the hunt," "wish they had been doing something else," "the hunt as an interesting experience," "alignment with goals for the future," "enjoyment of the hunt," "feeling as though they were doing the best they could do," "feeling in control of the hunt," and "feeling better about themselves during the hunt" higher than their male counterparts. Males rated the "challenge of the hunt," and that they would "talk to a friend or family member about their hunting experience" higher than females. Ratings were the same for perceived "skill of the hunt" and "belief that they were getting better at hunting."

In this exploratory research without significance testing, mood ratings measured during each of the hunt periods indicated that males rated their "happiness" and "strength" higher than females. Whereas, females rated their perceived levels of "activeness," "pride," "relaxation," "sociability," "excitement," and "friendliness" higher than their male counterparts. Overall, total perceived "happiness" (4.30, SD – 0.70) and "excitement" (4.18, SD – 0.89) ratings were highest among all mood indicators measured suggesting that youth respondents that participated in this study were enjoying the hunting experiences and indicated this through their rating of the various hunt periods. Additionally, these ratings were also reflective of scores from previous questions

about perceived enjoyment of their specific hunting experiences during Michigan's Special Youth White-tailed Deer Hunt.

Youth ratings of their overall hunting experience and satisfaction were measured using the Hunting Experience and Satisfaction Survey. The results suggest that youth rated their overall experience of the youth hunt high (4.17, SD – 0.85) on a scale of 1 to 5. Males (4.32, SD – 0.81) rated their overall experience of the hunt higher than females (3.50, SD – 0.76). These ratings by males and females are inversely proportional to the ratings of the hunting experience in the ESM Hunting Survey, suggesting that further methodological research needs to occur to determine the reliability of these instruments in other recreational hunting venues (e.g., Michigan's Special Youth Waterfowl Hunt). Of the 16 white-tailed deer harvested by 43 youth hunting participants, 15 deer were harvested by 35 male respondents (34.3%), whereas, females only harvested one deer (12.5%) out of 8 respondents. Given that males were more successful, these results may suggest that extrinsic factors of success on the hunt are important. However, the small sample size is a limitation of this research.

Females rated questions about the "overall hunting experience," "preparation," and "comfort level" during the hunt higher than males. However, males rated the "number of deer seen" and "time spent with their hunting partner" as more important than females. These results may suggest that females enjoyed the hunting experience based on factors associated to the intrinsic motivation of the hunt, whereas males were more focused on the extrinsic factors related to number of deer seen, and opportunity to dialogue with their hunting partner.

Youth participants in this study were asked questions related to their intention to continue hunting in the future. Of the youth that responded to this question, 54.8% intended to go hunting during Michigan's archery season. Interestingly, males (63.6%) intended to hunt during the

archery season more than females (25.0%). Of the 42 respondents, youth indicated an intention to go hunting the opening day of firearm deer season (69.1%), with a high percentage of non-"yes" responses indicating "maybe" (28.6%). Further, youth respondents also indicated an intention to go hunting on the opening day of firearm deer season if it opened on a Saturday closest to November 15 (78.6%), with 19.0% of youth indicating that they "may" go hunting on this same day. Of the youth respondents that answered questions about their overall intention to continue hunting for other game, males (71.4%) indicated a stronger intention to hunt for other wild game versus females (25.0%). This suggests that males may be more likely to hunt other forms of wild game, whereas females are more centric to hunting white-tailed deer. This may also imply that females may be an excellent target audience for recruitment of future hunters with a focus on deer hunting. Finally, opportunities to recruit male youth populations to hunting may be more appropriate in areas other than deer hunting such as waterfowl, turkey, bear, or other small game hunting opportunities.

Finally, of the 43 youth participants in this study, 41 (97.6%) of 42 indicated that they intended to hunt in the future. Of those respondents, 100% of females indicated that they intended to hunt in the future. The only other response indicated "maybe" due to school responsibilities that may influence other youth participants from hunting in the future. This study suggests that Michigan's Special Youth Firearm Deer Hunt was a positive overall experience that may provide youth with the support needed to hunt in the future. Due to the small sample size, generalizations of statements across the larger population of youth hunters that participate in Michigan's Special Youth Firearm Deer Hunt is not possible, however it does provide the impetus for future research to reinforce and support this exploratory study and methodological approach. Future research may be possible through utilization of Michigan Department of
Natural Resources Apprentice and/or Junior Hunting License data as a sample to apply this study methodology.

Hypothesis 1 was not supported by the findings that the four-channel model significantly predicted 2 of 8 flow indicators and 3 of 9 mood indicators. However the similarity in means between the flow and boredom channels in the involvement indicator, suggest that even if the challenge of the hunt exceeded the skill of the young hunter, the quality of the experience in the boredom state was no different than the flow state. This similarity in means also indicates that youth hunters of this purposeful sample are experiencing sensations of flow and boredom common in typical white-tailed deer hunting scenarios where "blind" or stand hunting in Michigan is a standard hunting technique. Additionally, the quality of the experience in the boredom state was very similar to the flow state. These results suggest that unless young hunters are constantly hearing and seeing white-tailed deer and other animals while hunting, the boredom channel may be a prominent feature that characterizes a youth's deer hunting experiences. Consequently, youth may lose interest in white-tailed deer hunting if not provided with flow-like hunting experiences (e.g., hearing deer and other animals, and seeing deer) on a regular basis. This factor may be related to the autotelic personality of youth and their desire to repeat enjoyable experiences such as certain types of hunting where the frequency of seeing game is high (e.g., waterfowl) or is combined with seeing more game and physically pursuing the game (e.g., grouse, woodcock, pheasants, rabbits). Additionally, the notion of the linkage between the flow model and involvement through repeated enjoyable experience is directly related to a youth's relationship between the flow and boredom channels and inversely related to the anxiety and apathy channels during youth leisure activities that are framed by flow experiences (Bassi and Delle Fave, 2004).

Hypothesis 2 was partially supported by the findings that the "flow" channel experiences using the four-channel model could significantly predict the ability to hear deer and other animals, and see white-tailed deer. The working hypothesis stated that there is a positive relationship between respondents' levels of "flow" and "anxiety" and experiences of hearing, seeing, shooting at, and harvesting white-tailed deer during the Michigan Special Youth Firearm White-tailed Deer Hunt. Two of eight measurement stages of the hunt supported the hypothesis that either flow or anxiety experiences could be attributed to whether a young person is hearing deer or other animals, and seeing deer. These results are consistent with research conducted by Jones et al. (2000) suggesting that experiences characterized by flow and anxiety are much more prominent in situations where perceived challenge and skill of the participant is heightened, and boredom is more apparent where perceived challenge and skill by the participant is low. These results are also consistent with Csikszentmihalyi's (1975, 1990) research suggesting that there is a strong linkage between autotelic dimensions of "flow" and experiences where adventure is occurring through "hearing," "seeing," and "doing." The results of this hypothesis also support the work of Langenau and Mellon (1980) that indicate that young hunters are more likely to enjoy hunting experiences if they are actively seeing deer. The results of H<sub>2</sub> also support the use of flow theory and the methodological approaches to special youth hunting experiences. These results also provide an important framework for additional research where youth could be measured in specific hunting experiences. These results also support the work of Decker & Purdy (1986) that suggest another theoretical approach that supports a way to initiate new hunters into a hunting experience by utilizing flow theory methodology as a way of measuring intention and participation. Flow theory has the potential to provide a measure intention by understanding enjoyment levels of young hunters. Understanding aspects of enjoyment from a

young person's perspective may help parents, guardians, and mentors provide positive hunting experiences.

Hypothesis 3 was not supported by the findings that "flow" channel experiences using the four-channel model could significantly predict a youth's intention to continue hunting in the future. The results suggest that youth could not be classified within groups to predict "flow" experiences based on the experience and intention to continue hunting in the future. In the case of the 2012 Michigan Special Youth White-tailed Deer Hunt experience, utilizing the constructs of overall experience and intention to continue hunting have little promise in predicting "flow." Only one of the dependent variables (amount of deer seen during the youth hunting experience) was significant (p < .05). A pooled-within-group correlation between discriminating variables and canonical discriminant functions was used to display results. The component of "amount of deer seen" and their respective correlations were: -.843, (.534) with the respondents' average Likert scale score (1 –Very Bad to 5 – Very Good) of 3.54 (SD – 1.45). Although this is important, and supports the work of Langenau and Mellon (1980), it does not support the remaining dependent variables considered by H<sub>3</sub>. Further, the results of the discriminant analysis suggest that there is no capacity to predict membership groups based on hunter satisfaction or the hunting experience and intention to continue hunting in the future. These results suggest that overall youth experience and satisfaction of a recreational activity are not conducive to successful measurement of "flow" constructs as respondents are measuring experiences after the experience has occurred. This further supports research conducted by Csikszentmihalyi (1975, 1990), Jones et al. (2000), and McIntyre and Roggenbuck (1998) that "flow" should be measured during or very soon after the experience.

Finally, hearing and seeing deer is important! This research supports hypothesis 2 and the work of hunter satisfaction research conducted by Langenau and Mellon (1980). In that research, seeing deer was a critical component of overall satisfaction with the hunting experience. Based on the findings and within the limitations of this exploratory Michigan Special Youth White-tailed Deer Hunt study, the ability of hunting participation, experience on the hunt, and intention to discriminate between "flow" and non-flow experiences was best indicated by a young person's success in seeing deer while on the hunt.

