

**FROM THE MOUTHS OF HUNTERS: HUNTER PERCEPTIONS IMPROVE UNDERSTANDING OF THE
RELATIONSHIP BETWEEN HUNTERS AND CONSERVATION IN CANADA**

by

Maya Basdeo

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Authors Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

As a group of nature-based outdoor recreationists, hunters in Canada are not well understood, particularly in the context of their role in conservation. Hunters in Canada are not typically equated with being conservation actors, however there is a dearth of current academic literature that addresses the relationship between hunting and conservation in Canada and thus hunters may not accurately be represented within conservation circles. Collaboration between different groups of conservationists could be improved, and gaining a better understanding of how hunters perceive their place in conservation may contribute to greater unity around issues of conservation concern.

The research question I explored was “Do hunters in Canada perceive they contribute to conservation, and if so, in what ways?”. I used an anonymous online questionnaire to survey hunters across Canada using Qualtrics as the survey tool. The survey link was distributed through six provincial and territorial hunting-conservation organizations affiliated with the Canadian Wildlife Federation: Ontario Federation of Anglers & Hunters, Manitoba Wildlife Federation, Saskatchewan Wildlife Federation, Alberta Wildlife Federation, B.C. Wildlife Federation, and Yukon Fish & Game Association. The survey consisted of 23 questions and was conducted over a six-week period in the fall of 2023. 4022 valid responses were received from every province and territory, with the majority from Ontario.

Four key themes emerged from the survey results of hunters in Canada: hunters identified more strongly as conservationists than as hunters, hunters identified numerous ways in which they participate in and support conservation, hunters are political actors, and hunters can be allies for conservation. Focusing on hunter perceptions was a necessary first step in exploring the relationship between hunters and conservation in Canada. The breadth of these results highlight opportunities for further empirical research and the need for more research to be conducted in Canada on this topic.

Key Words: conservation, hunting, Canada, Canadian Wildlife Federation, qualitative survey, North American Model

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Dedication

I dedicate this work to conservationists of all shades of green, including “camo”. May you work towards each other with open hearts and minds for the greater conservation good, and as a demonstration of love for this land of Canada.

To borrow words of wisdom from the great Rachel Carson:

“Conservation is a cause that has no end. There is no point at which we will say our work is finished.”

And for Marzy, who was the original inspiration for this work, the ideas of which hatched in 2004.

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Chapter 1

Introduction

The idea of hunters as conservationists can be controversial in North America, and globally. Ideological positions about hunting, distrust between factions of conservationists, diverging ideas about conservation, and assumptions about hunter attitudes and values toward nature are some of the underlying reasons for this polarity. One of the implications is that hunters may be marginalized from meaningful participation in conservation as a result (Paulson, 2012).

Efforts to understand the relationship between outdoor recreationists and conservation orientations began as a field of study in North America during the 1970s with a growing awareness about the links between being connected to nature and espousing conservation behaviour (Dunlap & Van Liere, 1978; Rosa & Collado, 2019; Whitburn et al., 2020). Much of the research linking conservation to outdoor recreation has been preoccupied with identifying values and attitudes of recreation groups, the results of which are questionable due to inconsistencies in both study methods and results (Bernstein & Szuster, 2019; Teisl & O'Brien, 2003). Little research has focused on conservation behaviour of individual groups of outdoor recreationists.

(Cooper et al., 2015; Dunlap & Heffernan, 1975; Larson et al., 2015, 2018; Teisl & O'Brien, 2003) Since the late 19th century, Canada and the United States have shared similar, if not complementary, trajectories regarding conservation (Sandlos, 2013), including the evolution of how conservation is defined and understood (Mace, 2014). Existing primary research about how hunters currently participate in conservation is limited, particularly in a Canadian context, with insights drawn mostly from cross-sectional research in the United States in which hunters are a portion of outdoor recreationists studied, and conservation activities are a subset of a larger suite of pro-environmental behaviours (Cooper et al., 2015; Dunlap & Heffernan, 1975; Larson et al., 2015, 2018; Teisl & O'Brien, 2003). The result is that there are significant gaps about hunters in Canada as a group of nature-based outdoor recreationists, and how they engage with conservation.

1.1 Research Questions and Objectives

The research questions I sought to answer was “Do hunters in Canada perceive they contribute to conservation, and if so, in what ways?”. Related to this primary question, I was also interested in exploring if hunters identify as conservationists, what they think and feel about conservation and nature, what they perceive as threats to nature and wildlife, if they experience barriers to participating in conservation, and how they feel they are perceived by non-hunting conservationists. The intent was to address current gaps in this area of research and potential misconceptions about hunters in Canada that may have arisen and persisted based on research that has taken place primarily in the United States and/or has not asked hunters directly about their thoughts and action regarding conservation. Insights about how hunters view conservation can help hunting and conservation communities and organizations determine areas for collaboration and reduce barriers for hunter participation. In addition to filling gaps in academic literature, results of this research can be incorporated into environmental management and governance regimes by NGOs and various government agencies.

This exploratory research is notable since it appears to be the first academic study of its kind in Canada on the topic of conservation that specifically focuses on hunters as participants. Having a focus on one subset of outdoor recreationists addresses recommendations made by previous researchers who study the relationship between outdoor recreation and conservation (e.g., Cooper et al., 2015; Thapa, 2010). It is national in scale and achieved a large sample size (N=4022). The findings may inform new empirical research about hunting, biodiversity conservation, and outdoor recreation. Finally, the research design can be adapted for exploration of conservation opinions and practice for other outdoor recreation groups in Canada and elsewhere.

1.2 Thesis Structure

Requisite background information is presented in a review of the literature (Chapter 2), including a discussion about how conservation has been viewed and defined over the past 150 or so years in Canada and the United States, and the implications of various definitions for hunters being accepted as conservationists. A brief discussion about the North American Model of Wildlife Conservation is included, as well as how outdoor recreationists tend to be framed. Chapter 2 concludes with a summary of existing empirical research on hunters and conservation in North America.

Chapter 3 on methodology begins with a presentation of the research approach and underlying philosophy that guided the selection of the research design. Each element of the research design and survey methods are presented, and their use in the development and execution of the survey, including responses, are provided. This chapter closes with analysis of data, including preparing and validating survey responses, and an explanation of using a descriptive analysis.

Chapter 4 is dedicated to a presentation and brief description of results and includes tables and figures to illustrate findings. These findings are discussed at greater depth in the discussion section (Chapter 5), which organizes findings into four thematic topics. Concluding thoughts, next steps and ideas for future research follow in Chapter 6. Appendices at the end of the thesis are referenced in the main text of this document and can be easily accessed using embedded reciprocal links.

Chapter 2

Review of Literature

The focus of my research is on ways in which hunters in Canada perceive and participate in conservation. Although there is a wealth of literature from multiple disciplines that discuss conservation in a North American context, empirical research on types of conservation in which hunters currently participate in North America is limited. This literature review therefore addresses the key tenets of the topics most directly relevant to my research and provides context in which the empirical results and subsequent discussion may be considered.

1.3 Conservation

Conservation of biological diversity has been a growing concern for decades, yet efforts are failing (Sandbrook et al, 2019). Lack of a clear definition of conservation, and disunity among conservationists' objectives and strategies may be among the underlying reasons (Norton, 1991). Conservation is a term with multiple meanings and used in a wide range of circumstances. Mulder & Coppolillo (2005, p.xv) note that not all contexts in which the term 'conservation' is used refer to nature, biological diversity of plants and animals, or natural resources as they occur in support of ecosystems and habitats. However, even when referring to conservation of biodiversity and natural resources directly, differences persist about how conservation is and should be defined and what approach should be taken (Armitage et al., 2020). These differences may be due to several factors.

First, conservation is studied and pursued through multiple disciplines, each with their own unique perspectives. For example, Bennett et al. (2017) identified eighteen different disciplines within the social sciences that address conservation, each with their own areas of focus and application. Second, conservationists have different ideals regarding the purposes and end goals of conservation. For example, Sandbrook et al. (2010, p.290) outline a range of conservation objectives and ideals held by conservation professionals, some of which are mutually exclusive (e.g., "biodiversity should be conserved to ensure human survival" versus "the value of biodiversity does not depend on its usefulness to people"). Bruskotter et al. (2019) argue that ways in which groups of people self-identify (e.g., animal rights advocate, farmer, hunter), in addition to identifying as conservationists, may

exacerbate differences rather than focus on common areas of concern. However, the authors focus on Wildlife Value Orientations to make this assertion, which polarizes groups into espousing “domination” and “mutualism” values. Sandbrook et al. (2010) contend that opportunities for more complex, nuanced discussion focused on solutions is hindered by the tendency to use simplistic and binary categories. Third, ideas that frame conservation itself have changed several times, notably since the 1960s, resulting in multiple views that now exist simultaneously (Mace, 2014). While two binary views of conservation (sustainable use and protectionism) have been used regularly since the early 1900s, additional orientations that have arisen during and since the 1960s include anthropocentrism, biocentrism, new conservation, and inclusive, or plural conservation (Table 1).

Conservation ideology in a broad sense became notable in post-colonial North America during the late 19th and early 20th centuries as part of the first wave of the environmental movement (Sandlos, 2013). This first wave was in response to unregulated market hunting and harvesting of wildlife, timber, and other natural resources, when efforts arose in both Canada and the United States to conserve wilderness and wildlife (MacDowell, 2012; Norton, 1991; Peek, 2019). While several high-profile and influential conservation-oriented individuals spoke out against wanton destruction of wild animals and natural environments, including the oft cited U.S. President Theodore Roosevelt, two American men became, and remain, associated with distinct and arguably divergent views of conservation: Gifford Pinchot and John Muir (Norton, 1991). Pinchot, a forester and eventual chief of the U.S. Forest Service, promoted the idea of sustainable use of resources based on scientific evidence (also referenced as ‘wise use’ and what continues to be considered ‘traditional’ conservation), while Muir, a naturalist and explorer, supported the idea of preserving wilderness in the absence of people (also became known as ‘fortress conservation’); two distinct, dichotomous views that persist among contemporary conservationists (MacDowell, 2012; Soulé & Press, 1998).

Conservation concepts in North America have shifted in how people relate to and understand nature since the time of Pinchot and Muir, the framing and approach to conservation has also shifted (Mace, 2014). Table 1 provides a summary of common approaches to conservation, including key points associated with each. When considered in aggregate, these different approaches, or frameworks, reflect inconsistent and in some cases contradictory positions. An unfortunate side effect of several of

the frameworks currently in use is that they have potentially led to disunity within groups that claim to have a focus on, and interest in, conservation action. The categorization of behaviours (e.g., consumptive versus appreciative) or oversimplification of environmental values (e.g., preservation versus sustainable use), instead of focusing on conservation outcomes and areas of common concern may be part of the reason (Miller et al., 2011; Sandbrook et al., 2010). There are growing calls for approaches to conservation that are inclusive and recognize diverse values, perspectives, and traditions; rather than one conservation, a move toward “conservations” that respect differences yet work towards common ground that can better realize conservation outcomes in recognition of these challenges (Sandbrook, 2015).

Table 1*Common Approaches to Conservation*

Conservation Approach	Key Points	Example References
Sustainable Use	• Also known as “wise use”; popularly associated with Gifford Pinchot. • Wildlife and natural resources can be used providing they are not over-exploited, wasted, or misused. • Humans are a part of nature. • Using and harvesting resources for human use is natural and necessary. • Typically associated with “consumptive” use.	MacDowell, 2012; Mahoney et al., 2015; Tufts et al., 2015
Preservation/Protectionism	• Also referred to as “fortress conservation”; popularly associated with John Muir. • Nature has intrinsic value and should be protected for its own sake, regardless of human interest or benefit. • Idealized view of “wilderness” without people. • Typically associated with “appreciative” use.	MacDowell, 2012
Anthropocentric	• Nature is managed for human benefit. • Typically associated with “consumptive” use.	Mace, 2014; Schneider, 2023
Bio/Ecocentric	• Nature is maintained for nature’s benefit. • Typically associated with “appreciative” use.	MacDowell, 2012; Schneider, 2023
New Conservation	• Pragmatic approach to conservation. • Recognizes role of economy, opportunities for economic partnerships. • Aligned with concept of ecosystem services which associate a cost to the benefits that ecosystems provide to people.	Holmes et al., 2017; Kareiva, 2014; Marvier, 2014; Miller et al., 2011
Inclusive Conservation	• Promotes inclusion through acceptance of multiple conservation philosophies, diverse actors, and values which underlie them.	Gavin et al., 2018; Hill et al., 2021; Sandbrook et al., 2010; Tallis & Lubchenco, 2014

1.4 The North American Model of Wildlife Conservation

The North American Model of Wildlife Conservation (NAM) is a conservation framework that has involved hunters and ideas of sustainable use of wildlife and resources from its inception. Much literature reflects on the historical role of ethical “sportsmen” and hunter-naturalists as drivers for conservation of wildlife and wild spaces throughout North America (e.g. Geist et al., 2001; Geist & Mahoney, 2019; Heffelfinger & Mahoney, 2019; Mahoney et al., 2019; Mahoney & Jackson, 2013; Peek, 2019; Prukop & Regan, 2005). Their dedication to conservation through stewardship, advocacy, and support of scientific evidence to inform conservation policy was of key influence at a perilous time during the late 19th and early 20th centuries when unregulated market hunting, which involved killing wildlife for profit (i.e., to supply markets for feathers, meat, skins, antlers, ivory, or other commercial purposes) caused the extinction of several species and threatened many more (Geist & Mahoney, 2019; Heffelfinger et al., 2013). Considerable literature is also critical of hunters’ participation in conservation, saying both their historic and current roles are overstated, biased, and exclusionary to non-white males and non-hunting conservationists, among other criticisms (Nagle & Vidon, 2022; Peterson & Nelson, 2017).

The NAM is a compilation of seven principles (Table 2) that reflect an approach to conservation and wildlife management unique to Canada and the United States (Geist et al., 2001; Peterson & Nelson, 2017). The principles encompassed in the NAM arose at different points in the early 20th century to counter destruction and irrevocable loss of wildlife, though were first described as a conceptual framework in 1995 as a *retrospective consideration* of conservation in North America by Valerius Geist¹ (see Kisonak et al., 2024; Mahoney et al., 2019). These principles reflect the thinking of early 1900s conservationists in North America during a period of time when both Canada and the United States faced similar environmental challenges of resource overexploitation due to similar pressures of expanding settler populations and nation building and, as a result, were actively engaged in collaborating for conservation (Sandlos, 2013).

¹ For original reference, see Geist, V. (1995). North American policies of wildlife management. *Wildlife Conservation Policy*, 77-129.

Table 2*The Seven Principles of the North American Model of Conservation*

Principle	Explanation
1. Wildlife maintained as a Public Trust resource	• A fundamental principle of this framework based on the Public Trust Doctrine. • Individuals and landowners don't own wildlife or natural resources; these should be responsibly managed for the benefit of all people. • Represented a departure from ownership of wildlife by aristocracy and elites in Europe and elsewhere at the time.
2. Wildlife should not be commercially exploited	• Prohibiting "deleterious commerce", i.e., buying or selling of wildlife. • This principle is a response to the mass killing of a range of wildlife for commercial gain, also known as "market hunting" that caused severe reduction and in some cases extinction of species in North America during the 19th century.
3. Laws determine use and allocation of wildlife	• Supported use of wildlife under certain circumstances intended to counter orientation to profiting from wildlife. • Intended to facilitate equitable feedback about, and access to, wildlife for all citizens in good standing.
4. Wildlife use is for legitimate purposes only	• Intended to stop frivolous (e.g., for feathers, ivory, antlers) or reckless killing of wildlife and wastage of meat. • "Legitimate" uses determined to be harvesting animals for food or fur, or killing in self defence or protection of property.
5. Wildlife is an international resource	• Recognized need for transboundary conservation and management of migratory wildlife. • Reflected in early treaties such as the Fur Seal Treaty (1911) and the Migratory Birds Convention Act (1916).
6. Science as the basis for developing and implementing wildlife policy	• The confluence of increased interest in the value of nature during the mid-1800s to early 1900s, empirically studying nature to aid in responsible management of wildlife and natural resources, and avoiding decisions overly influenced by political interests gave rise to wildlife science. • Based on the Roosevelt Doctrine in the U.S.; described and popularized by Aldo Leopold.
7. Opportunity to harvest wildlife should be democratically determined	• Marked a departure from the European system where hunting opportunities were afforded to the ruling class or elites. • All citizens had both equal opportunity and responsibility for wildlife, though initially revolved around game species.