#### Conclusions

Descriptive statistical procedures suggest that there are differences in this sample based on the results of the Background Survey, ESM Hunting Surveys, and Hunting Experience and Satisfaction Surveys. In general, females were more attuned to the intrinsic motivation factors highlighted within the ESM Hunting Surveys, whereas males were more likely to rate extrinsic experiences higher while hunting. Results also suggest that females are more perceptive of particular aspects of the overall experience and satisfaction of the hunt including preparation and comfort. Additionally, these results suggest that young male hunting respondents rated seeing deer and talking with their hunting partner as more important. Further, subjects were equally likely to intend to deer hunt using archery equipment, go hunting the opening day of Michigan's Firearm Deer Season (November 15), and hunt white-tailed deer if the opening day of firearm deer season were to always open on a Saturday (closest to November 15). Finally, of the 42 respondents in this study that answered that question about intention to hunt in future years, all but one indicated that they intended to hunt in the future. Therefore, this study suggests that there is predictive value to those young people that go hunting during Michigan's Special Youth White-tailed Deer Hunt and those that are also likely to become future hunters. For example, if a

youth and his or her mentor have a "positive" experience during the Michigan Special Youth Firearm White-tailed Deer Hunt, that same youth will likely intend to continue hunting in the future. This finding provides support for Michigan's Special Youth Firearm White-tailed Deer Hunt and also supports the importance of this opportunity as an excellent way to recruit new hunters for the future.

Based on the findings of the hypothesis testing in this research and within the limitations of this exploratory study, "flow" experiences were not a viable predictor of intention to continue hunting for youth during Michigan's Special White-tailed Deer Youth Hunt. The implication of flow theory to this hypothesis is important and supports the work of Csikszentmihalyi (1975, 1990), Jones et al. (2000), and McIntyre and Roggenbuck (1998) by stating that ESM measurements should occur during the experiences being measured and not post-hoc. However, the four-channel model (Massimini & Carli, 1988) has the potential to be a viable predictor of youth hunting experiences when hearing deer and other game, and seeing white-tailed deer is a significant feature of the hunt. This implication provides an opportunity to apply the four-channel model and flow theory to other youth hunting experiences. Understanding and quantifying flow theory based on a larger sample has the ability to inform future research that may assist in understanding psychological constructs related to a youths' desire to hunt in the future.

A valid and reliable scale was developed to measure background, in-situ hunting experiences, and intention to continue hunting for youth firearm white-tailed deer hunters. Understanding youth experiences related to hunting has not been fully examined, however, within this exploratory study, the indications are that this instrument has the potential to be adapted to other youth hunting activities. However, individual ESM Hunting Survey results for

female enjoyment of the hunt and overall enjoyment of the hunt measured in the Hunting Experience and Satisfaction Survey were contradictory. Therefore, additional testing of the three instruments to other youth audiences in the context of hunting activities is merited to further validate instrumentation.

#### **Discussion and Implications**

The method used to measure "flow" seemed to be problematic in certain instances. Youth respondents who completed the ESM instruments may have only hunted one time during the Michigan Special Youth White-tailed Deer Hunt. Therefore, as few as one "flow" measurement may have occurred during the study. This occurrence may have been due to the youth participants harvesting a deer during the first morning of the hunt or ancillary activities that may have prevented the young hunter from going hunting the remainder of the Michigan Special Youth White-tailed Deer Hunt. This is a limitation to the methodological approach used in this exploratory study, however a larger sample applied in another hunting context may improve this methodology in the future.

Although there was limited success in the hypothesis testing that flow theory could explain continued participation in hunting, nearly all respondents indicated that they intended to continue hunting in the future. Another major limitation of this research is the small sample size that comprised this study preventing generalizations across larger populations of youth in Michigan's Special Youth White-tailed Deer Hunt. A recommendation for larger sample size supports the work of Jones et al. (2000) and McIntyre and Roggenbuck (1998). Based on the successful aspects of this study, future application should include development of research based on a larger, more representative sample from a current Michigan youth license holder database. Implementing this study in the future has the potential to support the positive aspects of

participants that are in "flow," and are those individuals that are more likely to hear, see, and shoot at deer. Additionally, application of this methodology should also be applied to other special youth hunting experiences. Other applications of this research that should be considered include Michigan's Special Youth Waterfowl Hunt and various small game seasons (e.g., pheasant, grouse, woodcock, rabbits). Waterfowl hunting is often characterized by having many opportunities to shoot at birds. Various small game hunting experiences are often framed by situations where the hunter is walking and finding game and where dogs are often used to "flush" game.

Weather conditions during the hunting experiences may have played an important part influencing youth during this research. This confounding factor influenced the amount of data collected during the study. Youth respondent and adult mentor perceptions of the weather were important to subject response rates. Some youth respondents and adult mentors perceived the weather to be a detriment to the hunting experience, while other youth respondents and adult mentors perceived weather conditions as a benefit to the hunting experience. Weather conditions sometimes determined when youth respondents and adult mentors chose to participate in the study. If they were not hunting, they were not able to answer the ESM survey questions. Youth cited weather as being the reason they did not go out on a particular hunting experience on nine different occasions. Therefore, another limitation to a study that occurs only one weekend a year like Michigan's Special White-tailed Deer Hunt includes weather conditions that may keep young hunters out of the field.

Youth respondents were examined in an assumed freely chosen, intrinsically motivated activity. This study involved an event-contingent ESM approach where youth subjects responded to questionnaires when it was safe and appropriate to do so. However, placing these limitations

on youth respondents also provided an opportunity for recall error to occur as well as the potential to forget about the ESM Hunting Experience questionnaire all together. For example, a youth may have hunted both Saturday morning and evening, but only remembered to fill out the questionnaires Sunday evening. By not filling out the ESM Hunting Experience questionnaires promptly following the hunting experience, the youth hunter may have forgotten significant features of the hunt including, but not limited to, number of deer seen and particular aspects of the hunt that may have been memorable to the overall experience. Although recall error may have occurred, it was not measured.

The Background Survey, ESM Hunting Experience Survey, and Hunting Experience and Satisfaction instruments proved to be a viable way to examine youth subjects in a purely recreational context. However, the limited timeframe of this special youth hunt (2 days), was a limitation to the success or failure of data collection through weather considerations, time constraints and the commitment of youth and mentor hunting partners.

Theoretically, this research was a new and innovative way to apply flow theory utilizing hunting from the context of a recreational activity and youth ages 12 to 16 as the sample age range. Results suggest that this theoretical model can be expanded to include the ability to predict youth "flow" occurrences as hearing deer and other game, and seeing, white-tailed deer. The results of hypothesis 2 support measuring "flow" and merits further research on a larger scale as well as application of flow theory in context of other recreational activities. However, based on the results of the hypothesis testing in this study, there were several limitations by utilizing flow theory. First, based on hypothesis 1, the four-channel model was not able to adequately predict that youth hunters would likely be in a state of "flow" or "anxiety" as opposed to a state of "boredom" or "apathy" while deer hunting. I believe that if youth were constantly

hearing and seeing game, results of the hypothesis testing may have been positive (e.g., woodcock, grouse, pheasants). However, since white-tailed deer hunting is typically an activity where the hunter "sits" on-stand for long periods of time, this hypothesis should be revised in future research to accommodate for this hunting technique. Second, flow theory could not adequately explain differences among pooled-within-group factors as indicated by results of the discriminant analysis. In this particular study and based on the sample, it was not possible to model the overall experience and satisfaction after the hunt as a function of "flow." These results were largely due to the lack of a test hypothesis because nearly all respondents intending to go hunting in the future. This is also important as it supports the notion that flow theory was developed to measure in-situ recreational experiences (Hektner et al., 2007; Jones et al., 2000). Overall, flow theory is an excellent theoretical model to assist in understanding specific events for specific populations of people in an effort to provide more information about psychological aspects of young people, but it is not without its limitations.

Methodologically, a series of valid and reliable instruments were developed and implemented that successfully measured a variety of constructs related to a youth's: (1) hunting background, (2) experience during Michigan's Special Youth Firearm White-tailed Deer Hunt, and (3) overall experience and satisfaction of the hunting experience. Application of the ESM informed the researcher about the opportunities that benefit young hunters through understanding perceived feelings, interest, and mood during a hunting experience. This study also applied a methodological approach that utilized open-ended questions about a youth's experience during the youth hunt, which provided the researcher an authentic youth voice to support quantitative metrics of this exploratory study. Unfortunately, there was an inverse relationship between female ESM Hunting and Hunting Experience and Satisfaction ratings, where enjoyment of the

hunt was rated. Therefore, additional testing of the instruments in other hunting venues needs to be completed to determine validity and reliability of the items/scales for this particular question. One of the major challenges and future implications of this type of research is the use of this methodological approach for data collection at Michigan Hunter Education courses. Young people and their parent(s) or guardian(s) in attendance at Hunter Education classes are there for one reason, to get certified to hunt in Michigan! Therefore, utilization of Michigan Apprentice Hunting License and Junior Hunting license data may be a more advantageous avenue to obtain a sample in an effort to achieve a higher response rate and larger sample.

This exploratory research developed practical aspects for understanding youth whitetailed deer hunters (ages 12 to 16). This approach and methodology contributed to a better understanding of a young hunters intrinsic and extrinsic motivation and intention to continue hunting in the future. Practically speaking, this exploratory research and the processes used to conduct this study can better inform state wildlife agencies in an effort to develop larger scale research to understand youth hunters and thereby potentially providing additional involvement opportunities for recruitment of Michigan's youth hunting and non-hunting populations for the future. Providing "flow"-like educational opportunities in Michigan Hunter Education courses has the potential to leave everlasting impacts on young people. These positive educational impacts may provide the impetus for a young person to become a hunter and continue hunting. Examples of these experiences may include personal stories and anecdotal evidence by Hunter Education instructors during class. Additionally, instructors may consider providing youth with experiences such as going outdoors and hearing and seeing wildlife as part of the Hunter Education course.

#### Recommendations

The application of flow theory (Csikszentmihalyi, 1975) and the four-channel model of "flow" (Massimini & Carli, 1988) to youth deer hunters in this exploratory study are both innovative and groundbreaking. Surveying and analysis of responses by youth deer hunters about their background experiences related to hunting, in-situ hunting experiences, and experiences and satisfaction of the hunt at the conclusion of hunting experiences was a new way to understand youth and their experiences during Michigan's Special Youth Firearm White-tailed Deer Hunt.