Note: Principles as they were originally formulated. Adapted from Mahoney & Jackson (2013) and Organ et al. (2012).

Kisonak et al. (2024) acknowledge the complexity and irreducibility of wildlife conservation in North America overall and suggest the NAM be considered in the context of legal, cultural, ecological, and historical environments in which the principles arose. Conservation policies and approaches developed during the late 19th and early 20th centuries may not have been explicitly intended to privilege consumptive use over other forms of engaging with nature as intimated by Feldpausch-Parker et al. (2017), however, the influential men who were responsible for advancing conservation legislation through sustainable use in contrast to wanton destruction of wildlife and nature during that period of time were hunters, worked in wildlife and natural resource sectors, or both (e.g., Theodore Roosevelt, Aldo Leopold, Gifford Pinchot).

Criticism of the NAM tends to centre on philosophical differences of opinion about the ethics of hunting, the role of hunters in conservation, and at times distorts what the Model is and how it is used in the process. For example, Nagle & Vidon (2022, p.80-81) assert that wildlife in the U.S. is “...managed according to the North American Model...”, and that under this model, “...fees and taxes for recreational hunting and fishing are collected by state and federal governments...”. Both assertions are skewed enough to reflect a fundamental lack of understanding about the history and evolution of the principles in the NAM. It is more accurate to say that hunting regulations reflect several of the principles in the NAM, particularly that wildlife is used for legitimate and not commercial purpose, that laws regulate the use of wildlife, that use is democratic, and guided by scientific principles. The Model itself does not prescribe fee or tax structures, or how such proceeds should be used. The authors also selectively draw overwhelmingly upon references that are critical of the NAM, arguing it objectifies animals, marginalizes Indigenous peoples, supports gender and class inequality, does not acknowledge non-hunter contributions to conservation, caters to hunters as a special interest group, and ultimately, the “...contributions of hunters to wildlife conservation are vastly over-emphasized...” in the Model.

Eichler & Baumeister (2018, p.86) similarly decry the NAM as “...perpetuating a settler colonial narrative...”, “...elevating sport hunting...” above other ways in which people relate to nature, and “...privileging an exclusionary concept of Western science...”. It is worth remembering that Canada and the United States are countries that arose out of colonial expansion, and thus our systems of law, government, governance, education, and healthcare among others were also implemented largely

before non-landowners, women, minorities, and Indigenous peoples could vote, or were considered “citizens”. Balanced discussion of the model acknowledges there were shortcomings that existed in late 19th and early 20th century proponents of conservation, namely that Indigenous perspectives were neither valued nor recognized, and call for inclusion of Traditional Ecological Knowledge to be recognized and incorporated into the NAM moving forward (Kisonak et al., 2024).

While Peterson & Nelson (2017) recognize the historical validity of the development of the NAM principals, they criticize it as being exclusionary to non-hunting conservationists, women, and minorities, noting a lack of diversity is reflected in the North American hunting community. They call for the NAM to be outright replaced by something that does not have a “myopic focus” on hunters and hunting, and determinedly assert that hunting in the 21st century doesn’t play a role in conservation or management of most species, and thus the NAM is “...undeniably biased toward people and species involved in harvesting wild animals...” (Peterson & Nelson, 2017, p.51).

Current proponents of the North American Model argue that its associated principles were of critical importance for conserving wildlife in the context of the time, recognize obvious gaps that should be rectified, and reflect a desire to continually revisit and revise the Model to ensure its efficacy in conservation. Critics of the Model, rather than recognizing the contributions to conservation made at the time and undoubtedly in the decades that followed, either superimpose current societal norms and expectations onto people and circumstances that were prominent over a hundred years ago, or reject the system of laws and principles reflected in the Model for facilitating hunting (for a range of reasons). Their focus is not on improving the Model or addressing gaps, but with removing it altogether.

The positions for and against the NAM are not engaged in the same argument. They reflect different approaches to conservation and philosophical orientations to hunting, and thus likely not resolvable. This type of conundrum reflects the crux of why conservation has not been more effective, and offers support for the idea that there should be multiple ‘conservations’ rather than arguing over which one is ‘right’. It is central to the discussion about hunting and conservation as well, as it reflects some of the inherent challenges in exploring the role of hunters in conservation in North America.

1.5 Framing of Outdoor Recreationists

Outdoor recreationists include a broad range of subgroups of people that spend time outdoors in nature (Cordell, 2008). Since the 1970s, the relationship between experiences in nature and environmental concern, as well as behaviour that is generally supportive of the natural environment (also referred to as pro-environmental behaviour, or PEB), has been studied (Rosa & Collado, 2019; Thapa, 2010; Whitburn et al., 2020). The field of study concerned with PEB does not use a standardized set of variables in self-reported surveys, and although conservation actions such as land stewardship or habitat improvement are often included as pro-environmental activities, PEB can also include behaviours such as household recycling or conserving water (Larson et al., 2015).

Some forms of outdoor recreation have been linked to an increase in conservation behaviours (e.g., Cooper et al., 2015), although there is a general lack of empirical research on the relationship between outdoor recreation and pro-conservation actions, and further research on this topic is needed (Winter et al., 2019; Larson et al., 2011). Most studies about outdoor recreation and environmental concern are cross-sectional (they are inclusive of the general population, or of several groups of recreationists in a single study), and thus there are calls for specific outdoor recreation activities to be studied individually to determine linkages between a given activity and conservation (Thapa, 2010; Teisl & O'Brien, 2003). One reason for the lack of research on specific types of activities and conservation behaviour may be due to existing assumptions about the type of impacts certain activities have, and the intentions toward nature of the respective participants in those activities, based on how outdoor activities are categorized.

The common denominator in how groups of nature-based outdoor recreationists became categorized is in an article written by Dunlap & Heffernan (1975). The authors based their analysis on previous work done by Dillman (1971), in which a survey was conducted of Washington State residents (N=3101) about how public funds should be used. Answer options for Dillman's (1971) survey included areas of environmental concern, while another set of questions in the survey polled respondents about the types of nature-based leisure activities in which they participate.

As part of their analysis, Dunlap & Heffernan (1975) divided recreational activities into two simplified groups: consumptive and appreciative. These categories were based on criteria ascribed by the

authors. Consumptive activities are described as “...typified by hunting and fishing, involve taking something from the environment and thus reflect a “utilitarian” orientation toward it...nature is viewed as existing for man’s utilization...”. They describe appreciative activities as a “contrast” to consumptive activities, and claim “...appreciative activities (e.g., camping, hiking, and photography) involve attempts to enjoy the natural environment without altering it.” Although not included in their analysis, the authors identify a third category of outdoor recreation, referring to use of all-terrain vehicles, snowmobiles, and trail bikes as “abusive”.

There are several problems with this framing of nature-based outdoor recreationists. First, the authors take great liberty in assuming what various activities mean to the people who do them, and how different recreators view and relate to nature. Second, the term “utilitarian” is not synonymous with “utilize”². The conflation of these terms combined with the association of “use” or “utilize” in reference to hunters and anglers viewing nature as being for “man’s utilization” and nothing else, creates an overly negative and inaccurate view of what hunters think, what hunting entails, and who hunters might be (e.g., this framing entirely ignores Indigenous perspectives and experiences with hunting). When compared to the description of activities that are “appreciative” – associated with campers, hikers, and basically non-hunters who are the ‘appreciators’ of nature – the contrast is even more stark and equally inaccurate. Third, the categorizing of outdoor recreation into primarily two opposing categories and framing one category having a negative impact and the other category having no negative impact is not based on evidence, yet it continues to be reiterated. In describing dimensions of experiences in nature, Clayton et al. (2017) include “consumptive vs. appreciative”. They describe consumptive as having the goal to “exploit (and modify) nature as a resource...through hunting...”, while the goal of appreciative is described as “...to simply appreciate it without considering it to be a resource, e.g., by bird watching”. Yet this framing does not necessarily reflect the goals associated with

² Merriam-Webster (n.d.) defines utilitarian as “an advocate or adherent to utilitarianism”. Utilitarianism is an ethical philosophy concerned with making decisions on the merits of realizing the greatest good for the greatest number of people; by maximizing pleasure and minimizing pain (Driver, 2025), though this is an over-simplified explanation. “Utilize” is a verb that means “to make use of” (Merriam-Webster, n.d.).

either activity, nor does it adequately identify the types of environmental impacts that can occur as a result of recreation types.

Regardless of category, all forms of nature-based outdoor recreation can have a negative impact on wildlife. Thompson (2015) found that recreational trail users, including hikers and dog-walkers (i.e., appreciative) as well as bike riders (i.e., abusive), have a negative impact on ground-dwelling birds due to habitat fragmentation that facilitates human presence, rather than due to the category of activity (activities excluded motorized vehicle use). Theoretically this would easily include nature photographers and bird watchers using trails as well, especially if they attempt to get closer to birds and wildlife for a better look. In their analysis of literature on nature-based recreation, Gruas et al. (2020) noted a key finding: most recreationists are not aware of the impact they have on nature and wildlife. They highlight that very little empirical data has been collected on outdoor recreationists overall, particularly with sports that occur in natural areas such as skiing, hiking, running, and biking. Thus, while hiking and running may be categorized as “appreciative” because they don’t involve harvesting wildlife, there is a lack of evidence that such activities have no negative impact, or that these recreationists appreciate nature more than hunters or other recreationists classified as “consumptive”.

Framing of outdoor recreation activities as “consumptive” and “appreciative” (also referred to as non-consumptive) was introduced 50 years ago and is reflective of the socioenvironmental context of the time, including being on the heels of the second wave of the environmental movement that began in the 1960s in North America. From a conservation perspective, this framing does not reflect the reality of the type or degree of impact caused by different activities on nature or wildlife. It does, however, lead to false assumptions about likely impacts of each category of activity. Regardless of its validity or accuracy in describing outdoor recreational activities and the people who partake in them, the terms “consumptive” and “appreciative” continue to be perpetuated throughout environmental literature and by wildlife management agencies and NGOs.

1.6 Using Values and Attitudes as Predictors of Behaviour

Considerable academic study has been dedicated to identifying and categorizing values, attitudes, and beliefs people have toward nature to understand and predict conservation behaviour (Sparks et al., 2021). Such efforts have been underway since the 1970s across a range of academic fields (Larson et al., 2011), contemporary with the time in which categorizing of outdoor recreational activities was taking place. The field of environmental psychology notably takes the approach of trying to develop predictive models, or frameworks, of behaviour based on identification of worldviews, values, and attitudes towards nature (Manfredo et al., 2017a; Manfredo et al., 2021; Manfredo, et al., 2017b; Moghimehfar et al., 2020; Ross et al., 2018). While there are numerous frameworks, or scales, in use, no singular theoretical framework that is reliably predictive, or globally generalizable, has yet been developed (Bernstein & Szuster, 2019). Some frameworks are, however, used more than others. Two examples of these are the Connectedness to Nature Scale (CNS) and the New Environmental Paradigm (NEP), with the NEP being used more broadly than others (Dunlap, 2008; Frantz & Mayer, 2014; Whitburn et al., 2020).

Arguably the first of such frameworks and thus foundational to the development of area of study, the NEP was created as an alternative to what the authors viewed as the Dominant Social Paradigm of the 1970s which, in a nutshell, prioritized unrestricted economic growth largely reliant on exploiting natural resources over impacts to the environment and ideas of living within sustainable means (Dunlap & Van Liere, 1978). The NEP was theoretically positioned as a worldview that reflected ideals counter to DSP, namely that economic and population growth should be limited (i.e., “limits to growth”, “steady state economy”), and that nature has intrinsic value. However, the authors developed a 12-item scale that employed, in my opinion, rather extreme statements for which participants rated their responses, including “plants and animals exists to be used primarily by humans”, and “humans must live in harmony with nature in order to survive” (Dunlap & Van Liere, 1978, p.13).

The authors cautioned that the attitude-behaviour link is prone to weakness, particularly when attitudinal findings are in response to overly vague or general issues. They also note that many people included in their sample would likely not have made a connection between supporting the NEP’s ideas and making personal or societal changes that would operationalize that support. While the NEP is

perhaps the predictive framework used the most, a meta-analysis by Sparks et al. (2021) found it did not reliably predict positive behaviours towards the environment compared to most other scales currently being used, including the CNS. This is problematic given the predominance of NEP and its use to potentially guide wildlife and ecosystem management decisions and professionals. For example, in a climate of limited or constrained funding, government agencies may rely on predictive models to inform decisions rather than conduct their own assessments.

Other problems with predictive frameworks in general are the assigning and conflating of values and attitudes with categories of outdoor recreation, and approaches to conservation that can sometimes occur. For example, in their overview of wildlife values, Manfredo et al. (2021, p.357) use only two categories of values toward wildlife in their sociocultural index: domination and mutualism. According to the authors, domination is associated with concerns about the economy, and human and private property interests. Dominators think wildlife management should purge predators from the landscape, facilitate public access to natural areas, and provide opportunities for fishing and hunting. Mutualism, on the other hand, they assert, is associated with concerns about decreases in wildlife populations, importance of protecting habitat and natural areas, and equitable inclusion of stakeholders. Mutualists think wildlife management should support environmental education, restrict public access for the benefit of wildlife, and provide opportunities to view wildlife.

A perhaps unanticipated or unintended result of assessments such as those by Manfredo et al. (2021) is that by creating or reinforcing mutually exclusive suites of values, attitudes, and behaviours (regardless of if they are real or valid), some forms of outdoor experiences (and presumably conservation actions associated with different actors) are preferentially validated above others. As a subset of outdoor recreationists in Canada, hunters may be a group for which conservation action is not typically associated or considered because hunting is framed as a consumptive activity with domination values, which do not intuitively align with conservation. Hunters in Canada thus may represent an underutilized resource as contributors to conservation.

Whitburn et al. (2020, p.191) note that “conservation actions are human behaviours” and assert the importance of having knowledge about how psychological and social elements inform behaviour. While I acknowledge a wealth of literature exists that reflect a range of perspectives about hunter

values and attitudes, or motivations for participating in conservation (e.g., Ghasemi & Kyle, 2023; Manfredo et al., 2021; Nilsson et al., 2020; Wilkins et al., 2019), it is largely not included as part of my research because it is outside the scope of my thesis. Values and attitudes are poor predictors of conservation behaviour (Gavin et al., 2018), and premature given current conservation actions by hunters in Canada are not well understood to begin with. In contrast, the primary focus of this research is on what hunters do (or say they do) regarding conservation, and the extent to which they perceive themselves as conservationists.

1.7 Hunting as a ‘Recreational’ Activity

With the exception of remote areas of the country, hunting is a form of nature-based recreation in Canada. The term ‘recreation’ differentiates it from subsistence hunting practiced in remote areas where, for example, the only realistic option for procuring fresh meat and some other foods is through hunting and other subsistence activities (subsistence may also include fishing, trapping, gathering). The term recreational also distinguishes activities as being optional in the sense that they are not commercial, no profit is gained as a result, and while it may not be preferable, options for obtaining food by non-hunting means (e.g., factory farmed meat from a grocery store) are readily available; thus hunting is not a life-or-death activity. In Canadian provincial and territorial jurisdictions, recreational hunting typically corresponds to a class of licence that reflects its difference in purpose and scope to subsistence or commercial activities and is thus managed differently in terms of tag and permit allocations, allowable harvest seasons, and where proceeds of licence sales are directed.

The term ‘recreational’ is problematic when referring to hunting, and can easily misrepresent most, if not all, forms of hunting and hunters in Canada. Nagle & Vidon (2022, p.80) refer to recreational hunting as “recreational killing sports”. Gamborg et al. (2018) stated, as if fact, that food or income is not the main motivation for people that hunt, but rather they do so for “...personal reward or enjoyment...”. While Di Minin et al. (2021, p.239) acknowledge the three classes of hunting being subsistence, commercial, and recreational, they explain recreational hunting as “...the pursuit and killing of animals for leisure and enjoyment purposes.” Although they follow up this sentence with noting there “may” be “additional” motives for hunting, the clearly reflected impression is that the primary motive for hunting is killing for enjoyment. Furthermore, the authors combine discussion of recreational hunting in North America, Europe, and Africa, with one of their main arguments being that

unsustainable hunting has an impact on biodiversity. Obviously if an activity is unsustainable, there will be deleterious impacts on biodiversity. However, hunting by licensed hunters in Canada takes place in an entirely different wildlife management and cultural context compared to other places in the world and should be recognized as such.