This study also adds to the current body of research that has been developed with regard to young hunters experience and satisfaction in Michigan (Langenau & Mellon, 1980) and hunting involvement research (Decker and Purdy, 1986). This exploratory research also has the potential to be expanded on a larger scale and used by state wildlife agencies for decisionmaking purposes in the areas of hunter recruitment and providing opportunities to measure initiation of hunting to youth populations.

Recommendations for the future include adaptation and implementation of this survey methodology in hunting situations where "flow" occurs more often than a white-tailed deer hunting experience that is characterized by constant states of "boredom" followed by fleeting moments of "flow." Forms of hunting where hunters and game are constantly on the "move" are more indicative of experiences similar to rock climbing as cited by Csikzentmihalyi (1975). These types of recreational hunting experiences may include rabbit, grouse, woodcock, and pheasant hunting. In these situations, hunters are constantly on the move and game has the potential to move at any point and time during the hunt. Additionally, turkey hunting may provide a venue for implementation of this methodological approach. Turkey hunting may be

characterized by activities that include: finding, calling, setting up decoys, and responding to calls from turkeys. Finally, the Michigan Special Youth Waterfowl Hunt provides an opportunity to apply this methodological protocol in a setting centric to youth hunters and where hunters are more likely to see more wildlife during the hunt and thus are more likely to experience situations of "anxiety," and "flow," than that of "boredom" or "apathy." The Michigan Special Youth Waterfowl Hunt at managed waterfowl areas also provides an opportunity to pre-test (Background Survey) youth at the check-in station prior to the hunt, then post-test (Hunting Experience and Satisfaction Survey) youth as they provide hunt administrators with the registration cards and harvested birds after the hunt. Additionally, upon completion of the surveys, young hunters could place completed forms in the on-site drop-box to decrease potential for non-response bias.

This exploratory research also recommends the utilization of existing secondary MDNR data (Michigan Apprentice or Junior Hunting License) to frame a study with a larger, and more representative random sample size. Applying this research methodology to Michigan Apprentice Hunting License data would also provide a better understanding of those youth that purchase a Michigan Junior Hunting License in successive years after the apprentice experience or dropout of hunting after taking Michigan Hunter Education. Further, these data would be important in determining youth retention and churn rates of young hunters in Michigan. Utilizing Michigan Apprentice Hunting License data would also provide a better understanding of those youth that take Michigan Hunter Education, or simply decide not to hunt after their Apprentice Hunting experience.

This exploratory research suggests that there is a direct relationship between positive youth-mentor relationships during the Michigan Special Youth Firearm White-tailed Deer Hunt

experience and intention to continue hunting in the future. Therefore, I would recommend that the MDNR consider development of additional special mentored youth opportunities to hunt in Michigan. These opportunities may include special youth turkey, bear, and elk hunts.

Young hunters that participated in this study indicated a strong desire to go white-tailed deer hunting on the opening day of Michigan's firearm white-tailed deer season (November 15). However, even more compelling, those same young hunters indicated that they would be more likely go hunting if the opening day of the firearm white-tailed deer hunting season opened on a Saturday that was closest to November 15. Although the purposeful sample was small, these questions merit further study in a larger setting.

In Michigan, The Department of Natural Resources and Hunter Education certify approximately 25,000 individuals annually. Of those 25,000, 12 to 16 year old youth make up about 41% of Michigan Hunter Education graduates each year. Michigan Hunter Education (MHE) provides opportunities for individuals to understand aspects of safe hunting, firearm mechanics and understanding, firearm safety, hunting ethics, and wildlife conservation and management. MHE instructors educate people both young and old in an effort to foster successful and safe hunting experiences.

In this exploratory study several positive aspects were brought to bear that have the ability to inform instructors about young people ages 12 to 16 and the ability to get them in the field and keep them hunting over time. From the Background Survey data, and based on the research from this exploratory study (Michigan's Special Youth Firearm White-tailed Deer Hunt), mentors are a significant feature of the hunt. Additionally, the Background Survey suggests that an interested, trusted adult is an integral component of a youths' participation in hunting. I would recommend that instructors develop a mentorship program for their younger

graduates. It may be that we are losing potential hunters before they even have the opportunity to hunt if there is no adult support.

Another important aspect that came from this research is that male and female youth may think and feel differently about not only the hunting experience, but also the experiences that lead up to the hunt. MHE instructors may want to consider developing their courses for specific populations (e.g., female only) in an effort to structure learning based on age or gender of the group. This educational methodology has the ability to provide young people with experiences in the classroom that model their personal interests. For example, female youth respondents were more attuned to the preparation and comfort of the hunt, enjoying nature as a component of the hunt, and overall experience during their deer hunting experience than males. Providing Hunter Education courses that are centric to white-tailed deer hunting and preparation of the hunt with a mentor in the class has the ability to provide experiences that may be more interesting to students. Experiential activities in a Hunter Education course may include taking females out on a nature walk or providing opportunities to prepare for a hunt, whereas males were more interested in aspects related to shooting, seeing deer, and talking with their mentor while hunting. Therefore providing educational experiences that are more centric to the extrinsic factors of the hunt may help to foster interest in male hunters. For example, instructors may have their students learn how to score deer antlers, set traps, and work with firearms as ways to provide hands-on experiences.

This research also provides insight into opportunities to apply the ESM methodology in other venue besides Michigan Hunter Education courses. Currently the Michigan Department of Natural Resources offers Recreation 101 or REC 101. Recreation 101 courses provide introductory recreational topics taught by DNR staff and expert volunteers in specific areas of

interest at state parks throughout Michigan. Additionally, the Carl T. Johnson Hunt and Fish Center in Cadillac, Michigan provides opportunities to learn more about hunting and fishing through education and outreach. Finally many other Michigan Department of Natural Resources Education and Outreach opportunities exist that may also be potential venues to apply this methodological approach including: Archery in the Schools, Becoming an Outdoor Woman, Exploring Bowhunting, and Recreational Archery Programs.

In summary, although hunter numbers have increased recently according to a preliminary report by the U.S. Fish and Wildlife Service (FHWAR, 2012), research suggests that as the overall population continues to increase, the proportion of the population that hunts is likely to decrease more so than the absolute number of hunters (Geist, 2006; Jacobson & Decker, 2006; Organ & Fritzell, 2000; Zinn, Manfredo, & Barro, 2002). This exploratory research has provided important information about young hunters that find "flow" when hearing deer and other animals, and seeing white-tailed deer. This study also provides an excellent segue for future research that provides the opportunity to assist in recruitment and retention efforts to ensure that recreational hunting is viable and sustainable to Michigan's future.

APPENDICES

#### Appendix A: Parental consent and youth assent form.

## Measuring "Flow" and the Potential For Hunter Recruitment In Michigan Youth Firearm Deer Hunters

## PARENTAL CONSENT AND YOUTH ASSENT FORM

#### Study's Purpose

Outdoor recreation and leisure are an important component of life in Michigan. The purpose of this research is to collect data from youth at their Michigan Hunter Education class and while they are taking part in the Michigan Special Youth Firearm White-tailed Deer Hunt. The goal of collecting this information is to better understand youth and their perceptions about hunting, interest and challenge while hunting, satisfaction about the hunt, and intention to continue hunting in the future.

#### What your son/daughter will do

As part of this study, you are being asked to give your permission for your son or daughter to participate in this study. During this study we will be asking your son or daughter to fill out questionnaires in a packet that you will receive. In this packet your son or daughter is being asked to fill out surveys before, during and after the hunting experience. If necessary, please feel free to assist your son or daughter by reading or clarifying the survey questions. When we say "you" in this consent form we mean you or your child. You are giving permission to participate in this research during the Michigan Hunter Education course and during Michigan's special youth white-tailed deer hunt on September 22 and 23, 2012.

#### Risks and Benefits

Your participation in this study does not entail any additional effort or time on your part. We perceive that the risks associated with participating in this study are low. This study will benefit the future of youth hunting in Michigan and participants in Michigan Hunter Education.

#### Privacy and Confidentiality

In the analysis and storage of the data, we will use a coding system that keeps your son or daughters identity separate from their specific data. No individuals will be identified in the final research reports or articles, nor will any quotes or paraphrases be attributed to individuals by name. We will also be sure that contextual descriptions do not reveal your son or daughter's identity. The research data will be stored securely in locked files for three years and be made available only to the researchers associated with this study. The privacy of your son or daughter's information will be protected to the maximum extent of the law.

#### Your Permission

Participating in this study is completely voluntary. You are under no pressure or obligation to agree to have your son or daughter take part in this study. You may withdraw your permission at any time without any penalties. If you agree to the terms of participation, please 1) enter your name and your son or daughter's name and, 2) return the form to the researchers.

## Contact Information

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury please contact, Michael W. Everett (MSU, 140 Natural Resources Building, 480 Wilson Road, East Lansing, MI, 48824 or <u>everettm@msu.edu</u> or 517-432-0292) or Dr. Chuck Nelson, Ph.D. (MSU, 142 Natural Resources Building, 480 Wilson Road, East Lansing, MI, 48824 or <u>nelsonc@msu.edu</u> or 517-432-0272).

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail <u>irb@msu.edu</u> or regular mail at 207 Olds Hall, MSU, East Lansing, MI, 48853.

Your signature below means that you voluntarily agree to participate in this research study.

Signature

Signature of Assenting Child (12-16)

You will be given a copy of this form to keep.

Date

Date

## Appendix B: Letter to parents and youth participants explaining research.

#### Dear Parents,

Thank you for letting your child take part in this study. The goal of this research is to understand youth hunting experiences. To do this I am asking for your support and your child's involvement. Please give your consent and your son or daughter's assent by completing Consent Form attached to this document.