In Canada, hunting is carefully regulated across all provinces and territories by management agencies who endeavour to use the best available population data (including based on harvest data from hunter reports, and basing permits/tags on population estimates for the most part) with the goal of ensuring hunted populations are sustained (Heffelfinger et al., 2013; The Conference Board of Canada, 2019). From a conservation perspective, the act of hunting itself may not achieve conservation goals (though in some circumstances of overabundance, it arguably can), however, that is a narrow scope in which to consider how hunters may contribute to conservation efforts.

1.8 Empirical Conservation Research That Includes Hunters

Given the abundance of literature that addresses hunting and conservation, very little is based on empirical evidence about, or inclusive of, hunters directly. Along with calls to focus research on specific groups of outdoor recreationists, there appears to be a shift to focusing more research in North America on hunting. A relatively recent empirical study by Cooper et al. (2015) included hunters in upper New York State as part of their self-completion survey that also specified conservation actions, finding similarities between hunters and birdwatchers in the kinds of conservation behaviours each group claimed to undertake. Of note was that those who were both birdwatchers and hunters were more strongly aligned with conservation behaviours overall, with specific activities including wildlife recreation advocacy, public and private land habitat enhancement, participation in an environmental group, donating to conservation, and supporting conservation policy (Cooper et al., 2015). In a survey of residents from the state of Missouri, Rutter et al. (2022) found that both wildlife viewers and waterfowl hunters reported greater participation in wetland conservation (e.g., working on land or habitat improvement projects, volunteering, and voting to support wetland conservation) compared to other groups of recreationists, and that being a hunter was a notable predictor of participating in conservation activities compared to non-hunters. Schroeder et al. (2021) surveyed waterfowl hunters in Minnesota and found that while all respondents reported participating in the conservation activities listed to some degree, waterfowl hunters participated the most in voting for issues deemed to have an

impact on the environment, and least to volunteering for habitat improvement. Among their recommendations was that future research should expand the range of conservation activities presented, and work with hunting-conservation NGOs to further engage hunters. Snyder et al. (2022) surveyed family forest owners in the state of Wisconsin and found that those who identified as deer hunters reported greater participation in a range of beneficial activities on their woodlots, such as having a forest management plan, planting native seedlings, and removing invasive species, compared to those without a hunter identity. In a strictly Canadian context, Boulé et al. (2021) conducted 25 semi-structured interviews with a diverse group of hunters in British Columbia, and found that hunting, particularly in a rural context, supports participation in local conservation. While Hinrichs et al. (2021) focused their survey of both anglers and hunters on exploring motivations for participating in fishing and several forms of hunting, it is valuable because their sample was large (N=7875), included responses from eight U.S. states (some of which relate to some of my survey questions), and their approach to identifying motivations was based on response selections directly, rather than through predictive modelling of attitudes or values.

1.9 Rationale for Research

There are lengthy debates about which conservation philosophies, approaches, and frameworks are effective (or palatable), how conservation behaviour might be predicted, how nature-based outdoor recreationists are framed, and what values are typically, if inaccurately, associated with different forms of recreation. The intersection of hunters and conservation touch on all of them, which is in part what makes this research important and unique, especially in a Canadian context given most academic literature originates from the United States, as evidenced by my literature review.

Hunters and hunting organizations may be marginalized from widespread discussion that is framed in terms of 'conservation' or 'sustainability' which could result in exclusion of hunters and hunting-conservation organizations from environmental governance and policy decision-making. Inclusion of hunters' perspectives supports an inclusive, diverse approach in considering biodiversity conservation, but it is clear their voices are disproportionately missing or represented in academic literature in Canada.

Previous studies have mixed 'outdoor recreationists' (e.g., Cooper et al., 2015; Larson et al., 2011) in either comparison studies (hunters vs birdwatchers, or others) or have included multiple groups categorized as 'consumptive' and 'non-consumptive'. Several studies recommend the next step in this area of research is to isolate and explore specific groups of outdoor recreationists, including if and how they contribute to conservation. As such, this research focuses solely on hunters in Canada, and given what I view as fundamental problems with simplistic and inaccurate categories of outdoor recreationists, I did not use the categorical convention of 'consumptive' and 'appreciative' in my data collection methods or discussion of findings. The aim of this research is to explore if and in what ways hunters are engaged in specific conservation action in Canada. I recognize the importance of testing this proposition. However, self-perception about conservation that hunters have is a necessary first step that opens avenues for further dialogues and research about hunting and conservation in Canada.

My research questions are: do hunters in Canada perceive they contribute to conservation, and if so, in what ways? I explore additional questions about the extent to which hunters identify as conservationists, what they think about conservation, how they feel about nature, what they view as threats to conservation, barriers they may face in contributing to conservation, and how they feel they are perceived by non-hunters in the field of conservation.

Chapter 3

Methodology

This chapter provides an explanation of the research approach I used to explore how hunters in Canada perceive they contribute to conservation, and the methods I used to collect data. Given my aims of reaching both a breadth of hunters and gaining a deeper understanding of hunters in relation to conservation thought and practice, I used an online survey tool to conduct this qualitative research, guided by a pragmatic research philosophy. Characteristics of a qualitative approach, the pragmatic research philosophy that underpinned how my methodology was formed and executed, and specific elements of the design, methods of the survey, and analysis of results are discussed.

1.10 Exploratory Qualitative Approach

My research employed an exploratory qualitative approach; this was warranted given the dearth of research with hunters in Canada about conservation practices and contributions. Qualitative research emphasizes human experiences and seeks to better understand individuals or groups in relation to an issue. Per Creswell (2014, p.20), qualitative research is appropriate “...if a concept or phenomenon needs to be explored and understood because little research has been done on it...”.

Other criteria for using this approach includes that it: follows inductive reasoning, facilitates exploration of a problem or phenomenon, focuses on depth of understanding and meaning associated with the study topic particularly from participants’ perspectives, and uses descriptive analysis of the issues and people involved (Clark et al., 2021; Creswell, 2014; Creswell, 2007; Merriam & Tisdell, 2016). The research elements used in this project were selected to achieve the aims and goals of a qualitative approach and reflect Creswell’s (2014) assertion that a research approach should demonstrate alignment between philosophy, research design, and research methods³.

³ Creswell (2014, p.5) includes the research question(s), collection and analysis of data, interpretation of findings and validity of results under the term “research methods”.

1.11 Pragmatic Research Philosophy

Pragmatism is the worldview that best describes my perspective towards research and is the philosophical position taken in this project. According to Cherryholmes (1992), pragmatism, as a research tradition, dates to the early 20th century and is primarily focused on outcomes of research in terms of what the practical consequences of research might be. Creswell (2014, p.11) summarizes key tenets of pragmatism, including: pragmatic researchers don't conform to a singular philosophical belief system or view of reality, elements of the research design are chosen based on what strategy best achieves the aims of the research, intended outcomes determine what should be researched and how, research occurs within societal contexts (e.g., social, political, cultural, etc.), and ultimately, that "pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis." Vogt et al. (2012, p.105) further describe pragmatic research as "practical and useful, but not necessarily straightforward", with the expectation that pragmatists "...be willing to use whatever methods are logical and useful, even if that means combining research designs in new ways." Although pragmatism represents a notable departure from what Clark et al. (2021, p.564) refer to as "embedded methods" (the belief that the worldview used in any given research should dictate specific types of research designs, and vice versa), it also allows for greater innovation and flexibility in research.

Pragmatism guided the development and implementation of the project design which focused on gaining insight into the kinds of conservation practices in which hunters in Canada are most likely to engage. Understanding of hunters in Canada, as a group, is not well reflected in academic literature (see Chapter 2). Therefore, some of the underlying questions central to this research included: who are hunters in Canada, where do they live (both geographically and by residence type), what do they think about conservation, in what ways might they participate in conservation and, does the form of conservation they engage in vary based on geographic region, age, gender, political leaning, or the kind(s) of hunting they do? Given the type of information I was interested in collecting, it made sense to pose these questions to hunters directly, since they are arguably the best sources for insight into what they think, what they do, and why.

1.12 Survey Research Design

I used a survey design as my system of inquiry because of its strength in describing characteristics of individuals within a group (Clark et al., 2021; Merriam & Tisdall, 2016, p.5; Ruel et al., 2016), and because it allowed for simultaneous engagement with a large number of participants across the country. Selection of specific elements of the design was informed by practical considerations that will be noted where relevant in the discussion of each design element.

I used a cross-sectional survey design to gather information about conservation actions and opinions from hunters in Canada. A cross-sectional research design collects data at a distinct point in time from a sample of a group (Clark et al., 2021, p.50; Creswell, 2014, p. 157; Ruel et al., 2016, p.7; Vogt et al., 2012, p.339) and commonly uses survey methods such as questionnaires or interviews to gather information (Clark et al., 2021, p.50).

1.12.1 *Survey as a Qualitative Tool*

Survey designs that use questionnaires to collect data are often associated with a quantitative approach (e.g., Creswell, 2014; Dillman et al., 2014) particularly in ‘human dimensions of conservation’ (e.g., Newing, 2011, p.8; Vaske, 2008). Questionnaires often use closed-ended questions drawn from a probability sample that allows for results to be analyzed using statistical methods and thus generalizes results to the greater population (Cresswell, 2014, p.18, Dillman et al., 2014). There is precedent for using cross-sectional surveys in qualitative research, though participant interviews⁴ are typically employed as the means of data collection because interviews tend to be associated more often with qualitative frameworks that seek to gain a depth, or ‘quality’ of understanding about the research topic or group being studied (Clark et al., 2021, pp.53 – 54).

However, Clark et al. (2021, pp.565 – 567) also note that adherence to a strict dichotomy between quantitative and qualitative designs may not be practical or realistic in all instances and use the example of including open text responses in a survey that otherwise has closed-ended response

⁴ My initial project design included semi-structured interviews in addition to the questionnaire with the intention of providing additional depth to the topic. I conducted 11 interviews between October 2023 and February 2024. Given the large volume of surveys completed, my graduate committee agreed that the interview data be addressed in future studies.

options. Braun et al. (2021) endorse using survey questionnaires as a qualitative tool in research to provide a wide view of a phenomenon and assert they can provide depth of understanding particularly when a population is not well studied or is large. Mazzola et al. (2011) and Trott & Reeves (2018) collected both qualitative and quantitative data in their respective exploratory survey research projects that sought to avoid limiting respondents' answers by only offering pre-conceived fixed responses, thus they incorporated options for open-ended text responses.

I used a cross-sectional survey as a way to engage with thousands of hunters in different parts of Canada, and, as Vaske (2008, p.3) notes about surveys, to facilitate research that is exploratory, descriptive, and has multiple goals. I wanted to explore current actions and opinions pertaining to conservation from as many hunters throughout Canada as possible, describe the characteristics of hunters who responded, and ultimately gain a better understanding of the relationship between hunters and conservation.

1.12.2 Minimizing Response Bias

While it's typical for surveys regarding conservation to use self-reported behaviours, there are concerns about the role of bias in responses (Rosa & Collado, 2019). Response bias such as social desirability is introduced into surveys when participants adjust their answers to questions based on socially acceptable norms, thus overreporting answers perceived to be acceptable, and underreporting answers perceived to be unacceptable to society (Ruel et al., 2016, p.54), or to an interviewer (Vaske, 2008, p.127). Ensuring respondents remain anonymous and framing the research questions and objectives in a non-judgemental way helps to reduce bias in responses (Nilsson et al., 2020), as is using a delivery mode such as internet surveys that do not have the researcher present (Ruel et al., 2016, p.54; Vaske, 2008, p.126). These measures were employed in my survey design.

1.12.3 Survey Administration: Online Self-Completion Questionnaire

The format of the survey questions and engagement methods used with participants are typically referred to as the survey 'administration' or 'mode' (Creswell, 2014; Dillman et al., 2014). Survey questions can be administered to participants either through conducting structured interviews or by using a self-completion questionnaire, the latter of which can be either supervised or unsupervised by the researcher (Clark et al., 2021, p.166). I opted to use an unsupervised self-completion questionnaire

that was available in an online format for several reasons. The rationale for making the survey available online was to facilitate participation from a high number of people in a relatively short period of time without being tied to a specific location (Vaske, 2008). Several other advantages in using a self-administered questionnaire include: consistency in the questions and user interface is assured across the sample, the cost of delivery per respondent is low, a relatively low effort is needed in order to get a large sample, it's relatively easy to administer to groups of participants, and finally, the amount of time required of participants to complete the survey is low (Vogt et al., 2012, p.20). For the purpose of this thesis, the terms "survey" and "questionnaire" will be used interchangeably.

Some scholars specializing in survey research (e.g., Dillman et al., 2014; Ruel et al., 2016; Vaske, 2008) have acknowledged that advances in technology have made online surveys easier, though they have also raised concerns about the accessibility of internet services across a population and ability of respondents to use the survey software. Access to an online survey can be impacted by what is referred to as the "digital divide", where not all members of a population have equitable access to Information and Communication Technology (ICT) including internet, a reliable internet connection, hardware devices (e.g. computers, smartphones, tablets), software such as data or program subscriptions, or the ability to navigate an online survey (Lythreatis et al., 2022; van Deursen & van Dijk, 2019). It may have been less of a problem if potential participants were from the general trend of web technology and thus general fluency of technology improves with technological advances (Fang et al., 2019; Lythreatis et al., 2022). My response rate was quite large, so this may indeed have been less of a barrier, but I still acknowledge that there is inequality in access, and this can constrain the diversity of respondents. This is a common struggle with a complex range of determining factors, and no clear solutions yet exist (Fang et al., 2019; Lythreatis et al., 2022)

Another challenge with questionnaires that are self-administered is that the researcher is not present to provide clarity or explanation about any of the questions. I addressed this concern by including my contact email and link to the survey website both at the beginning and the end of the survey so respondents could contact me directly with questions or check the website for further information. The website included a page for Frequently Asked Questions (FAQs) and a contact form that delivered survey-specific questions to a dedicated email folder that was run solely by me.

1.12.4 Survey Instrument: Qualtrics

The specific tool used to collect survey data is referred to as the survey instrument (Creswell, 2014). I used Qualtrics software (Qualtrics, 2023), an online survey tool licensed by the University of Waterloo, to create and administer the questionnaire. There was no additional cost to use this software, and the license included access to Qualtrics-specific technical support. The survey was accessible by either a survey link or Quick Response (QR) code generated by Qualtrics and embedded in email or social media communication. Because the link was anonymous and not tied to individual emails or email distribution lists, it was easy for recipients to share the link within their personal networks if they wished. No incentives were offered in return for participating in, or sharing, the survey, and survey settings to prevent multiple submissions and detect bots were enabled.

Qualtrics offers several features that enabled the survey questionnaire to be tailored to the project. The banner at the top of each survey page was customized with the University of Waterloo Faculty of Environment logo and text. Forward and backward arrow buttons were added to the bottom of each page to allow for easy navigation and review of responses. I selected green for the background colour of the banner, and orange for the navigation buttons. The body of the questionnaire used a white background with black font. The default language was English, though users could select either 'English' or 'French' from a dropdown menu located on the top right of each page. A progress bar at the bottom of the page helped users track their progress in real time.

1.12.5 Survey Information and Consent

The first page of the survey, titled "Information Letter", provided information and context about the study, contact information for both my thesis adviser and for me, and an invitation to participate in a master's level research study. The option to download a PDF file of the information letter was included at the bottom of the page. The Information Letter can be found in Appendix A, or by clicking [HERE](#).

Two pre-survey permission questions for which responses were required followed the information letter. The second page of the survey, titled "Informed Consent", provided a statement of informed consent for which respondents were given the choice to either agree or disagree prior to participation in the study. Respondents had the option of using the 'back' button to review the information letter if needed, though could not navigate forward unless a response was selected. Respondents who selected

the “agree” button were taken to the next permission page, while those who selected the “do not agree” option were automatically moved forward to the end of the survey.

The third page had the final pre-survey permission question, which was a request to use anonymous quotations from any text responses. Respondents were required to answer ‘yes’ or ‘no’ before moving to the beginning of the questionnaire, though neither choice had any bearing on survey or survey question availability.

1.12.6 Questionnaire

The development of survey questions was an iterative process informed by peer-reviewed literature, grey literature, and my personal experience of being both a conservationist and a hunter actively engaged in hunting and conservation communities over several years and in different parts of the country. Other than the initial required permissions, all responses were optional. Participants had a choice of selecting “prefer not to answer”, or to simply skip any of the questions.

The survey, which can be accessed [HERE](#), consisted of 26 questions designed to collect categorical data. Questions 1 – 25 were grouped into three thematic blocks in the back end of the survey: demographic and related contextual questions (Nos. 1-13), conservation behaviours (Nos. 14 - 19), and opinions about hunting and conservation (Nos. 20 – 25). Question formats were presented as either closed-ended multiple choice questions, or matrix table questions, and had a mix of answer options: 1) select only one answer, 2) select all that apply, 3) select up to three choices, 4) select one answer based on a scale, and 5) enter a text response. Several multiple-choice questions (n=9) included an option for “other: please specify” along with space for a short answer text response to be added in the event respondents wished to add an answer option in their own words. Adding the option for participants to specify their own answer follows the rationale reflected by Trott and Reeves (2021), that using only pre-selected answer options may be overly restrictive and may not capture information respondents feel is pertinent to the question. The last question (No. 26) was open ended to allow respondents to add or clarify information about the survey topic if they wished. My graduate thesis committee agreed with my suggestion to omit text entry responses from analyses because of the overwhelming volume of responses. Text responses that added short answers to multiple choice

selections, and responses from question 26 that was entirely open-ended, are planned to be used in future studies.

The survey questions in English have been formatted for ease of reading and are at the end of this document. Please [CLICK HERE](#) to go to the survey questions in this document. The French version of the survey can be found [HERE on Google Drive](#).

1.12.7 Translation

Since Canada is a nation that recognizes both English and French as official languages, I wanted to be equitable in making the survey available in both official languages. The survey, including the information letter, was written, and revised in English. Once the English materials were finalized, they were translated into French. The initial translation was done using the Google Translate feature in Qualtrics and then corrected and verified by two bilingual professionals, one of whom is Québécois. There was no cost associated with the translation.

1.12.8 Website

As part of a strategy to manage workflow, I created a survey website www.targetingconservation.com. Along with the survey link and QR code, the website included text from the Survey Information Letter, a downloadable PDF of the letter in both official languages, a FAQs page of what I suspected would be common questions, a page where results will be shared, and a 'Contact' form. Submission of the contact form was directed to my @uwaterloo.ca email address, and any questions or comments entered in via the website were directed to a 'Survey Questions' folder in my email inbox.

1.12.9 Review & Testing

Both the survey and the associated website were reviewed and tested before actively being shared with the public. Multiple reviews of survey questions took place at different stages from a range of people. Reviewers included SERS faculty with expertise in survey research, social dimensions of conservation, and qualitative research methods, as well as friends and colleagues outside of the academic environment who are both hunters and conservationists. Several volunteers tested the survey prior to research ethics submission to confirm the average survey completion time, overall navigation, and ease of use on different types of devices (computers and smartphones). Questions were reviewed for clarity, relevance to the research topic and question, and appropriateness.

1.12.10 Ethical Approval

Final and minor changes to the survey questions were made based on suggestions from a reviewer at the University of Waterloo Office of Research Ethics <https://uwaterloo.ca/research/office-research-ethics> as part of the project review process. The website was reviewed by my advisory committee as well as friends and colleagues both within and outside of SERS. Approval from the Office of Research Ethics was received on October 10, 2023. The approved Ethics application #44598 can be found in Appendix C [HERE](#). Once Ethics approval was received and the survey and website were published live, a last round of testing was done with three people: one fellow graduate student, one OFAH staff member, and my thesis advisor, to check that embedded links were working as intended.

1.13 Survey Methods

1.13.1 Purposive Sample

A purposive sample of hunters in Canada was selected for survey distribution. A purposive, or judgement sample, is a type of non-probability sampling method where the researcher strategically determines how participants will be selected (Vogt et al., 2012, p.128). This non-random sampling method means that some members of a population have a greater likelihood of being selected to participate over others based on subjective decisions of the researcher, compared to a random probability sample that affords each member of the population a known and equal likelihood of being selected for participation (Creswell, 2014, p.158; Dillman et al., 2014, p.75; Vaske, 2008, p.183; Vogt et al., 2012, p.128). Purposive sampling is used most often in qualitative approaches, survey research, and in instances when using a random sample is not feasible, or when it's not possible to determine the total population from which a sample is being drawn (Clark et al., 2021, p.377; Vogt et al., 2012, p.128).

There are both limitations and strengths associated with this form of sampling. Limitations include the possibility of researcher bias being introduced, the recommendation by some to avoid statistical analysis of results of purposive samples or generalize findings to the population, and the inability to reliably determine sampling errors (Clark et al., 2021; Ruel et al., 2016, p.152; Vaske, 2008, p.183). Purposive sampling can, however, be useful in research that is exploratory, when the sample size is large, or when generalizing to the population is not an aim of the research (Ruel et al., 2016, p.152; Vaske, 2008, p.183).

Additional characteristics that made purposive sampling a good fit for this research, as explained by Clark et al., (2021, p.378), is that the sample is chosen for the express purpose of learning “as much as possible about the phenomenon of interest...with direct reference to the research questions”. From a practical perspective, this form of non-random sampling was chosen because it was the best option given constraints of limited time, money, and capacity in a master’s research project (Vogt et al., 2012, p.128).

1.13.2 Sample Criteria

The sample criteria were predetermined and helped tailor the questionnaire to the target audience and research questions prior to conducting research. Associated with purposive sampling, this *a priori* approach means that sampling criteria are fixed rather than iterative once the survey is active (Clark et al., 2021, pp.378 – 380). This purposeful strategy is often used in qualitative research to align participants with the research context and question (Creswell, 2014:189).

I was interested in surveying hunters in Canada, and used the following inclusion criteria to define the target population:

- People who have hunting experience in a broad sense. This includes people who currently hunt, people who have hunting experience but may not hold a current hunting licence, tag, or permit, and people who have hunted in the past but are not active hunters currently (e.g., due to age, access, health, or other issues).
- People who reside in Canada.
- Practice any form of hunting.

1.13.3 Sample Selection

Hunting is regulated by provincial and territorial jurisdictions in Canada, each with their own respective government ministries that provide management, enforcement, and oversight. Since working through individual government agencies was not feasible, I sourced participants through provincial and territorial non-governmental organizations (NGOs) whose mandates prioritize both hunting and conservation. Membership in these organizations is voluntary, and while the online survey link was shareable, it’s much less likely that hunters who are not members or subscribers to their provincial or territorial hunting-conservation NGO would have been aware of the survey.

1.13.4 Distribution Strategy

The request for expressions of interest, followed by the survey information and recruitment materials, were shared initially with the Ontario Federation of Anglers & Hunters, who then forwarded the information and materials to similarly oriented provincial and territorial organizations across the country. Positioned as “the voice of anglers and hunters”, the OFAH is a non-partisan Ontario ENGO dedicated to sustainable hunting, fishing, evidence-based conservation, and education (www.ofah.org; www.ofahfoundation.org). It’s a large organization with approximately 60 full-time staff, over 70, 000 members and subscribers, and numerous programs that revolve around education, engagement and advocacy for sustainable hunting and fishing, and conservation. The OFAH is a federally registered lobby organization, self-described as a “...common interest conservation association. Goals include the wise use, optimal benefit, and perpetuation of Canada’s renewable natural resources, particularly fish, wildlife, and their habitats.”

(<https://lobbycanada.gc.ca/app/secure/ocl/lrs/do/vwRg?regId=957451&cno=74#regStart>). OFAH is considered a stakeholder by municipal, provincial, and federal governments and provides collaborative expertise through formalized and ad hoc participation in working groups and on committees. OFAH’s directives of “hunt, fish, conserve” and “learn, share, conserve”, as well as their promotion of conservation policies and practices (highlighted on their websites and supported by comments made to the Environmental Registry of Ontario on a range of conservation issues) strongly align with the topic of my thesis.

OFAH was selected as the initial point of contact for several reasons. I reside in and have the greatest lived experience with hunting and conservation in Ontario. I currently serve as a volunteer on the OFAH Foundation Board of Directors and am thus acquainted with organizational leadership. Their organizational capacity and membership size offered a potentially wide reach for survey distribution. As an affiliate member of the Canadian Wildlife Federation (CWF), OFAH has working relationships and communication with other CWF-affiliated NGOs that have similar mandates of sustainable hunting, fishing, and conservation, and were interested in sharing the survey information with appropriate people in those respective organizations.

The Canadian Wildlife Federation is a non-partisan federal environmental NGO that promotes collaborative, science-based approaches to wildlife and habitat conservation in Canada (<https://cwf->

fcf.org) and is an organizational member of the International Union for the Conservation of Nature ([IUCN](http://iucn.org)). While the CWF does not advocate for hunting, its mandate supports a wide range of sustainable nature-based activities that connect Canadians to nature. Provincial and territorial hunting-conservation organizations have representation through elected individuals on the CWF Board of Directors as Affiliate Directors. Engaging CWF affiliate organizations was chosen in hopes of reaching hunters in Canada that may also have insight about, and experience with, conservation, and increased the likelihood that the survey would be widely distributed within a reasonable time.

Through OFAH, the survey information was shared on my behalf with leadership of provincial and territorial non-government hunting and conservation organizations in Canada that are affiliate members of the CWF. Subsequent communications from organizations that opted to share the survey with their respective memberships were directed to me as the student researcher. The University of Waterloo Office of Research Ethics-approved text templates for distributing the survey through email, newsletter, and social media posts were included as part of the recruitment materials to ensure consistency in communication and reduce barriers to participation by minimizing the administrative burden often faced by non-profit organizations, particularly those that are smaller and have less staff capacity.

1.13.5 Survey Availability

The survey was publicly available between October 16 and November 27, 2023. Based on consultations with leadership from interested organizations, it was clear that the survey information would be shared with potential participants between Oct 16 and Nov 15. The survey availability dates were chosen to ensure that organizations who opted to participate had sufficient time to distribute the survey link through a medium of their choosing, and that members in these respective organizations would have access to the survey for a minimum of two weeks.

1.13.6 A Priori Sample Goals

My initial goal was to reach at least 60, 000 hunters in Canada through emails to members of hunting-conservation organizations, and to receive at least 3, 000 responses, or approximately 5% of the total approximate reach. Of the 13 CWF affiliate organizations, 6 confirmed an interest in participating in the survey project. These organizations were representative of the Yukon Territory and provinces of British

Columbia, Alberta, Saskatchewan, Manitoba, and Ontario. The sample goal was a conservative estimate based on the approximate combined number of members in those organizations that would receive an invitation to participate in the survey. Participating provincial and territorial hunting-conservation organizations were asked to use recruitment text that had received approval from the University of Waterloo Research Ethics Board when sharing the survey link with their membership through email, newsletters, and social media platforms.

1.13.7 Survey Responses

Both the approximate reach and the total number of responses exceeded my goals, with approximately 118, 000 hunters reached, and 4570 survey responses received. The table below summarizes the formats in which the survey link was shared, and the respective approximate number of people each type of distribution reached by each organization that opted to share the link. Since the survey was anonymous and I did not have access to email or membership lists, the estimated number of people reached was provided by each organization respectively, based on the number of subscribers to their emails lists and approximate reaches if the survey information was posted to their social media. The organizations listed in the table are those from which I received confirmation of distribution. Given that I received responses from across Canada, it's likely that other CWF-affiliated organizations distributed and/or shared the survey link, and that some individuals shared the link within their own networks that may have included hunters who are not currently members or subscribers of a provincial or territorial hunting-conservation organization.

Table 3

Survey Distribution according to organization, distribution type, and approximate reach⁵

Organization	Type(s) of Distribution	Approximate Reach*
Alberta Wildlife Federation	e-newsletter, social media	24,000
B.C. Wildlife Federation	e-newsletter, social media	28,000
Manitoba Wildlife Federation	e-newsletter	10,000
Ontario Federation of Anglers & Hunters	direct email (one initial, one reminder), social media	60,000
Saskatchewan Wildlife Federation	e-newsletter, website, social media	15,000
Yukon Fish & Game Association	direct email	1,000
Total approximate reach (individuals)		118, 000

**Note: the approximate number of hunters reached reflects the combination of distribution methods with estimates provided by respective organizations.*

1.14 Analysis

The process of preparing data, including specific steps taken in validating responses to ensure analysis was conducted using reliable information, are outlined. A brief definition of descriptive analysis and its application for this research are provided at the end of the chapter.

1.14.1 Data Preparation

The total number of recorded responses in Qualtrics was 4570. I performed several sequential steps of reviewing, verifying, and filtering the raw data within Qualtrics to confirm the validity of responses in preparation for analysis. Cleaning the data resulted in removal of a total of 548 invalid responses, leaving 4022 valid responses from which to work. This cleaning of data is consistent with best practices in management of survey data to determine valid responses that will be reduced into tables and

⁵ Links to each organization's website are included in the references.

graphs, and upon which description and discussion of findings rely (Clark et al., 2021, p.12; Creswell, 2014, pp.196 - 207; Ruel et al., 2016, pp.208 - 209).

1.14.2 Ensuring Qualitative Validity in Data

Using multiple strategies to ensure the collected data are accurate helps demonstrate validity in qualitative research (Creswell, 2014, p.201). I implemented two validation strategies during the survey and survey tool development stage: I incorporated questions into the survey to help in the response verification process and had enabled security features available in Qualtrics that would identify responses likely to be bots. These strategies were completed prior to the survey being launched, so all responses were treated consistently. The post-survey measure I used was to remove surveys that had only demographic information completed. These combined strategies helped ensure validity in the data and thus greater accuracy in the results.

1.14.3 Process to Remove Invalid Responses

I selected settings in Qualtrics to record and save all responses. Qualtrics software has built-in capabilities of filtering data based on a wide selection of criteria (e.g., percent completed, response type, question number, likely bot responses, likely duplicate responses), and generating graphs, tables, and cross-tabulations based on the dataset. Since I wanted the option of using some of the Qualtrics features to examine data and generate graphs, I needed to first remove invalid responses from the software, which required deletion from Qualtrics.

Before removing any survey responses, I exported the entire full dataset of 4570 responses to Excel. As I went through the validation process, I filtered the responses I wanted to remove, reviewed them to ensure the criteria matched what I intended to remove, and exported them as .CSV and Excel files before deleting from Qualtrics. This ensured I have a fully intact original dataset, and spreadsheets of each category of raw data that was removed.

1.14.4 Sequential Steps in Cleaning Data

Data cleaning began several weeks after the survey was closed and responses in progress could no longer be submitted.⁶ The order in which invalid responses were removed was intended to increasingly refine the recorded responses at each step for increased accuracy. A summary of the sequence of steps that were taken in cleaning data, including the corresponding number of responses removed per step, are presented in Table 4, and are described in detail below:

1.14.4.1 Capturing data prior to cleaning

The entire raw dataset of 4570 responses was exported as .CSV and Excel files before any categories of recorded responses were identified as invalid and removed.

1.14.4.2 Responses identified as bots by Qualtrics

During the survey creation process, I enabled several security features offered by Qualtrics (Qualtrics.com). These included anonymizing responses so that the IP addresses, location data and contact information were not recorded, as per the survey information letter and in accordance with the approved Ethics protocol. There were also measures taken to reduce and prevent fraudulent submissions, such as ensuring security scanners didn't begin the survey as part of the scanning process to test the survey link, preventing multiple submissions from the same IP address, detecting and flagging likely duplicate responses, and detecting and flagging responses likely from bots.

I filtered for responses that were likely bots, which resulted in 94 responses. These were exported and then deleted from Qualtrics.

1.14.4.3 Not agreeing with Informed Consent

Respondents that selected "I do not agree to participate in this study" were taken by skip logic to the end of the survey. However, their survey still appeared as a recorded response. I filtered these responses in Qualtrics, reviewed them to ensure there were indeed blank surveys, exported the file, and deleted these 52 responses from Qualtrics.

⁶ I had established survey settings to allow respondents 1 week to complete the survey from the day they started, so responses could theoretically have been received up to 7 days after the survey link closed.

1.14.4.4 Responses with only demographic information

The primary reason for conducting the survey was to gather information from hunters about conservation. Some survey respondents completed only the demographic information, which was not key information needed from my survey. After filtering and carefully reviewing these 354 responses where the conservation portion of the surveys were entirely or mostly incomplete, I exported the file and deleted these responses from Qualtrics.