At your child's Michigan Hunter Education course I will be asking them to complete the Background Survey. The goal of this survey is to understand your child by recording age and gender, then ask about their interests related to outdoor activities and hunting.

The next part of the study will take place during the special youth firearm deer hunt, September 22 and 23, 2012. You will receive a packet at the Michigan Hunter Education course to be filled out by your son or daughter during the youth hunt and immediately following the youth hunt. There are directions for each of the surveys within the packet. If needed, please feel free to read the survey questions or assist your son or daughter with any questions they have about the survey.

During the Daily Hunting Survey phase of the study your child will be asked to fill out a survey at noon and at 9:00 p.m. on both days. Additionally, while you and your child are hunting we would ask that they utilize the Wildlife Inventory that is found for each day. I understand that your son or daughter may not hunt both days. However, we hope that they go hunting at least once. Please do not allow your child to take the survey when in a situation that may be considered unsafe or if it is disruptive to the hunt.

Finally, your son or daughter will take the Hunting Experience and Satisfaction Survey after they are done hunting. This may occur if they only hunt once or at the conclusion of the youth hunt Sunday evening. The goal of this phase of the study is to understand information that is pertinent to your child's deer hunting experience and their future intentions about hunting.

After completion of the surveys, place them in the self-addressed, stamped envelope that is provided.

Thank you in advance for your assistance,

Michael Everett Michigan State University 140 Natural Resources Building 480 Wilson Road East Lansing, MI 48824 e-mail: <u>everettm@msu.edu</u>

## Appendix C: Background survey directions for youth firearm deer hunters.

Hello Youth Deer Hunters,

Thank you for taking the time to be a part of this study.

The purpose of this study is to better understand young hunters. I am collecting information about your interests and skills based on your feelings at the current moment.

This survey should take less than 10 minutes for you to do.

## Directions for You

- Please take a few minutes to fill out this survey while at your hunter safety course.
- Answer honestly: there are no right or wrong answers.
- If you have any questions please contact me at everettm@msu.edu or 517-581-5888

## Appendix D: Background youth hunting interest survey.

Background Youth Hunting Interest Survey

The first three questions are being asked to create a coding system to preserve the confidentiality of your name. Please answer the same way on all of the surveys.

1. 2. 3.	What are the first three letters of your favorite athlete? (last name)
4. 5. 6. 7.	How old are you? □ 12 □ 13 □ 14 □ 15 □ 16 I am a □ Male□ Female Have you hunted with a firearm prior to taking this course? □ Yes □ No If yes, who did you go with? (Check all those that apply)
	□ Mom □ Dad □ Brother □ Sister □ Grandparent □ Aunt □ Uncle □ Cousin □ Friend □ Neighbor □ Other (please specify)
8.	Did you have a Michigan Apprentice Hunting License before taking the course?
9.	Have you ever gone hunting with others before you were able to shoot? $\Box$ Yes $\Box$ No
10.	If yes, who did you hunt with? (Check all those that apply) $\Box$ Mom $\Box$ Dad $\Box$ Brother $\Box$ Sister $\Box$ Grandparent $\Box$ Aunt $\Box$ Uncle $\Box$ Cousin $\Box$ Friend $\Box$ Neighbor $\Box$ Other (please specify)
11.	Does your best friend hunt?
12.	Did you watch a TV show, DVD, or video about deer hunting in the last year? □ Yes □ No
13.	If yes, how many hours per week do you watch these shows? $\Box < 1$ hour $\Box = 1-2$ hours $\Box = 2-3$ hours $\Box = 3-4$ hours $\Box > 4$ hours
14.	Did you do any gaming (PS, Xbox, Wii, Internet, etc.) about deer hunting in the last year?

# If yes, how many hours per week did you play these games? $\Box < 1$ hour $\Box = 1-2$ hours $\Box = 2-3$ hours $\Box = 3-4$ ho

 $\square$  3-4 hours  $\Box > 4$  hours

Please rate the following statements about you. Circle the number that best describes you for each activity. 11 -

		Don't				Really
	Activity	Enjoy				Enjoy
16.	Being in the outdoors	1	2	3	4	5
17.	Watching wildlife	1	2	3	4	5
18.	Hunting	1	2	3	4	5
19.	Fishing	1	2	3	4	5
20.	Hiking	1	2	3	4	5
21.	Camping	1	2	3	4	5
22.	Shooting sports (archery, firearms, etc.)	1	2	3	4	5
23.	Sports	1	2	3	4	5
24.	Gaming (PS, Xbox, Wii, Internet, etc.)	1	2	3	4	5

15.

## Appendix E: ESM hunting survey directions for youth firearm deer hunters.

Hello again Youth Deer Hunters,

Thank you for taking the time to be a part of this study.

The purpose of this study is to better understand hunters like you. My goal is to understand your mood, interest, and challenge regarding your hunting experience. Please complete the survey at a time when it is safe and appropriate. You are being asked to fill out this survey at noon and 9:00 p.m. on both Saturday, September 22 and Sunday, September 23 of the Michigan Special Youth Firearm White-tailed Deer Hunt.

Additionally, in the survey booklet you will find a wildlife inventory. If you have time in the field, please keep track of the wildlife that you see when you are out hunting. Note that there is an AM and PM inventory for both Saturday and Sunday.

Each survey should take less than 10 minutes for you to do.

## Directions for You

- Beginning at noon on September 22, 2012, please complete the Saturday noon survey in the packet.
- Answer honestly: there are no right or wrong answers.
- While you are in the field hunting, take some time and count the wildlife you see. Write down what you see on the wildlife inventory.
- Fill out the next survey at 9:00 p.m.
- Repeat the procedure on Sunday.
- There are several questions where you have the opportunity to write your response. We want to hear from you so please tell us all about your hunt. If you need more room to write, feel free to write on the back of the survey. Also, if you need help from your parents to take the survey please feel free to ask them for assistance.
- If you have any questions please contact me at everettm@msu.edu or 517-581-5888.

## Appendix F: ESM (AM/PM) Hunting Survey Instrument.

(Saturday AM, Saturday PM, Sunday AM, Sunday PM) Hunting Survey

The first three questions are being asked to create a coding system to preserve the confidentiality of your name. Please answer the same way on all of the surveys.

1.	What are the first three letters of your favorite athlete? (last name)	
2.	animal?	
3.	food?	

- Did you hunt deer this (Sat AM, Sat PM, Sun AM, Sun PM)?
   □ No □ Yes (If yes go to Q6)
- 5. If no, what was the ONE main reason you didn't hunt?
- 6. Do you plan to hunt anymore during this year's youth firearm deer season? □ No □ Yes
- 7. What is the ONE most important reason for this?

If you did not hunt during this period, you are done with this questionnaire. If you did hunt, please continue.

8. If you did hunt, where did you spend most of your hunting time? (Check the most appropriate box)
□ Own property □ Relative's property □ Friend's property

Own property	$\Box$ Relative's property	$\Box$ Friend's property
$\Box$ Public Land	$\Box$ Other (please explain)	

9. What did you think about most often when hunting today? (Check the most appropriate box)

10. I saw \_\_\_\_\_ deer during this hunt.

\*\*\*\*

. .

11.Did you hear deer or other animals that you couldn't see? $\Box$  No $\Box$  Yes

12.	What other animals did you see besides deer t	oday?
13.	Did you shoot at a deer?	$\Box$ No $\Box$ Yes (If no go to Q21)
14.	Did you hit a deer but could not find it?	$\Box$ No $\Box$ Yes

. .. . .

15. Did you shoot and tag a deer this (AM/PM)?  $\Box$  No  $\Box$  Yes (If no go to Q21)

16.	Did the deer you tagged have one or both an	tlers	3" or lo	nger?			
			$\Box$ No	) ⊓ Y	es (If ye	es go to (	219)
17.	Was it a deer with smaller antlers?					-	
			$\Box$ No	) □Y	es (If ye	es go to (	219)
18.	Was it a doe?		$\Box$ No	o ⊡Y	es		
	V	ery				Very	
	E	Bad	Bad	OK	Good	Good	
19.	How would you rate the experience of						
	finding the deer after harvest?	1	2	3	4	5	
20.	How would you rate the experience of						
	field dressing the deer after harvest?	1	2	3	4	5	
Indica	ate how you felt about hunting this (AM/PM):						
		1	Not at all			Ve	ry much
21.	How challenging was this hunting experience	e?	1	2	3	4	5
22.	How important was this hunting experience	to yo	ou? 1	2	3	4	5
23.	How skilled did you feel on this hunt?	•	1	2	3	4	5
24.	Did you wish you had been doing something	g else	? 1	2	3	4	5
25.	Was this hunting experience interesting?		1	2	3	4	5
26.	How important is hunting to your future goa	ls?	1	2	3	4	5
27.	Will you talk about this hunt with friends?		1	2	3	4	5
28.	Will you talk about this hunt with family?		1	2	3	4	5
Descr	tibe your interest level when hunting this AM/I	PM:					
		1	Not at all	l		Ve	ry much
29.	Did you enjoy this hunting experience?		1	2	3	4	5
30.	Was this hunting experience interesting?		1	2	3	4	5
31.	Did you do the best you could on this hunt?		1	2	3	4	5
32.	Did you feel in control of this hunting exper	ience	e? 1	2	3	4	5
33.	Did you feel good about yourself when hunt	ing?	1	2	3	4	5
34.	Are you getting better at hunting?		1	2	3	4	5

Did you feel good about yourself when hunting? 2 2 33. 1 Are you getting better at hunting? 34. 1

Describe your mood as you reflect on the (morning/afternoon) hunt. Were you:

			0	,		0 0
		Not		Neither		Very
35.	Нарру	1	2	3	4	5
36.	Active	1	2	3	4	5
37.	Proud	1	2	3	4	5
38.	Relaxed	1	2	3	4	5
39.	Strong	1	2	3	4	5
40.	Sociable	1	2	3	4	5
41.	Excited	1	2	3	4	5
42.	Friendly	1	2	3	4	5

What was the ONE most interesting thing that happened during this hunting experience? 43.