1.14.4.5 Responding 'no' to being a current or past hunter

Any respondents who selected 'no' to question 9 "Are you currently a hunter, or have you hunted in the past" were removed from the analysis. In removing these 48 responses, it's possible I lost some youth or other people who have accompanied hunters as observers but don't yet have a hunting license, though these participants would have had limited hunting experience in any case.

1.14.5 Flagged Responses Not Removed

I did not remove 62 survey responses that were flagged by Qualtrics as likely duplicates for two reasons. First, if any respondents didn't complete their survey within one week and opted to restart it from the same IP address, it would have been flagged by Qualtrics as a duplicate. Second, in households where multiple hunters reside and family members share devices, multiple responses, even when the answers differ, would have been flagged as duplicates by Qualtrics because they would have originated from the same IP address.

Table 4

Summary of Steps Taken to Remove Invalid Responses Presented in Sequential Order

Sequential Steps in Data Cleaning	Removed (N)	Remaining (N)
1. Total recorded responses exported prior to validation	0	= 4570
2. Flagged by Qualtrics 'Expert Review' as likely bots	-94	= 4476
3. Selected "Disagree" to Informed Consent	-52	= 4424
4. Only completed demographic portion of survey	-354	= 4070
5. Responded 'no' to being a current or past hunter	-48	= 4022
Summary		
Total responses removed from analysis:	-548	
Total number of valid responses:		4022

1.15 Descriptive Analysis

Descriptive analysis aligns with all elements of the exploratory, qualitative research design I used for the purpose of describing the perceptions, behaviours, opinions, and feelings of hunters in Canada that were reported in the survey. Because the survey responses were already organized into categories based on question number, I exported the data according to survey question response from Qualtrics to Excel, and then created tables and graphs directly from the responses since there was no need to recode or recategorize the results. The figures were created to display the number of responses to each question or question option in a visually succinct format as part of the descriptive analysis.

Chapter 4

Results

My research intended to explore hunter perceptions about, and participation in, conservation with the aim to improve understanding about the relationship between hunters and conservation. Gaining a more robust understanding about hunters in Canada⁷ by hearing from hunters directly was central to informing this understanding. A range of information was collected through an anonymous online survey during the Fall of 2023. The survey was, in principle, loosely segmented into three categories: demographics, behaviours, and perceptions (called ‘opinions’ on the back end of the survey).

Demographic questions provided information about gender, age, political affiliation, residence location and type, Indigenous identity, and cultural heritage, which offers a more well-rounded picture of the hunters who completed the survey. Behaviour questions were intended to gather information about what hunters do in terms of hunting preferences, conservation activities, and participation in other forms of outdoor recreation. Lastly, perception questions revolved around thoughts and feelings hunters have about nature and conservation, their degree of openness to participating in wider conservation efforts outside of their immediate social circle, how they feel they are viewed by non-hunting conservationists, and the extent to which they think they are included in conservation decision-making.

A total of 4022 valid survey responses were used as the working sample. The results presented in the following figures and tables specify the number of total responses either per single topic question or per response category. Single topic questions allowed for both single-choice (only 1 choice permitted) and multiple-choice answers (e.g., choice of top 3 answers or “check all that apply”) per question.

⁷ To reiterate from Chapter 3, the non-probability sample for the survey was primarily completed by hunters who are members or subscribers of provincial and territorial hunting-conservation organizations. These findings can’t be reliably generalized to all hunters in Canada due to the sampling method, however the large number of responses make the findings notable.

Matrix tables were used to ask a general question (e.g., “how often do you participate in...”) applicable to multiple statements for which participants selected a scaled response. Scaled responses per statement were mutually exclusive, though not all statements per question required a response. In cases where the number of responses to questions within a matrix table varied, the number of responses per statement are specified.

Selection of “other” allowed respondents to add a limited amount of text in their own words, though the content of text responses will not be described or discussed in this thesis. Selection of “N/A” did not allow text to be added, and thus functioned as a closed-ended non-response. The number of responses associated with “other” or “N/A” may not be included in all tables or figures but are acknowledged in the explanation of results.

Results by question are presented in the same order of thematic groupings as they appeared in the survey: demographics, behavioural questions, and perception questions. Other than the map used to illustrate the number of responses per jurisdiction, all figures and tables include both the number of responses per choice, category, or selection, and the percentage of total responses per answer or statement.

1.16 Demographic Information

Demographic information was included to provide insight about hunters in Canada. Demographic information helps provide context about the ages, genders, geographic locations, residence types, political and organizational affiliations, and cultural backgrounds of hunters who responded to the survey. Except for questions pertaining to cultural background and heritage, which allowed for multiple choices to be selected, all demographic questions were single-choice questions and the results per category are mutually exclusive.

1.16.1 Gender

94% of respondents were male and only 6% were female. All 4022 respondents answered the question on gender with 3989 selecting either male or female as their response (Figure 1). Of the remaining 33 respondents not included in the chart, 10 selected “prefer to self-identify” and 23 selected “not applicable”. The answer option “two-spirit” was not selected by any respondents.

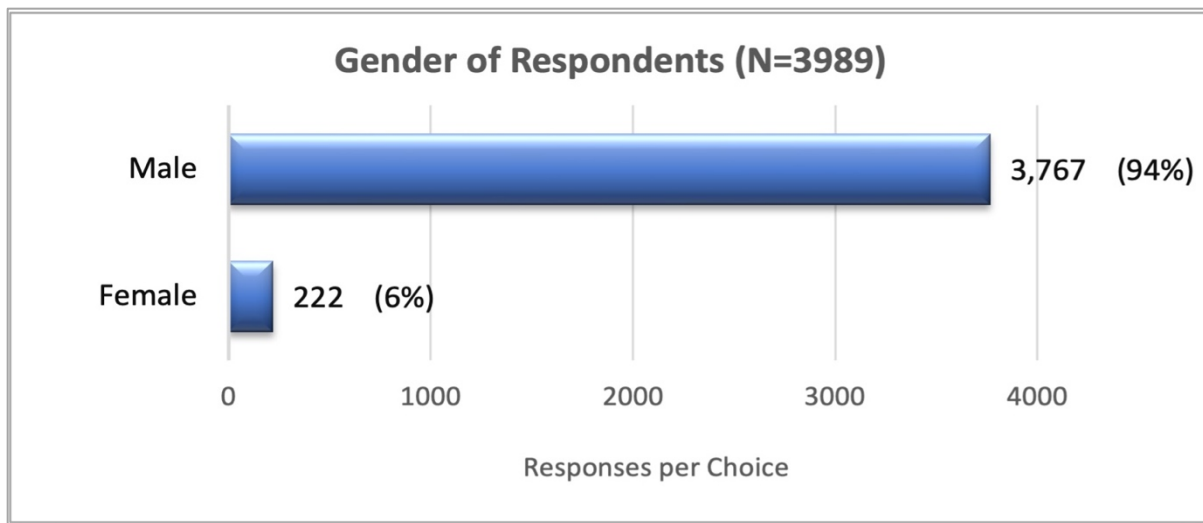


Figure 1: Gender of respondents

1.16.2 Age

Only 13 of the 4022 respondents opted not to select an age category, answering “N/A”. Figure 2 displays the age categories as they were presented in the survey. The categories 46 – 65 and over 65 years of age reflect that most respondents (79%) were over the age of 46 at the time of the survey.

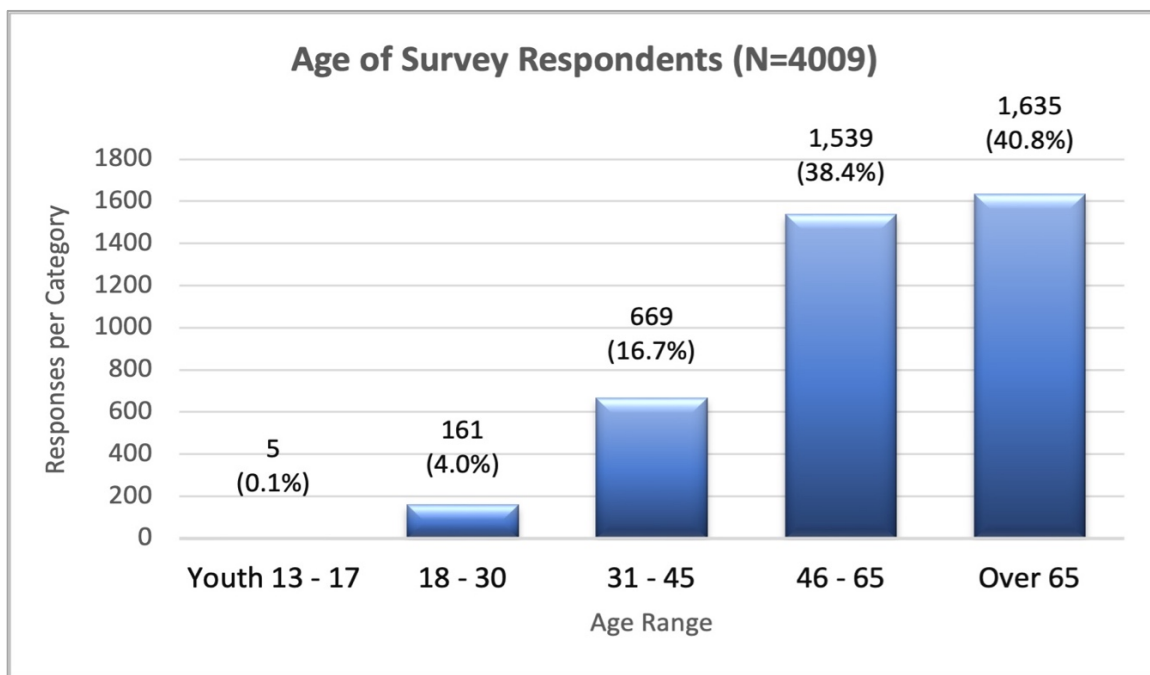


Figure 2: Age range of respondents per age category

1.16.3 Political Affiliation

The question on tendency of political affiliation or voting selection offered political party affiliation as answer options, though did not specify federal or provincial/territorial jurisdiction. 60% of respondents chose Conservative as their political affiliation or voting tendency. Collectively, just over 24% of respondents selected non-partisan or not applicable. The remaining 16% of respondents chose either “other”, or one of the other political parties listed. Skip logic in Qualtrics was used for respondents who selected “Youth” as their age range to automatically skip the question of political affiliation. A breakdown of the number of respondents per category is illustrated in Figure 3.

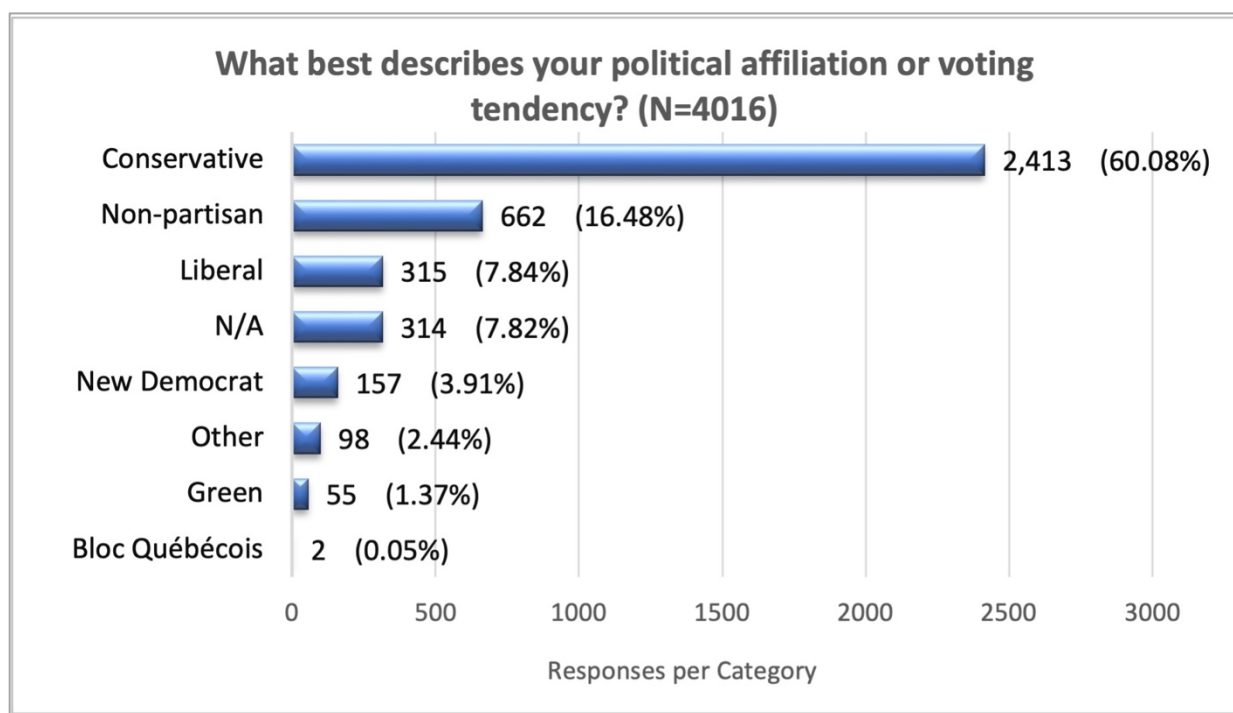


Figure 3: Political affiliation or voting tendencies selected by respondents according to political party

1.16.4 Province or Territory of Residence

Respondents were asked to select their province or territory of residence. 3,964 (95.6%) of the 4022 survey participants opted to answer this question. The map of Canada (Figure 4) identifies the number of respondents from each province and territory respectively. Darker coloured jurisdictions correspond to a higher number of responses, which is most noticeable for Ontario given the highest number of responses were received from that province. The high response rate from Ontario is likely due to the

OFAH being the only provincial/territorial organization that confirmed sending two dedicated emails through their email list about this survey specifically, in addition to sharing the survey link on their social media platforms (Table 3). The highest number of survey response submissions per day, according to Qualtrics, correlate to the days that OFAH sent emails to their membership.

Table 5 presents both the number and percent of responses in each jurisdiction using the two-letter Canadian postal abbreviations for each province and territory. At least one response from every province and territory was received, with the majority (83%) identifying Ontario as their province of residents.

Table 5

Responses by provincial and territorial jurisdiction as number of responses (Nr), percentage of question responses (%Q), and percentage of total sample (%S).