## Appendix G: Youth hunt wildlife inventory.

(Saturday AM, Saturday PM, Sunday AM, Sunday PM) Wildlife Inventory

The first three questions are being asked to create a coding system to preserve the confidentiality of your name. Please answer the same way on all of the surveys.

What are the first three letters of your favorite... athlete? (last name)
 animal?
 food?

In the space below place an / for each animal that you see. For example, if I see four deer I will make a / for each deer seen (See below).

4. White-Tailed Deer (Example: //// = 4)	5. Wild Turkeys	6. Squirrels
7. Rabbits	8. Raccoons	9. Opossums
10. Chipmunks	11. Geese or Ducks	12. Coyotes
13. Foxes	14. Songbirds (e.g., Chickadees, Blue jays, Cardinals, Robins)	15. Others

## Appendix H: Hunting experience and satisfaction survey directions.

Hello again youth deer hunters,

You're almost done!

This is the last part of the study. For part three of the study please take a few minute to provide some information about your overall experience. I would like to see how many times you went hunting and how you felt during the hunting experience.

This survey should take less than 10 minutes for you to do.

## Directions for You

- Please take the hunting experience survey, which is located on the last page of your packet.
- Answer honestly: there are no right or wrong answers.
- After you have completed the last survey, place the booklet in the self-addressed and stamped envelope provided and put it in the U.S. Mail.
- If you have any questions please contact me at everettm@msu.edu or 517-581-5888.

## Appendix I. Hunting experience and satisfaction survey instrument.

## Hunting Experience and Satisfaction Survey

The first three questions are being asked to create a coding system to preserve the confidentiality of your name. Please answer the same way on all of the surveys.

1.	What are the first three letters of your favorite	athlete? (last name)	
2.		animal?	
3.		food?	

For those who hunted one or more times during the youth firearm deer season September 22-23, 2012 please answer questions 4 to 13.

	Vet	ry				Very
	Ba	ıd	Bad	OK	Good	Good
4.	Circle how you would rate your overall experience 1 during the youth deer hunt?		2	3	4	5
5.	What is the ONE most important reason for your ratin the space below)	ıg in	questic	on #4?	(Please	answer in
6.	Circle how you would rate your preparation for the 1 youth deer hunt?		2	3	4	5
7.	What is the ONE most important reason for your ratin the space below)	ıg in	questic	on #6?	(Please	answer in
8.	Circle how you would rate your level of comfort 1 during the youth deer hunt?		2	3	4	5
9.	What is the ONE most important reason for your ratin the space below)	ıg in	questic	on #8?	(Please	answer in
10.	Circle how you would rate the amount of deer you 1 saw during the hunt?		2	3	4	5

11. What is the ONE most important reason for your rating in question #10? (Please answer in the space below)

- 12. Circle how you would rate the time you spent 1 2 3 4 5 hunting with your adult hunting partner?
- 13. What is the ONE most important reason for your rating in question #12? (Please answer in the space below)

Whether you hunted in the 2012 youth firearm season or not, please answer questions 14 to 22.

- 14. Will you go deer hunting during the 2012 archery deer season?  $\Box$  Yes  $\Box$  No  $\Box$  Maybe
- 15. Will you go firearm deer hunting on the opening day of the firearm deer season, November 15<sup>th</sup>, 2012?
   □ Yes □ No □ Maybe
- 16. What is the ONE most important reason for your answer to the opening day of firearm deer season question?
- 17. If the regular opening day of firearm deer season were to always open on a Saturday, would you be more likely to hunt on opening day?
   □ Yes □ No □ Maybe
- 18. Will you or have you gone hunting for other game in 2012?

		□ Yes	□ No	□ Maybe	
Ifvor	check all those you	have	r will h	unt for	

yes, check all	mose you have	or will fluint to	1.	
🗆 Rabbit	Squirrel	□ Grouse	Pheasant	$\square$ Woodcock
□ Duck	□ Goose	□ Turkey	□ Bear	□ Coyote

20. Will you go trapping in 2012?  $\Box$  Yes  $\Box$  No  $\Box$  Maybe

19.

21. Do you plan to continue to hunt in future years?  $\Box$  Yes  $\Box$  No  $\Box$  Maybe

22. What is the ONE most important reason for your plans about hunting in the future?

Thank you for taking the time to be a part of this study.

LITERATURE CITED

## LITERATURE CITED

- Adams, C. E., Brown, R. D., & B. J. Higginbotham. (2004). Developing a strategic plan for future hunting participation in Texas. *Wildlife Society Bulletin*, 32(4), 1156-1165. doi: 10.2193/0091-7648(2004)032[1156:DASPFF]2.0.CO;2
- Aebischer, N. J. (2009). Gamebird Science, Agricultural Policy and Biodiversity Conservation in Lowland Areas of the UK. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 197-211). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch12
- AFWA (Association of Fish and Wildlife Agencies). (2011). Association of Fish and Wildlife Agencies Core Concepts. On website: http://jjcdev.com/~fishwild/?section=conservation education core concepts.
- Ardrey, R. (1976). *The Hunting Hypothesis: A Personal Conclusion Concerning the Evolutionary Nature of Man.* New York, NY: Bantam Books Inc.
- Bassi, M., & Delle Fave, A. (2010). Impact of Extreme Weather Conditions on High Altitude Climbers' Goals and Quality of Experience. *Journal of Leisure Research*, 42(3), 469-488.
- Bassi, M., & Delle Fave, A. (2004). Adolescence and the Changing Context of the Optimal Experience in Time: Italy 1986-2000. *Journal of Happiness*, 5, 155-179. doi: 10.1023/B:JOHS.0000035914.66037.b5
- Bauer, J., & Herr, A. (2004). Hunting and Fishing Tourism. In K. Higginbottom, (Ed.), Wildlife Tourism: Impacts, Management and Planning (pp. 57-75). Common Ground Publishing Pty Ltd, Altona, Vic. On website: http://SustainableTourism.Publisher-Site.com.
- Bauer, J., & Giles, J. (2002). *Recreational Hunting-An International Perspective*, Wildlife Tourism Research Report Series No.13. CRC, Sustainable Tourism. Australia: Goldcoast.
- Boone and Crockett Club. (2008). *Fair Chase Statement*. Boone and Crockett Club, On Website, http://www.boone-crockett.org/huntingEthics/ethics\_fairchase.asp?area=huntingEthics.
- Booth, V. R., & Cummings, D. H. M. (2009). The Development of a Recreational Hunting Industry and its Relationship with Conservation in Southern Africa. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 282-295). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch17

- Borrie W. T., & Roggenbuck, J. W. (1995). The use of verbal reports in outdoor recreation research: Review, recommendations, and new directions. In J. L. Thompson, D. W. Lime, B. Gartner, & W. M. Sames (Eds.), *Proceedings of the Fourth International Outdoor Recreation and Tourism Trends Symposium*, University of Minnesota Extension Service, St. Paul, MN, 367-361.
- Bruzzese, J. M., & Fisher, C. B. (2003). Assessing and Enhancing the Research Consent Capacity of Children and Youth. *Applied Developmental Science*, 7(1), 13-26. doi:10.1207/S1532480XADS0701\_2
- Butler, M. J., Teaschner, A. P., Ballard, W. B., & McGee, B. K. (2005). Commentary: Wildlife ranching in North America arguments, issues and perspectives. *The Wildlife Society Bulletin*, 33(1), 381-389.
  doi: http://dx.doi.org/10.2193/00917648(2005)33[381:CWRINA]2.0.CO;2
- Chavez, E. J. (2008). Flow in Sport: A Study of College Athletes. *Imagination, Cognition, and Personality*, 28(1), 69-91.
- Chiutsi, S., Mukoroverwa, M., Karigambe, P., & Mudzengi, B. K. (2011). The theory and practice of ecotourism in Southern Africa. *Journal of Hospitality Management and Tourism*, 2(2), 14-21.
- Clawson, M., & Knetsch, J. L. (1966). *Economics of outdoor recreation*. Baltimore, MD: Johns Hopkins University Press.
- Cleland, C. E. (1992). *Rites of Conquest: The History and Culture of Michigan's Native Americans*. Ann Arbor, MI: The University of Michigan Press.
- Condon, R. G., Collings, P., & Wenzel, G. (1995). The Best Part of Life: Subsistence Hunting, Ethnicity, and Economic Adaptation among Young Adult Inuit Males. *Arctic*, 48(1), 31-46.
- Connelly, N. A., Brown, T. L., & Decker, D. J. (2003). Factors affecting response rates to natural resource-focused surveys: Empirical evidence of declining rates over time. *Society and Natural Resources*, 16(6), 541–547. doi: http://dx.doi.org/10.1080/08941920309152
- Cordain, L., Miller, J. B., Eaton, S. B., Mann, N., Holt, S. HA, & Speth J. D. (2000). Plantanimal subsistence ratios and macronutrient energy estimations in worldwide huntergatherer diets. *American Journal of Clinical Nutrition*, 71, 682-692.
- Cornicelli, L., Fulton, D. C., Grund, M. D., & Fieberg, J. (2011). Hunter Perceptions and Acceptance of Alternative Deer Management Regulations. *Wildlife Society Bulletin*, 35(3), 323-329. doi: 10.1002/wsb.51

Csikszentmihalyi, M. (1975). Beyond boredom and anxiety. San Francisco, CA: Jossey-Bass.

- Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. New York, NY: Bookspan.
- Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal Experience: Psychological Studies of Flow in Consciousness* (pp. 15-35). Cambridge, UK: Cambridge University Press.
- Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (1988). Introduction to Part IV. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (eds.), *Optimal Experience: Psychological Studies of Flow in Consciousness* (pp. 251-265). Cambridge, UK: Cambridge University Press.
- Csikszentmihalyi, M., & J. Hunter. (2003). Happiness in Everyday Life: The Uses of Experience Sampling. *Journal of Happiness Studies*, 4(2), 85-199. doi: 10.1023/A:1024409732742
- Csikszentmihalyi, M. (1997). *Finding Flow. The psychology of engagement with everyday life.* New York, NY: Basic Books.
- Csikszentmihalyi, M. (1992). A response to the Kimiecik & Stein and Jackson papers. *Journal of Applied Sport Psychology* 4(2), 181-183. doi: 10.1080/10413209208406460.
- Csikszentmihalyi, M., & Kleiber, D. A. Kleiber. (1991). Leisure and Self-Actualization. In B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of Leisure*, (pp. 91-102). State College, PA: Venture Publishing, Inc.
- Csikszentmihalyi, M., & Larson, R. (1987). Validity and reliability of the experience sampling method. *The Journal of Nervous and Mental Disease*, 175, 526-536. doi: 10.1097/00005053-198709000-00004.
- Csikszentmihalyi, M., & Larson, R. (1984). *Being adolescent: Conflict and growth in the teenage years*. New York, NY: Basic Books.
- Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented Teenagers: The Roots* of Success & Failure. New York, NY: Cambridge University Press.
- Da Silveira R., & Thorbjarnarson, J. B. (1999). Conservation implications of commercial hunting black and spectacled caiman in the Mamiraua Sustainable Development Reserve, Brazil. *Biological Conservation*, 88, 103-109. doi: http://dx.doi.org/10.1016/S0006-3207(98)00084-6
- Davies, R., Hamman, K., & Magome, H. (2009). Does Recreational Hunting Conflict with Photo-Tourism? In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 233-251). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch14

- Decloe, M. D., Kaczynski, A. T., & Havitz, M. E. (2009). Social Participation, Flow and Situational Involvement in Recreational Physical Activity. *Journal of Leisure Research*, 41(1), 73-90.
- Decker, D. J., Brown, T. L., & Siemer, W. F. (2001). *Human Dimensions of Wildlife Management in North America*. Bethesda, MD: The Wildlife Society.
- Decker, D. J., Brown, T. L., & Gutierrez, R. J. (1980) Further insights into the multiplesatisfaction approach for hunter management. *Wildlife Society Bulletin*, 8(4), 323-331.
- Decker, D. J. & Purdy, K. G. (1986). Becoming a Hunter: Identifying Stages of Hunting Involvement For Improving Hunter Education Programs. *Wildlife Society Bulletin*. 14(4), 474-479.
- Delle Fave, A., & Massimini, F. (2003). Optimal experience in work and leisure among teachers and physicians: Individual and bio-cultural implications. *Leisure Studies*, 22, 323-342.
- Dizard, J. E. (2003). *Mortal stakes: Hunters and hunting in contemporary America*. Amherst, MA: University of Massachusetts Press.
- Dratch, P., & Kahn, R. (2011). Moving Beyond the Model. In L. Moore LaRoe (Ed.), *The Wildlife Professional*. 5(2), (pp. 61-63). Bethesda, MD: The Wildlife Society.
- Driver, B. L., Brown, P. J., & Peterson, G. L. (1991). Research on Leisure Benefits: An Introduction to This Volume. In B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of Leisure*, (pp. 3-11). State College, PA: Venture Publishing, Inc.
- Duda, M. D., Jones, M. F., & Criscione A. (2010). The Sportsman's Voice, Hunting and Fishing in America. State College, PA: Venture Publishing Inc. DOI:10.1080/10871209.2012.653599
- Duda, M. D., Bissell, S. J., & Young, K. C. (1995). *Factors related to hunting and fishing participation in the United States*. Harrisonburg, VA: Responsive Management.
- Duffus D. A., & Dearden, P. (1990). Non-consumptive wildlife-oriented recreation: A conceptual framework. *Biological Conservation*, 53(3), 213-231. doi: http://dx.doi.org/10.1016/0006-3207(90)90087-6
- Eid M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personal correlates. *Journal of Personality and Social Psychology*, 76(4), 662,-676. doi: 10.1037/0022-3514.76.4.662
- Elkington, J. (2007). Partnerships from Cannibals with Forks: The Triple Bottom Line of 21<sup>st</sup>-Century Business. *Environmental Quality Management*, 8(1), 37-51. doi: 10.1002/tqem.3310080106

- Ellis, G. D., Voelkl, J. E., & Morris, C. (1994). Measurement and analysis issues with explanation of variance in daily experience using the flow model. *Journal of Leisure Research*, 26(4), 337-356.
- Enck, J. W., Decker, D. J., & Brown, T. L. (2000). Status of Hunter Recruitment and Retention in the United States. *Wildlife Society Bulletin*, 28(4), 817-824.
- Fennell D., & Nowaczek, A. (2010). Moral and empirical dimensions of human—animal interactions in ecotourism: deepening an otherwise shallow pool of debate. *Journal of Ecotourism*, 9(3), 239-255. doi:10.1080/14724041003741519
- Festa-Bianchet, M., & Lee, R. (2009). Guns, Sheep, and Genes: When and Why Trophy Hunting May Be a Selective Pressure. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 95-107). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch6
- Fortier, J. (2009). The Ethnography of South Asian Foragers. *The Annual Review of Anthropology*, 38, 99-114. doi: 10.1146/annurev-anthro-091908-164345
- Frawley, B. J. (2010). Michigan Deer Harvest Survey Report: 2009 Seasons. Michigan Department of Natural Resources and Environment, *Wildlife Report No. 3513*.
- Frawley, B. J. (2008). Michigan Deer Harvest Survey Report 2007 Season. Michigan Department of Natural Resources, *Wildlife Report No. 3485*.
- Frawley, B. J. (2006). Demographics, Recruitment, and Retention of Michigan Hunters: 2005 Update. Michigan Department of Natural Resources, *Wildlife Report No. 3462*.
- Frisina M.R., & Tareen, S. N. A. (2009). Exploitation Prevents Extinction: Case Study of Endangered Himalayan Sheep and Goats. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 142-156). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch9
- Geist, V. (2006). The North American Model of Wildlife Conservation: A means of creating wealth and protecting public health while generating biodiversity. In D. M. Lavigne (Ed.), *Gaining Ground: In Pursuit of Ecological Sustainability* (pp. 285-293). Guelph Ontario, Canada: International Fund for Animal Welfare and University of Limerick, Ireland. doi: http://dx.doi.org/10.1663/0013-0001(2007)61[306:GGIPOE]2.0.CO;2
- Geist, V. (2010). The Carnivorous Herbivore: Hunting and Culture in Human Evolution. In N. Kowalsky (Ed.), *Hunting: Philosophy for Everyone* (pp. 121-133). West Sussex, UK: Wiley-Blackwell Publications, John Wiley & Sons Ltd. doi: 10.1002/9781444327694.ch10