	Responses by Province or Territory												
Jurisdiction	YT	NT	NU	BC	AB	SK	MB	ON	QC	NL	NB	PEI	NS
Nr	100	3	1	206	111	80	139	3271	12	3	19	11	8
%Q	2.5%	0.08%	0.03%	5%	2.8%	2%	3.5%	83%	0.3%	0.08%	0.5%	0.3%	0.2%
%S	2.5%	0.07%	0.02%	5%	2.8%	2%	3.5%	81%	0.3%	0.07%	0.5%	0.3%	0.2%

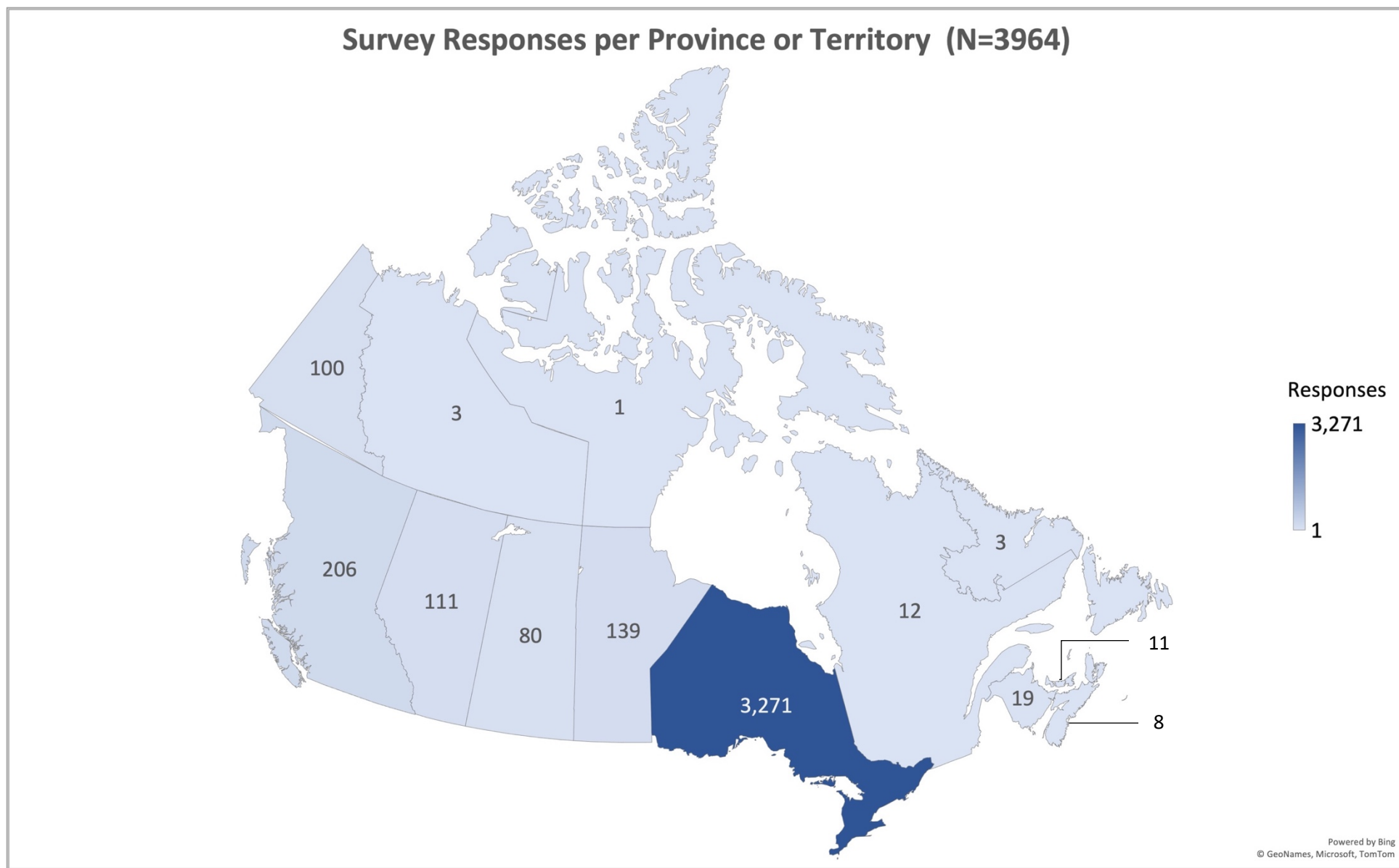


Figure 4: Map of responses from across Canada indicating number of responses received from each province and territory

1.16.5 Residence Locale

Options for residence location were identified as Urban, Suburban, Rural and Remote. 4020 participants answered this question. 99% of respondents identified either rural (41%), suburban (35%) or urban (23%) as their type of residence location, with only 1% selecting remote (Figure 5). An explanation for each type of location was included to provide clarity and reduce subjectivity. The number and percentage of respondents by location, as well as the corresponding descriptions, are summarized in Table 6.

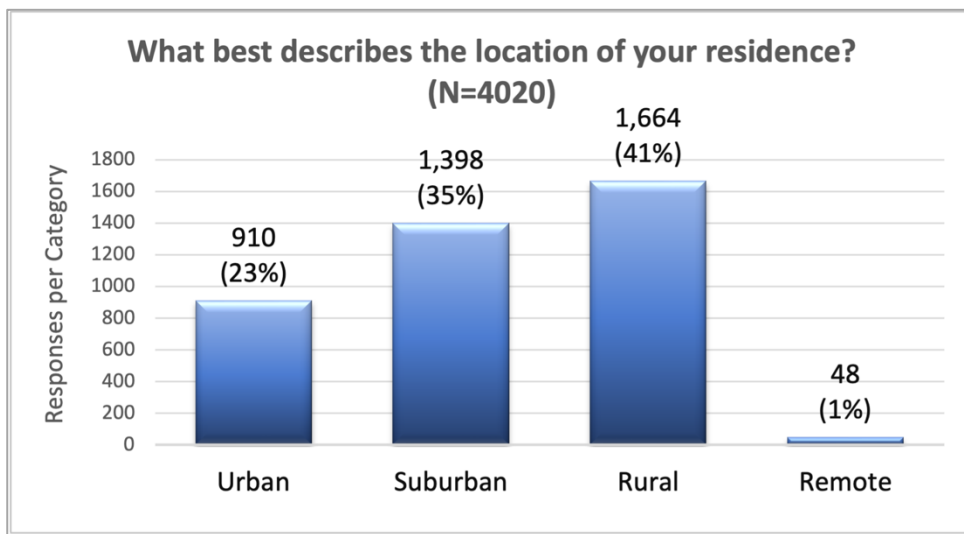


Figure 5: Residence location based on categories of urban, suburban, rural, remote

Table 6

Description of residence location categories that appeared on the survey (N=4020)

Location	Description on Survey	No. of Responses
Urban	Large city, population of over 100,000 people, abundant services and amenities.	910 (22.6%)
Suburban	Primarily residential municipality, less than 100,000 people, within reasonable commute to large city.	1398 (35%)
Rural	Rural postal code, has limited services, not within reasonable commuting distance to large city.	1664 (41.4%)
Remote	Rural postal code, has limited to few or no services, access by air, water, ice road or remote gravel road.	48 (1%)

1.16.6 Indigenous Identity

In their review of the survey protocol, the University of Waterloo Research Ethics Board required two demographic questions that specifically addressed Indigenous identity. The first was a ‘yes’ or ‘no’ response to identifying as an Indigenous person (specified as First Nation, Inuit, or Metis). Skip logic was used to bypass the subsequent question for participants who answered ‘no’ to identifying as Indigenous. Participants who responded ‘yes’ were asked to further identify as: First Nation – status, First Nation – non-status, Inuit/Inuk, Métis, or ‘prefer not to answer’, and select all that were applicable. Neither of these questions were required, and it was therefore possible for survey participants to skip the first question and answer the second question on Indigenous identity, and vice versa. 4017 participants answered the first question, with 140 (3.5%) selecting ‘yes’ and the remaining 3877 participants answering ‘no’ to identifying as Indigenous. 143 participants answered the second question that further specified identity (Figure 6); 3 more than the number of respondents who answered the initial yes/no question. The majority of respondents (63%) selected Métis as their identity.

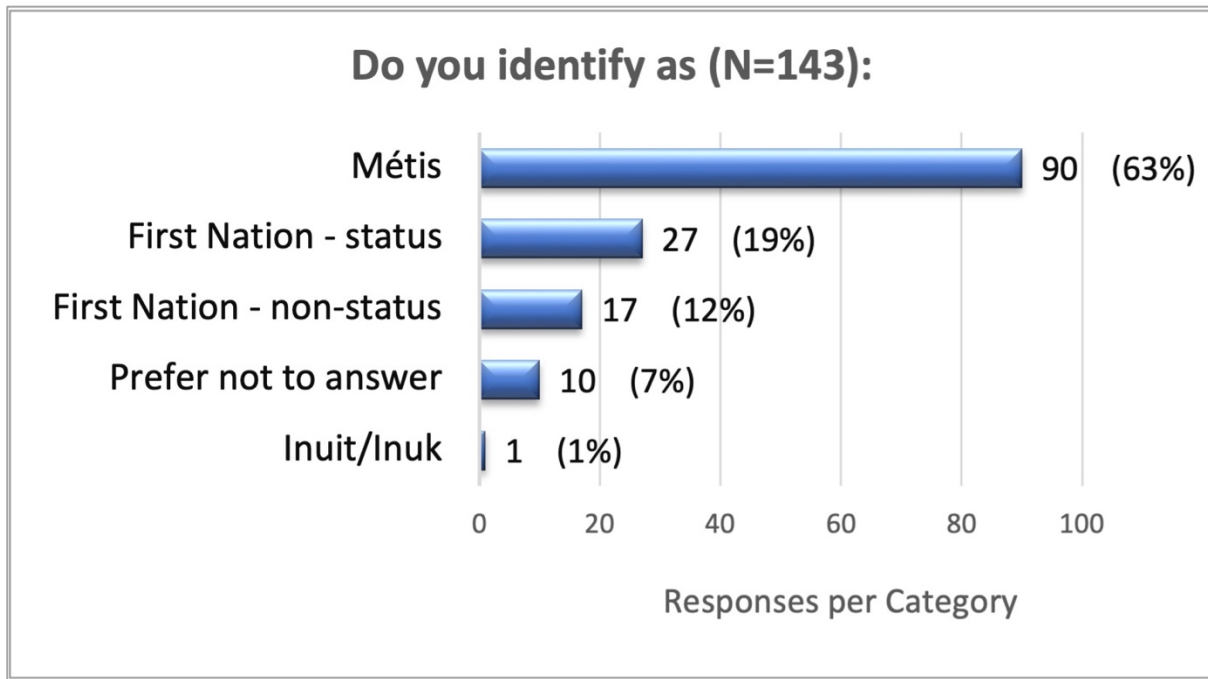


Figure 6: Number of respondents who identified as Indigenous

1.16.7 Cultural Background or Heritage

All 4022 participants chose to provide their cultural background or heritage. I wanted to capture the conventional cultures and heritages in Canada, with the understanding that Canada, aside from Indigenous peoples whose ancestry on this land extends beyond memory or written record, is a nation of immigrants, descendants of immigrants, and varying mixtures of these groups of people. I included response categories of Canadian, First Nation, Inuit, Métis, and Québécois, and to minimize the number of response options, offered additional response categories primarily based on global continental geography. Participants could select all applicable answers with no limit on the number of selections. Including 'other' and 'N/A', there were a total of 5041 responses given across 16 response categories, indicating some respondents selected multiple categories.

Figure 7 illustrates the number of responses per category. 87% of participants identified 'Canadian' as their cultural background followed by western European/UK with 19% of responses and eastern/northern European with over 7% responses. The balance of cultural backgrounds was selected by between 1 and 113 individuals.

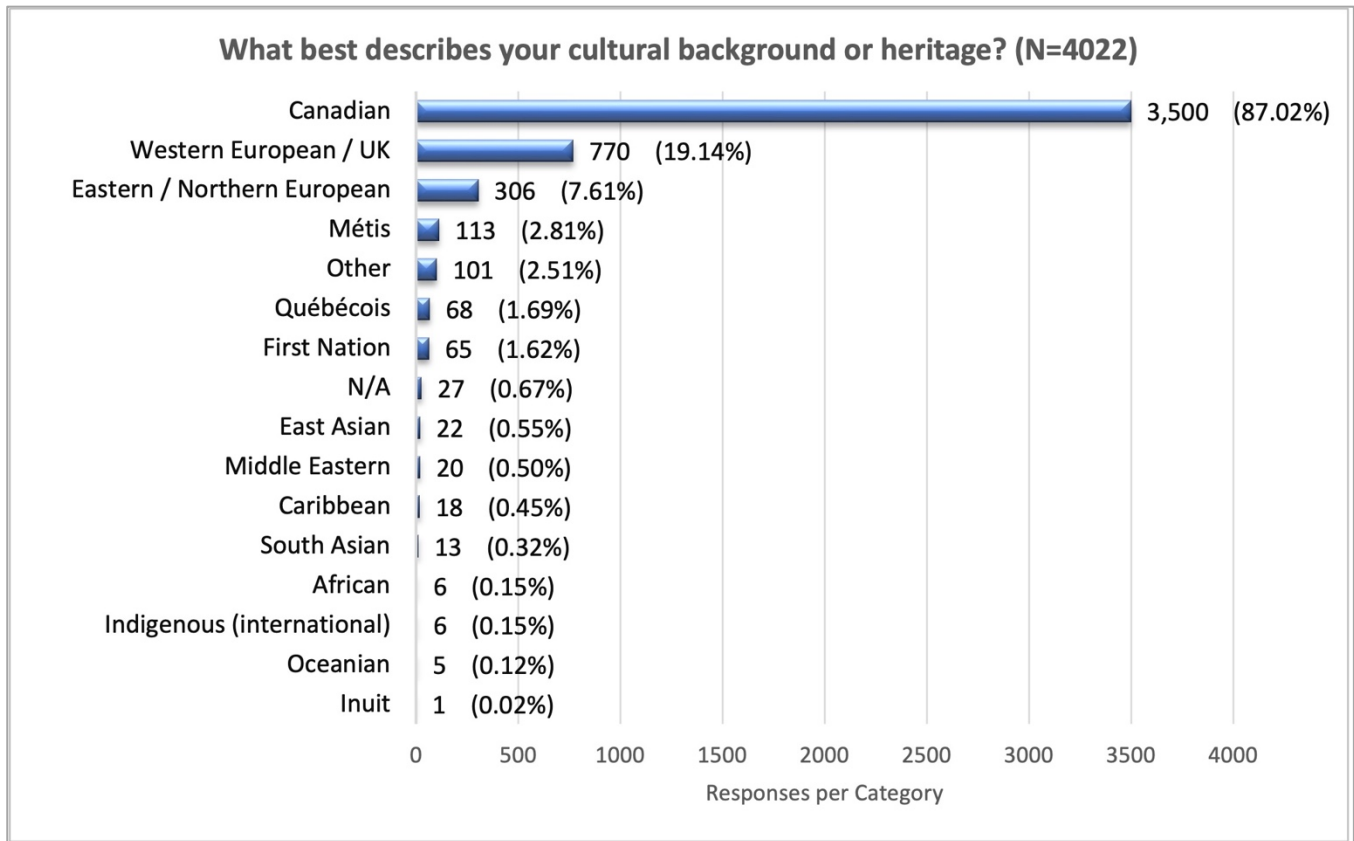


Figure 7: Cultural background or heritage of respondents

1.17 Behaviours

The survey section on behaviours focused on the types of hunting and conservation activities in which hunters engage. Most questions allowed for multiple answers, including “other” with the option of adding an answer choice that was not already listed. One matrix table question about conservation activities was included, with single-choice answer options on frequency of participation offered using a 5-point Likert scale.

The first question in this section asked participants if they are currently hunters, or if they had hunted in the past. Response options were either ‘yes’ or ‘no’. This question was used to confirm valid responses, since the survey was intended for hunters. All respondents who answered ‘no’ to this question were removed from analysis and results. Several follow-up questions about if friends or family of respondents also hunted, and about their sense of identity as hunters and conservationists, are included in the beginning of this section.

1.17.1 Association with Other Hunters

Only 56 of the 4016 respondents do not have friends, family, or acquaintances that hunt compared to the remaining majority of 3,960 who do (Figure 8).

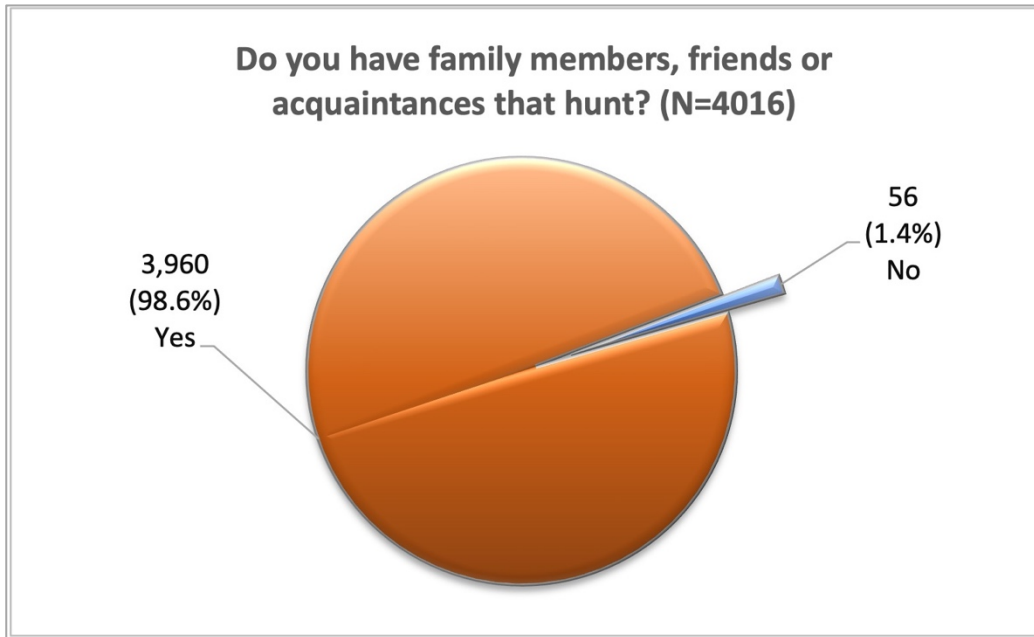


Figure 8: Number of hunters who have friends, family members or acquaintances that hunt

1.17.2 Identifying as Hunters and Conservationists

Participants were asked in separate questions if they consider being a) a hunter, and b) a conservationist to be part of their identity. Response choices were presented on a 3-point Likert scale. The intention of these questions was to explore if participants perceived what they do as part of who they are. About the same number of participants answered each question on identity, with 4021 responding to the question pertaining to being a hunter, and 4020 responding to the question pertaining to being a conservationist. The results, summarized in Figures 9 and 10 respectively, were slightly different for each question. 75% of respondents affirmed being a hunter as part of their identity, while slightly more respondents (82%) affirmed they considered themselves to be conservationists. A greater number (226) of hunters did not consider 'hunter' to be part of their identity compared to only 85 hunters who did not consider themselves to be a 'conservationist'.

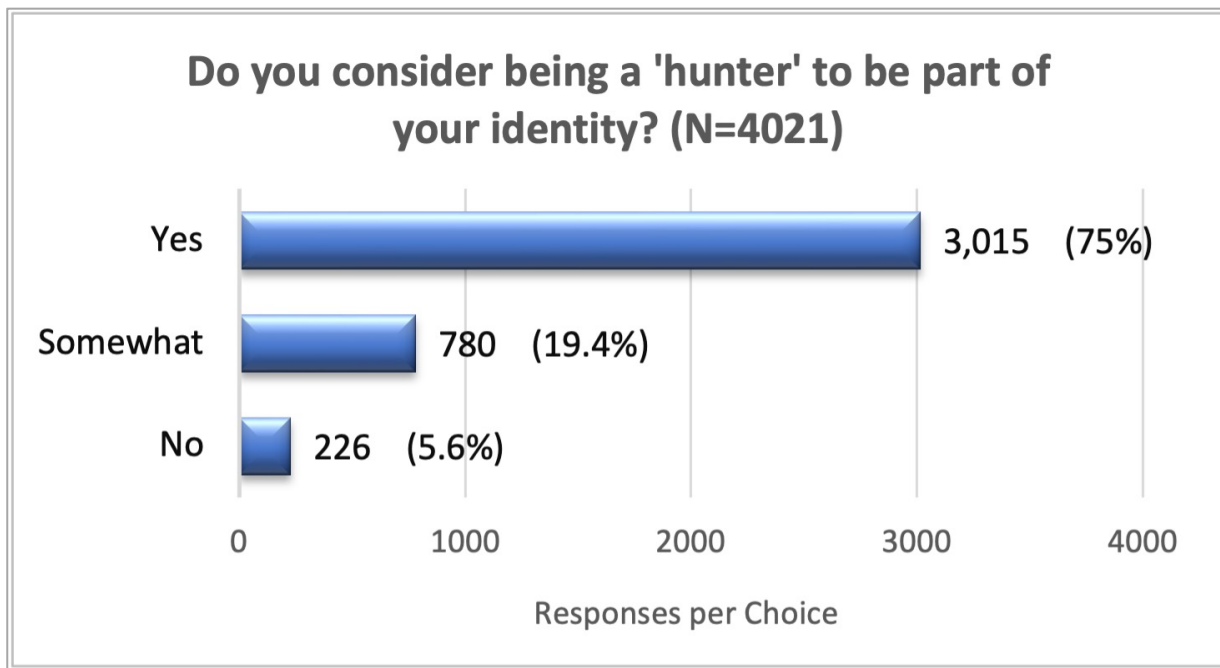


Figure 9: Number of respondents who identify as a 'hunter'

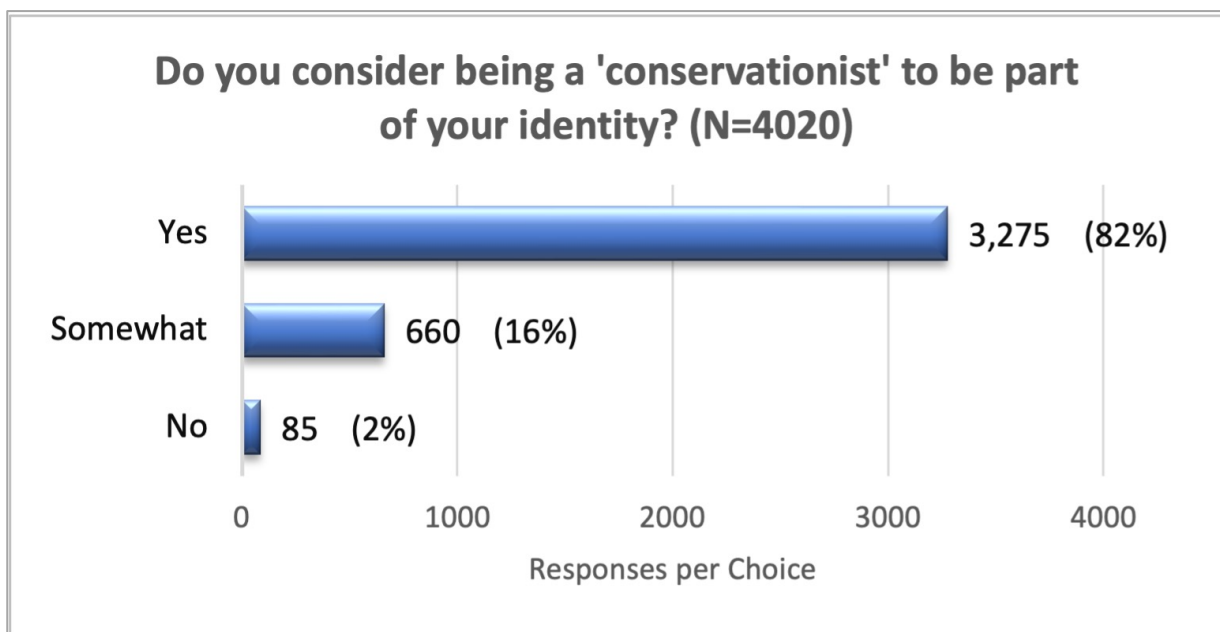


Figure 10: Number of respondents who identify as a 'conservationist'

1.17.3 Common Forms of Hunting

Participants were asked to choose their top 3 types⁸ of hunting in which they most often engage, and were limited to only 3 responses, including ‘other’. The intention was to explore what, if any, relationship exists between chosen hunting practices and types of conservation activities.

Categories of hunting types were determined to roughly align with hunting license distinctions, hunting seasons in Ontario and Canada that either don’t typically overlap or don’t tend to compete, and observations of hunter tendencies I’ve witnessed or experienced first-hand. Hinrichs et al. (2021) similarly used a classification approach to present hunting types, though used different categories and allowed only one option to be selected by respondents.

Other than licensed hunting of migratory birds, which is federally regulated, all other forms of hunting are managed by provincial and territorial jurisdiction through either license, permit, tag, or a combination of these. The list of answer options included forms of hunting commonly practiced, used terms and categories familiar to hunters, and aligned with typical licenses and permits. The list is not exhaustive and did not specify all big game animals, particularly those with limited distribution or hunting access (e.g., pronghorn antelope, bison, elk, muskox).

All survey participants answered this question, and all categories had responses recorded (Figure 11). Responses per type of hunting ranged from a minimum of 20 for falconry, and a maximum of 3,627 for deer and moose. The top 4 types of hunting demonstrated in the results from most to least were deer and moose (90.2%), upland birds (54%), migratory birds and waterfowl (38%) and wild turkey (37.4%).

⁸ Presenting answer options as “types” of hunting is imperfect in that the categories reflect a mix hunting technologies (i.e., shotgun, rifle, bows, birds of prey), and groups of species. Permits, licenses, and tags vary in different jurisdictions. Thus, the types of hunting are an intuitive presentation of how hunters typically understand and describe different forms of hunting.

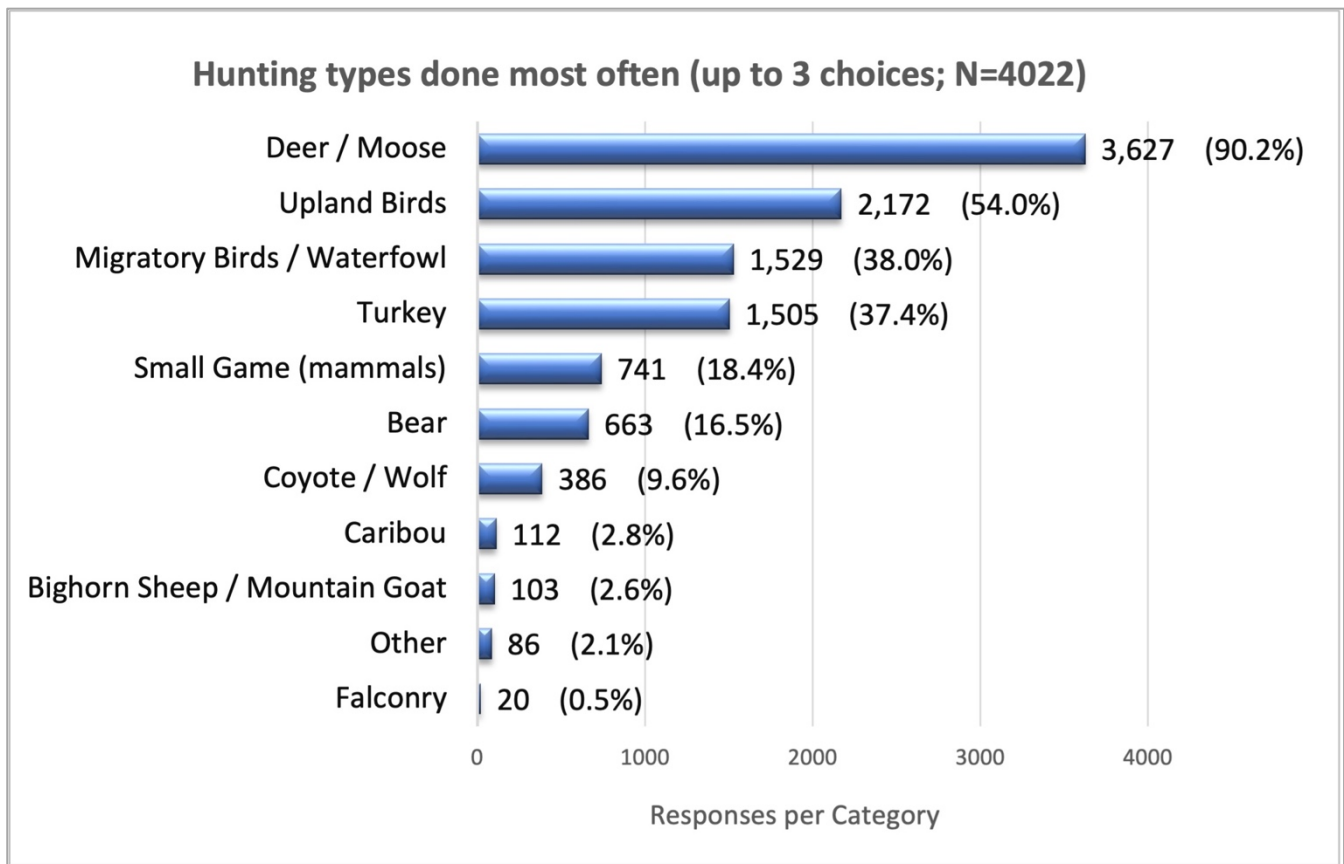


Figure 11: Most common forms of hunting selected by respondents

1.17.4 Consuming Harvest

The question about harvest allowed only a single answer to be selected and did not include the option of 'other'. Respondents were asked to select the answer that applied most often. 98.5% of respondents claimed to either eat the animals they harvested or donate all or a portion of their edible harvest to others (Figure 12).

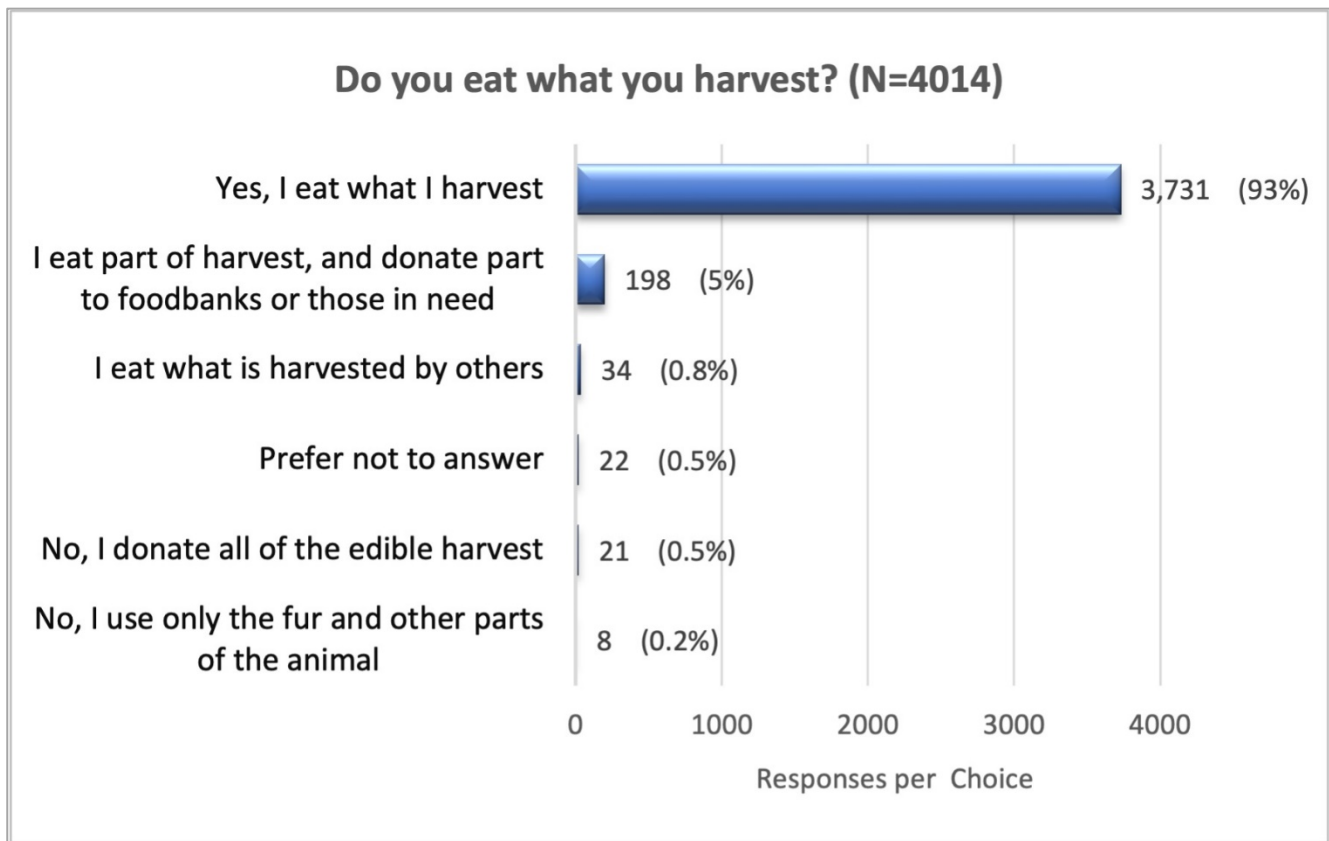


Figure 12: How hunters use harvested animals

1.17.5 Organizational Affiliation

Figure 13 summarizes the organizations in Canada that respondents identified as supporting through either membership, subscription, or donation. Respondents could select all applicable answer choices, including 'other'. Provincial and territorial hunting-conservation organizations, local angler and hunter organizations and naturalist organizations (e.g., regional or municipal rod and gun clubs or field naturalist groups), are typically member-based, but national charitable or non-profit organizations may engage the public through subscriptions or donations, depending on their organizational governance structure. The top three supported organizations identified by name were OFAH (77.6%), Ducks Unlimited (26.1%), and the Canadian Wildlife Federation (14%). The second most populous category with 27.5% of responses 'Local Angler & Hunter Group/Organization' included multiple unnamed local organizations.