- Geist, V., Mahoney, S. P., & Organ, J. F. (2001). Why hunting has defined the North American model of wildlife conservation. *Transactions of the North American Wildlife and Natural Resources Conference*, 66, 175–185.
- Goodale T. L., & Cooper, W. (1991). Philosophical Perspectives on Leisure in English-Speaking Countries. In B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of Leisure*, (pp. 25-35). State College, PA: Venture Publishing, Inc.
- Godbey, G. C., & Jung, B. (1991). Relations Between the Development of Culture and Philosophies of Leisure. In B. L. Driver, P. J. Brown, and G. L. Peterson (Eds.), *Benefits* of Leisure, (pp. 37-45). State College, PA: Venture Publishing, Inc.
- Groves, R. M. (1987). Research on Survey Data Quality. *Public Opinion Quarterly*, 51, S156-S172.
- Hammitt, W. E., McDonald, C. D., & Patterson, M. E. (1991). Determinants of Multiple Satisfaction for Deer Hunting. *Wildlife Society Bulletin*, 18(3), 331-337.
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience Sampling Method: Measuring the Quality of Everyday Life*. Thousand Oaks, CA: Sage Publications.
- Hicks, J., Ramanathan, N., Kim, D., Monibi, M., Selsky J., Hansen, M., & Estrin, D. (2010). AndWellness: An Open Mobile System for Activity and Experience Sampling. *Wireless Health*, October 5-7, 1-10. doi: 10.1145/1921081.1921087
- Hofer, D. (2002). The Lion's Share of the Hunt. Trophy Hunting and Conservation, A Review of the Legal Eurasian Tourist Hunting Market and Trophy Trade Under CITES. *TRAFFIC* Europe.
- Hogarth, R. M., Portell, M., & Cuxart, A. (2007). What Risks Do People Perceive in Everyday Life? A Perspective Gained from the Experience Sampling Method (ESM). *Risk Analysis*, 27(6), 1427-1439. doi: 10.1111/j.1539-6924.2007.00978.x
- Holin, D. & Lemons, T. (2010). Subsistence Harvests and Uses of Wild Resources in Lime Village, Alaska, 2007. Alaska Department of Fish and Game, Division of Subsistence: Technical Paper No. 355, Anchorage, AK.
- Howe C. Z., & Rancourt, A. M. (1990). The importance of definitions of selected concepts for leisure inquiry. *Leisure Sciences*, 12(4), 395-406. doi:10.1080/01490409009513117
- Humle T. & Kormos, R. (2011). Chimpanzees in Guinea and in West Africa. In T. Matsuzawa et al. (Eds.), *The Chimpanzees of Bossou and Nimba, Primatology Monographs* (pp. 393-401). Springer Scientific-Business Media B.V.
- Ibrahim, H., & Cordes, K. A. (2002). *Outdoor Recreation: Enrichment for a Lifetime, Second Edition.* Champaign, IL: Sagamore Publishing.
- Jacobson, C. I., & Decker, D. J. (2006). Ensuring the Future of State Wildlife Management: Understanding Challenges of Institutional Change. *Wildlife Society Bulletin*, 34(2), 531-536. doi: http://dx.doi.org/10.2193/0091-7648(2006)34[531:ETFOSW]2.0.CO;2
- Jackson, S. A., & Marsh, H. W. (1996). Development and Validation of a Scale to Measure Optimal Experience: The Flow State Scale. *Journal of Sport & Exercise Psychology*, 18, 17-35.
- Jensen, C. R., & Guthrie, S. P. (2006). *Outdoor Recreation in America, 6<sup>th</sup> Edition*. Champaign, IL: Human Kinetics.
- Jones B. T. B. (2009). Community Benefits from Safari Hunting and Related Activities in Southern Africa. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 158-177). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch10
- Jones, C. D., Hollenhorst, S. J., Perna, F., & Selin, S. (2000). Validation of the Flow Theory in an On-Site Whitewater Kayaking Setting. *Journal of Leisure Research*, 32(2), 247-261.
- Kahneman, D., & Krueger, A. B. (2006). Developments in the Measurement of Subjective Well-Being. *Journal of Economic Perspectives*, 20(1), 3-24. doi: http://dx.doi.org/10.1257/089533006776526030
- Kamal, A. A., Khamir, M. S. A., & Yunus, F. W. (2010). The Perception and Constraints Towards Recreational Activity Among Female Students. *International Journal of Sports Management, Recreation & Tourism.* 6, 62-75. doi: 10.5199/ijsmart-1791-874X-6d
- Kerr, G. N., & Woods, A. (2010). New Zealand Big Game Hunting Values: A benefit transfer study. Canterbury, NZ: Land Environment & People Research Report No. 23. Lincoln University.
- Kimiciek, J., & Stein, G. (1992). Examining flow experiences in sport contexts: conceptual issues and methodological concerns. *Journal of Applied Sports Psychology*, 4, 144, 160. doi:10.1080/10413209208406458
- Knox, M. W. (2011). The Antler Religion. *Wildlife Society Bulletin*, 35(1), 45-48. doi: 10.1002/wsb.5
- Koppedrayer, K. (2010). Big Game and Little Sticks: Bowmaking and Bowhunting. In N.
  Kowalsky (Ed.), *Hunting: Philosophy for Everyone* (pp. 198-209). West Sussex, UK: Wiley-Blackwell Publications, John Wiley & Sons Ltd.
  doi: 10.1002/9781444327694.ch16
- Kümpel, N. F., Milner-Gulland, E. J., Cowlishaw, G., & Rowcliffe, J. M. (2010). Incentives for Hunting: The Role of Bushmeat in the Household Economy in Rural Equatorial Guinea. *Human Ecology*, 38, 251-264. doi: 10.1007/s10745-010-9316-4

- Lamprey, R. H., & Mugisha, A. (2009). The Re-Introduction of Recreational Hunting in Uganda. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 212-232). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch13
- Langenau, E. E., & Mellon, P. M. (1980). Characteristics and Behaviors of Michigan 12- to 18-Year-Old Hunter. *The Journal of Wildlife Management*. 44(1), 69-78.
- Lefevre, J. (1988). Flow and the quality of experience during work and leisure. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), *Optimal Experience: Psychological Studies of Flow in Consciousness* (pp. 307-318). Cambridge, UK: Cambridge University Press.
- Leader-Williams, N. (2009). Conservation and Hunting: Friends or Foes. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 9-24). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch1
- Lewis, D. E., & Kaiser, H. F. (1991). Managerial Needs for Information on Benefits of Leisure. In B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of Leisure*, (pp. 21-24). State College, PA: Venture Publishing, Inc.
- Loveridge, A. J, Packer, C., & Dutton, A. (2009). Science and the Recreational Hunting of Lions. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 109-124). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch7
- Loveridge, A. J., Reynolds, J. E., & Milner-Guilland, E. J. (2006). Does sport hunting benefit conservation? In D. Macdonald, & K. Service (Eds.), *Key Topics in Conservation Biology* (pp. 224-240). Oxford, UK: Blackwell. doi:10.1080/00207230601100039
- Mahoney, S. P. (2009). Recreational Hunting and Sustainable Wildlife Use in North America. In B. Dickson, J. Hutton, & W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 255-281). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch16
- Manfredo, M. J., Fix, P. J., Teel, T. L., Smeltzer, J., & Kahn, R. (2004). Assessing demand for big-game hunting opportunity: applying the multiple satisfaction concept. *Wildlife Society Bulletin*, 32(4), 1147-1155. doi: 10.2193/0091-7648(2004)032[1147:ADFBHO]2.0.CO;2
- Mannell, R. C., Zuzanek, J., & Larson, R. (1988). Leisure states and "flow" experiences: perceived freedom and intrinsic motivation hypotheses. *Journal of Leisure Research*, 20(4), 289-304.

Maslow, A. H. (1943). A Theory of Human Motivation. Psychological Review, 50(4), 370-396.

- Massimini, F., & Carli, C. (1988). The systematic assessment of flow in daily experience. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), *Optimal Experience: Psychological Studies of Flow in Consciousness* (pp. 266-287). Cambridge, UK: Cambridge University Press.
- Mazzullo, N. (2010). More than meat on the hoof? Social significance of reindeer among Finnish Saami in rationalized pastoralist economy. In F. Stammler, & H. Takakura (Eds.), Good to Eat, Good to Live with: Nomads and Animals in Northern Eurasia and Africa (pp. 101-119). Tohoku University, Sendai: Center for Northeast Asian Studies.
- McCullough D. R., & Carmen, W. J. (1981). Management Goals for Deer Hunter Satisfaction. *Wildlife Society Bulletin*, 10(1), 49-52.
- McGee, J. B. (2010). Subsistence Hunting and Fishing in Alaska: Does Anilca's Rural Subsistence Priority Really Conflict with the Alaska Constitution? *Alaska Law Review*, 27(2), 221-255.
- McIntyre, N., & Roggenbuck, J. W. (1998). Nature/Person Transactions During An Outdoor Adventure Experience: A Multi-Phasic Analysis. *Journal of Leisure Research*, 30(4), 401-422.
- McNeely, J. A., Kapoor-Vijay, P., Zhi, L., Olsvig-Whittaker, L., Sheikh, K. M., & Smith, A.T. (2009). Conservation biology in Asia: the major policy challenges. *Conservation Biology*, 23, 805-810. doi: 10.1111/j.1523-1739.2009.01284.x
- Mehmood, S., Zhang, D., & Armstrong, J. (2003). Factors associated with declining hunting license sales in Alabama. *Human Dimensions of Wildlife*, 8(4), 243-262. doi:10.1080/716100423
- Michigan Department of Natural Resources (MDNR). (2011). *Hunter Education*. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/dnr/0,1607,7-153-10363 39267---,00.html.
- Michigan Department of Natural Resources (MDNR). (2011a). *Apprentice Hunting License*. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/dnr/0,4570,7-153-10363\_14518-32236--,00.html.
- Michigan Department of Natural Resources (MDNR). (2011b). *Today's Hunter in Michigan: A guide to hunting responsibly and safely*. Kalkomey Enterprises Inc., Dallas, TX.
- Michigan Department of Natural Resources (MDNR). (2011c). New Law Creates Mentored Hunting for Youth for 2012 Season. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/dnr/0,4570,7-153-10363\_58977-259924--,00.html.

- Michigan Department of Natural Resources (MDNR). (2011d). *Time Zone A-Bear, Deer, Fall Wild Turkey, Furbearer and Small Game Hunting Hours Table*. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/documents/dnr/Hunting hours Sept-March 329373 7.pdf.
- Michigan Department of Natural Resources (MDNR). (2001). *What is the Michigan Natural Resources Trust Fund (MNRTF)*. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/dnr/0,1607,7-153-39002\_16791-39513--,00.html.
- Michigan Department of Natural Resources (MDNR). (2008). *Michigan Statewide Comprehensive Outdoor Recreation Plan (SCORP) – 2008-2012*. Michigan Department of Natural Resources, Lansing, MI. On website: http://www.michigan.gov/dnr/0,4570,7-153-37984-176508--,00.html.
- Minzenberg, E., & Wallace, R. (2011). Amazonian agriculturalists bound by subsistence hunting. *Journal of Cultural Geography*, 28(1), 99-121. doi:10.1080/08873631.2011.548482
- Mitchell, R. G. (1983). *Mountain Experience: the psychology and sociology of adventure*. Chicago, IL: The University of Chicago Press.
- Muth, R. M., Dick, R. E., & Blanchard, K. A. (2001). Subsistence Use of Wildlife and Native Peoples' Wildlife Issues. In D. J. Decker, T. L Brown, & W. F. Siemer (Eds.), *Human Dimensions of Wildlife Management in North America* (pp. 329-351). Bethesda, MD: The Wildlife Society.
- NSSF (National Shooting Sports Foundation). (2009). *A portrait of Hunters and Hunting License Trends: National Report.* Southwick Associates/National Shooting Sports Foundation, Newtown, CT.
- NSSF/IHEA (National Shooting Sports Foundation and International Hunter Education Association). (2000). Meeting the Challenge to Increase Participation in Hunting and Shooting. *Produced for the U.S. Fish and Wildlife Service Division of Federal Aid*, Newtown, CT. On website, http://6fbd21e64bc817fd097aa54148bd3dab37bc10ee.gripelements.com/documents/ttank final.pdf, accessed October 13, 2009.
- Nelson, M. P., Vucetich, J. A., Paquet, P.C., & Bump, J. K. (2011). An Inadequate Construct? In L. Moore LaRoe (Ed.), *The Wildlife Professional*. 5(2), (pp. 58-60). Bethesda, MD: The Wildlife Society.
- Nijman, V. (2010). An overview of international wildlife trade from Southeast Asia. *Biodiversity* and Conservation, 19, 1101-1114. doi: 10.1007/s10531-009-9758-4

- Organ, J. F., & Fritzell, E. K. (2000). Trends in Consumptive Recreation and the Wildlife Profession. *Wildlife Society Bulletin*, 28(4), 780-787.
- Organ, J. F., Muth, R. M., Dizard, J. E., Williamson, S. J., & Decker, T. A. (1998). Fair Chase and Humane Treatment: Balancing the Ethics of Hunting and Trapping. Transactions of the 63<sup>rd</sup> North American Wildlife and Natural Resources Conference, Orlando, Florida, 20-24 March, 1998.
- Ormrod, J. E. (1995). *Educational psychology: Principles and applications*. Englewood Cliff, NJ: Merrill.
- Parry, L., Barlow, J., & Peres, C. A. (2009). Hunting for Sustainability in Tropical Secondary Forests. *Conservation Biology*, 23(5), 1270-1280. doi: 10.1111/j.1523-1739.2009.01224.x
- Peloquin C., & Berkes, F. (2009). Local Knowledge, Subsistence Harvests, and Social-Ecological Complexity in James Bay. *Human Ecology*, 37, 533-545. doi: 10.1007/s10745-009-9255-0
- Peterle, T. J. (1977). Hunters, Hunting, Anti-Hunting. Wildlife Society Bulletin, 5(4), 151-161.
- Petersen, D. (2010). *Heartsblood: Hunting, Spirituality, and Wildness in America*. Raven's Eye Press, Durango, CO.
- Pink, D. H. (2011). *Drive: The Surprising Truth About What Motivates Us.* New York, NY: Riverhead Trade.
- Posewitz, J. (1994). *Beyond Fair Chase: The Ethic and Tradition of Hunting*. Helena, MT: Falcon Guides.
- Prayaga P., Rolfe, J., & Stoeckl, N. (2010). The value of recreational fishing in the Great Barrier Reef, Australia: A pooled revealed preference and contingent behavior model. *Marine Policy*, 34, 244-251. doi: http://dx.doi.org/10.1016/j.marpol.2009.07.002
- Regan, T. (2001). *Defending Animal Rights*. Urbana and Chicago, IL: University of Illinois Press.
- Reis H. T., & Gable, S. L. (2000). Event-sampling and other methods for studying everyday experience. In H. T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social* and personality psychology (pp. 190-222). New York, NY: Cambridge University Press.
- Responsive Management. (2006). *Sportsmen's attitudes*. Harrisonburg, VA: Responsive Management.

- Responsive Management/National Shooting Sports Foundation (RM/NSSF). (2008). *The Future* of Hunting and Shooting Sports: Research-Based Recruitment and Retention Strategies. Produced for the U.S. Fish and Wildlife Service under Grant Agreement CT-M-6-0. Harrisburg, VA.
- Riley S. J., Decker, D. J., Enck, J. W., Curtis, P. D., & Lauber, T. B. (2003). Deer populations up, hunter populations down: Implications of interdependence of deer and hunter population dynamics on management. *Ecoscience*, 10(4), 455-461.
- Roggenbuck, J. W. (2004) Managing for Primitive Recreation in Wilderness. *International Journal of Wilderness*. 10(3), 21-24.
- Ryan, E. L., & Shaw B. (2011). Improving Hunter Recruitment and Retention. *Human Dimensions of Wildlife*, 16(5), 311-317. doi:10.1080/10871209.2011.559530
- Sasaki, S. (2010). Voices of Hunters on Socialist Modernisation: From a Case Study of the Udehe in the Russian Far East. *Inner Asia*, 12, 177-197. doi: http://dx.doi.org/10.1163/146481710792710327
- Scollon, C. N., Kim-Prieto, C., & Diener, E. (2003). Experience Sampling: Promises and Pitfalls, Strengths and Weaknesses. *Journal of Happiness Studies*, 4, 5-34. doi: 10.1023/A:1023605205115
- Scruton, R. (2010). The Sacred Pursuit: Reflections on the Literature of Hunting. In N. Kowalsky (Ed.), *Hunting: Philosophy for Everyone* (pp. 187-197). West Sussex, UK: Wiley-Blackwell Publications, John Wiley & Sons Ltd. doi: 10.1002/9781444327694.ch15
- Sharp, R., & Wollscheid, K. U. (2009). An Overview of Recreational Hunting in North America, Europe and Australia. In B. Dickson, J. Hutton, & W.M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 25-38). Oxford, UK, Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch2
- Schüler, J., & Brunner, S. (2009). The rewarding effect of flow experience on performance in a marathon race. *Psychology of Sport and Exercise*, 10, 168–174. doi: 10.1016/psychsport.2008.07.001
- Siehl, G. H., & Kostmayer, P. H. (1991). Needs for Information on Leisure Benefits in the Legislative Process. In B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of Leisure*, (pp. 13-19). State College, PA, Venture Publishing, Inc.
- Singer, P. (1993). *Practical Ethics*, 2<sup>nd</sup> Edition. Cambridge, UK: Cambridge University Press.

Singer, P. (1995). Animal Liberation, 2<sup>nd</sup> Edition. London, UK: Pimlico.

- Skinner, B. F. (1938). *The Behavior of Organisms: An experimental analysis*. New York, NY: D. Appleton-Century Company.
- Sodhi, N. S., Koh, L. P., Brook, B. W., & Ng, P. K. L. (2004). Southeast Asian biodiversity: an impending disaster. *TRENDS in Ecology and Evolution*. 19(12), 654-660. doi: http://dx.doi.org/10.1016/j.tree.2004.09.006
- Stein, G., Kimiciek, J., Daniels, J., & Jackson, S. (1995). Psychological antecedents of flow in recreational sport. *Personality and Social Psychology Bulletin*, 21(2), 125-135. doi: 10.1177/0146167295212003
- Swan, J. A. (1995). In Defense of Hunting. San Francisco, CA: HarperCollins Publishers, Inc.
- Tegt, J., Mayer, J., Dunlap, J., & Ditchkoff, S. (2011). Plowing Through North America. In L. Moore LaRoe (Ed.), *The Wildlife Professional*. 5(2), (pp. 36-39). Bethesda, MD: The Wildlife Society.
- Thompson, A. M., Rehman, L. A., & Humbert, M. L. (2005). Factors Influencing the Physically Active Leisure of Children and Youth: A Qualitative Study. *Leisure Sciences*. 27(5), 421-438. doi:10.1080/01490400500227324
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau (FHWAR). (2012). 2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation-Preliminary Findings. Washington, D.C.
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau (FHWAR). (2007a). 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation. Washington, D.C.
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau (FHWAR). (2007b). 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation-Michigan. Washington, D.C.
- U.S. Fish and Wildlife Service. (2013). Pittman-Robertson Wildlife Restoration-FY13 Budget Justification. On website: http://www.fws.gov/budget/2013/PDF%20Files%20FY%202013%20Greenbook/24.%20 Wildlife%20Restoration.pdf
- U.S. Fish and Wildlife Service-Southeast Region. (2010). Federal Aid Division-The Pittman-Robertson Federal Aid in Wildlife Restoration Act. On website: http://www.fws.gov/southeast/federalaid/pittmanrobertson.html.
- van Vleit, N., Nasi, R., & Taber, A. (2011). From the Forest to the Stomach: Bushmeat Consumption from Rural to Urban Settings in Central Africa. In S. Shackleton et al. (Eds.). *Non-Timber Forest Products in the Global Context, Tropical Forestry* 7 (pp. 129– 145). Berlin-Heidelberg, GE: Springer-Verlag. doi: 10.1007/978-3-642-17983-9\_6

- Vaske, J. J. (2008). Survey Research and Analysis: Application in Parks, Recreation and Human Dimension. State College, PA: Venture Publishing Inc.
- Vercauteren, K. C., LaVelle, M. J., Seward, N. W., Fischer, J. W., & Phillips, G. E. (2007). Fence-line Contact Between Wild and Farmed White-Tailed Deer in Michigan: Potential for Disease Transmission. *Journal of Wildlife Management*. 71(5), 1603-1606. doi: 10.2193/2006-179
- Wall, B., & Child, B. (2009). When Does Hunting Contribute to Conservation and Rural Development. In B. Dickson, J. Hutton, and W. M. Adams (Eds.), *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (pp. 256-265). Oxford, UK: Blackwell Publishing Ltd. doi: 10.1002/9781444303179.ch15
- Winkler, R., & Warnke, K. (2012). The future of hunting: an age-period-cohort analysis of deer hunter decline. *Population and Environment*, Original Paper, 1-21. doi: 10.1007/s11111-012-0172-6
- Wöran, B., & Arnberger, A. (2012). Exploring Relationships Between Recreation Specialization, Restorative Environments and Mountain Hikers' Flow Experience. *Leisure Science*, 34, 95-114. doi: 10.1080/01490400.2012.652502
- World Forum on the Future of Sport Shooting Activities (WFSA). (2010). *World Symposium* on the Ecologic and Economic Benefits of Hunting. Proceedings of the Symposium on Hunting activities, Windhoek, Namibia, 14-17 September, 2009.
- Zinn, H. C., Manfredo, M. J., & Barro, S. C. (2002). Patterns of Wildlife Value Orientations in Hunters' Families. *Human Dimensions of Wildlife*, 7, 147-162. doi:10.1080/10871200260293324
- Zuzanek, J. (1999). Experience sampling method: Current and potential research applications. Paper presented at the Workshop on Time-use Measurement and Research, National Research Council, Washington, D.C. On website, http://www.lifestress.uwaterloo.ca/images/ESM.pdf, accessed October 24, 2011.