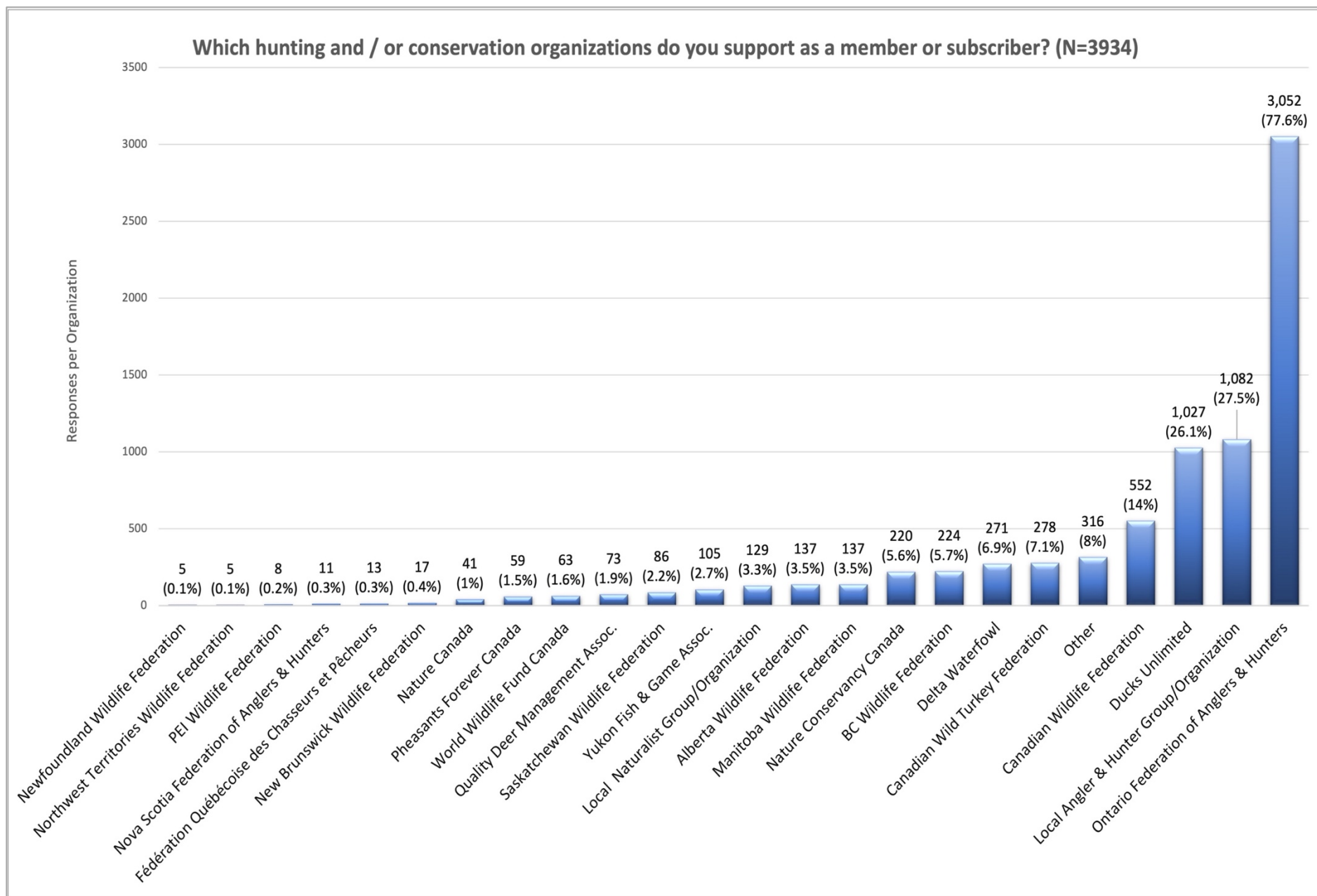


Figure 13: Organizations in Canada supported by hunters through membership, subscription, or donation

The answers were then organized into 5 bucketed categories illustrated in Figure 14:

provincial/territorial angler & hunter organization, national conservation organization, local angler & hunter organization, local naturalist organization, and 'other'. Since responses to 'other' could include a mixture of local, provincial, and national organizations, the numbers in each category will likely change slightly once the text response data is analyzed. Bucketed responses indicate that 97% of participants are members of a provincial or territorial fishing and hunting organization, and 66% of respondents also support a national conservation organization. Nearly 30% of respondents are also a member of a local fishing and hunting organization.

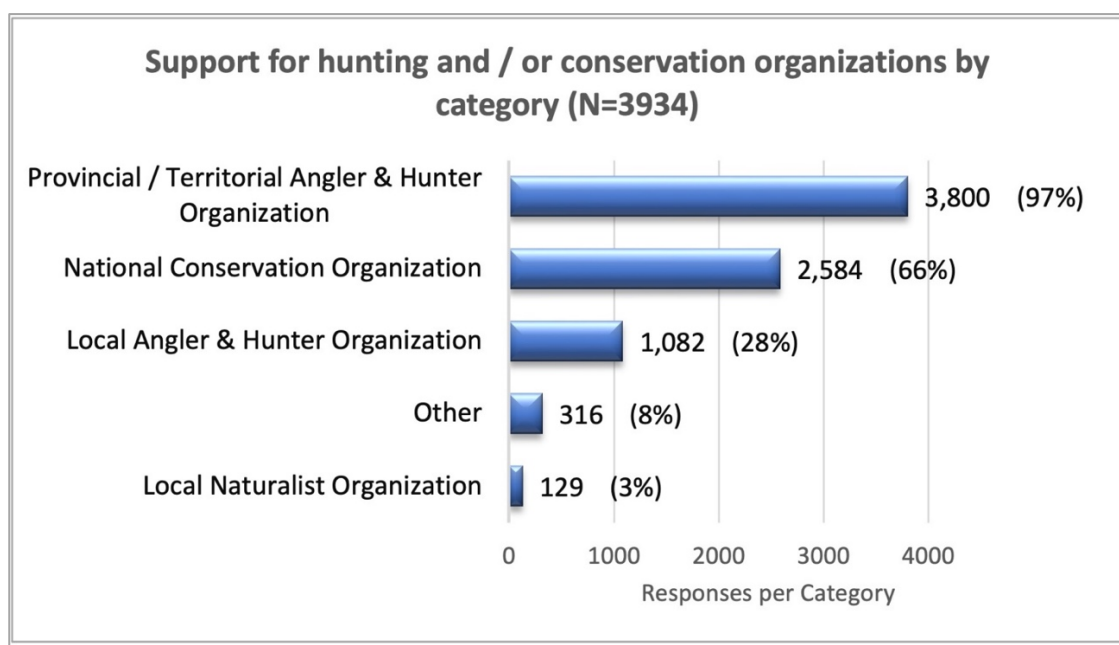


Figure 14: Support for organizations by hunters according to organizational category

1.17.6 Nature-Based Recreation Types

When asked what types of nature-based outdoor activities hunters participate in other than hunting (Figure 15), between approximately 50% to 90% of hunters identified fishing, camping, gardening, hiking and some form of paddling activity. Between 20% and 34% of hunters participate in bird watching, foraging for wild foods, and bushcraft. 11% of respondents selected "other", indicating another activity not listed, and had the option to specify. While the list of outdoor recreational activities other than hunting is not exhaustive, almost 90% of hunters selected at least one of the activities presented.

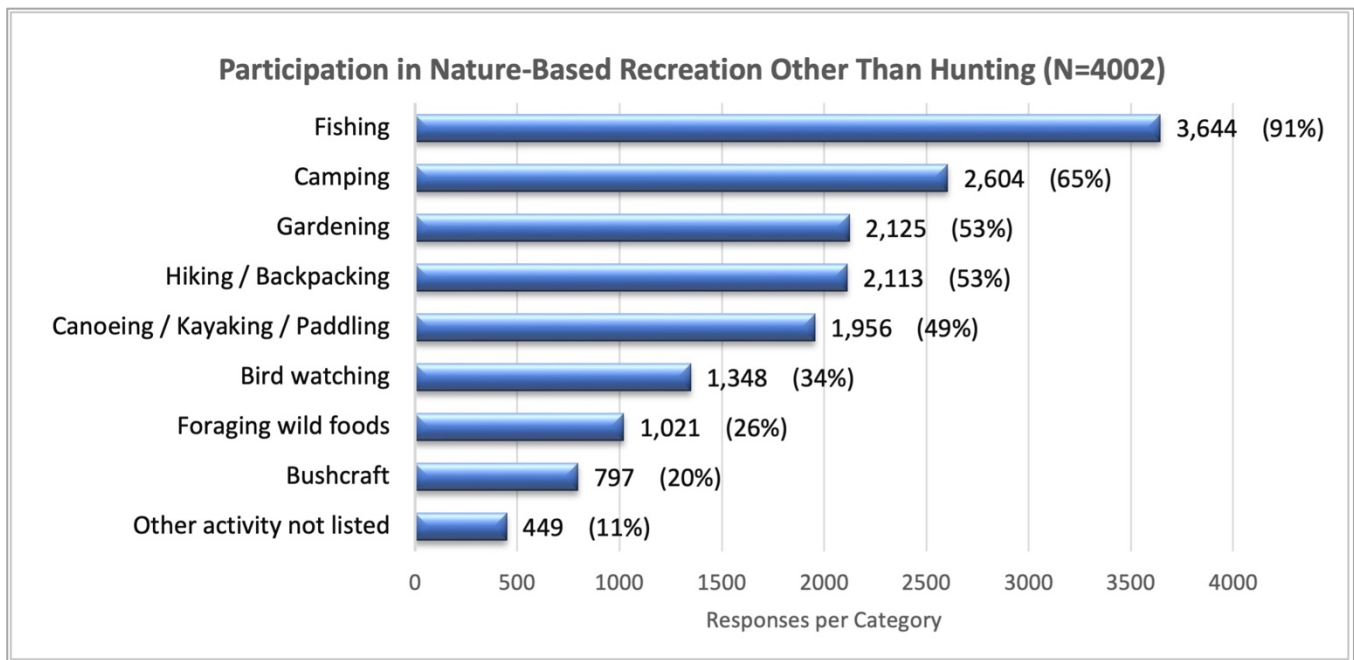


Figure 15: Non-hunting nature-based recreational activities in which hunters participate

1.17.7 Participation in Conservation Activities

The types of conservation activities in which hunters participate directly reflect three main groupings. Of the 91% of people who reported to have partaken in direct conservation, between 9% and 60% selected at least one of the 8 categories available, and 9% opted to add a response that was not listed (Figure 16). The options provided in this question⁹ were primarily based on my personal observations of, and experiences with, conservation, and with hunters and hunting-conservation organizations over several years, as well as some activities identified in academic literature. Each category of direct conservation contains multiple specific activities that were not individually listed since that was outside the scope of this research but deserves further exploration in future studies.

⁹ Conservation actions did not include the option of hunting as a form of conservation. Hunting may be considered a conservation activity in and of itself in instances, for example, to manage overabundant populations, or in the event legally huntable species are having a deleterious impact on localized flora and fauna (Heffelfinger & Mahoney, 2019), though these scenarios are arguably not typical in much of Canada.

The top three conservation activities that between 39% and 60% of hunters selected, from greatest to least, were enhancing their own property to benefit wildlife, being a mentor for conservation, and volunteering for a conservation project or organization. The activities with between 25% and 31% of respondent selections were habitat restoration, building or installing nesting structures, and participating in environmental education. The categories with the least number of selections were species reintroduction (12%) and being a landowner partner in stewardship activities (9%). About 9% of respondents selected ‘other’.

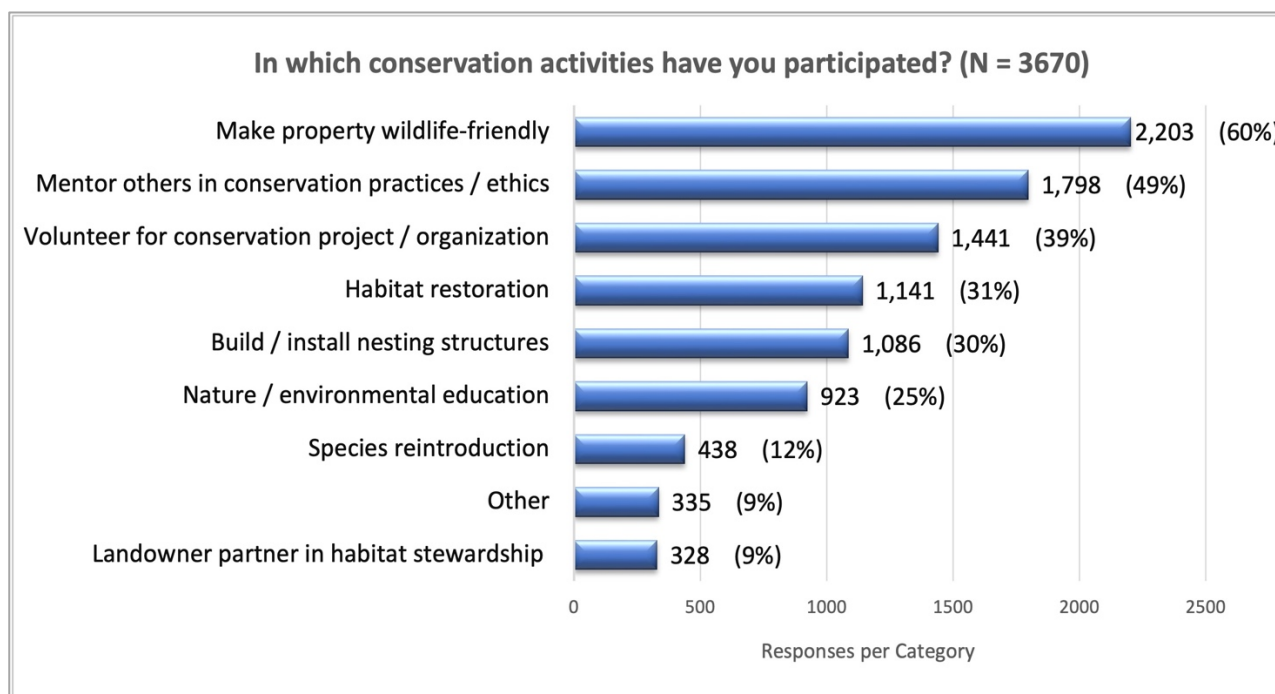


Figure 16: Specific conservation activities in which hunters reported direct participation

1.17.8 Supporting Conservation

A matrix table was used to gather information about the frequency with which hunters support conservation indirectly. In answering the general question about engaging in activities that support conservation, respondents could select one answer on a 3-point Likert scale for each individual statement. Between 97% and 98%¹⁰ of respondents rated the frequency with which they participate in

¹⁰ The question format was a matrix table for which each statement was an optional response to the question “which conservation activities do you do to support conservation?”. The number of responses are included in brackets in for each

activities supportive of conservation. The number of responses per statement ranged from 3959 to 3911 and are listed in the chart from top to bottom in the order of most to least (Figure 17). For each of the 7 types of supporting activities listed, hunters selected 'yes/usually' between 17% and 90% of the time, 'sometimes' between 7% and 52% of the time, and 'no/rarely' between 3% and 68% of the time. Responses to 5 out of 7 activities had higher affirmative (yes/usually) than negative (no/rarely) results. Only responses to one statement, donation of money or materials, had higher responses of 'sometimes' compared to either positive or negative responses.

Purchase of hunting licenses or permits, regardless of the intention to hunt, garnered the most responses. Of the 98% of responses to this statement, 90% selected 'yes/usually'. The second most prevalent way Canadian hunters indirectly participate in conservation is through membership in, or subscription to, conservation organizations, with 66% of statement respondents selecting 'yes/usually', and 20% selecting 'sometimes'. 57% of the 98% of people said 'yes/usually' to prioritizing conservation when voting, and 33% said they did this 'somewhat'. The frequency of donating money or materials to support conservation was rated by 98% of question respondents. Of those, the majority (52%) selected 'sometimes', and 31% responded 'yes/usually'. 51% of the 98% of participants who rated their frequency for supporting friends or family in conservation activities responded 'yes/usually', and 38% responded 'sometimes'.

The two activities undertaken least often, and for which negative responses outweighed 'yes/usually' and 'sometimes', were sending letters or comments to governments in support of conservation, and having a career or job focused on conservation. Writing comments about conservation and having a career in conservation were two distinct statements in question 19 of the survey. Of the 97% who responded to each statement, a frequency of 'no/rarely' was selected by most people. 43% answered 'no/rarely' and 36% answered 'sometimes' to providing letters or comments to governments about conservation issues, and 68% selected 'no/rarely' and 15% selected 'sometimes' to having a job or career in the field of conservation.

individual statement in Figure 17, and the percent of each response selection reflects the proportion of responses per statement.

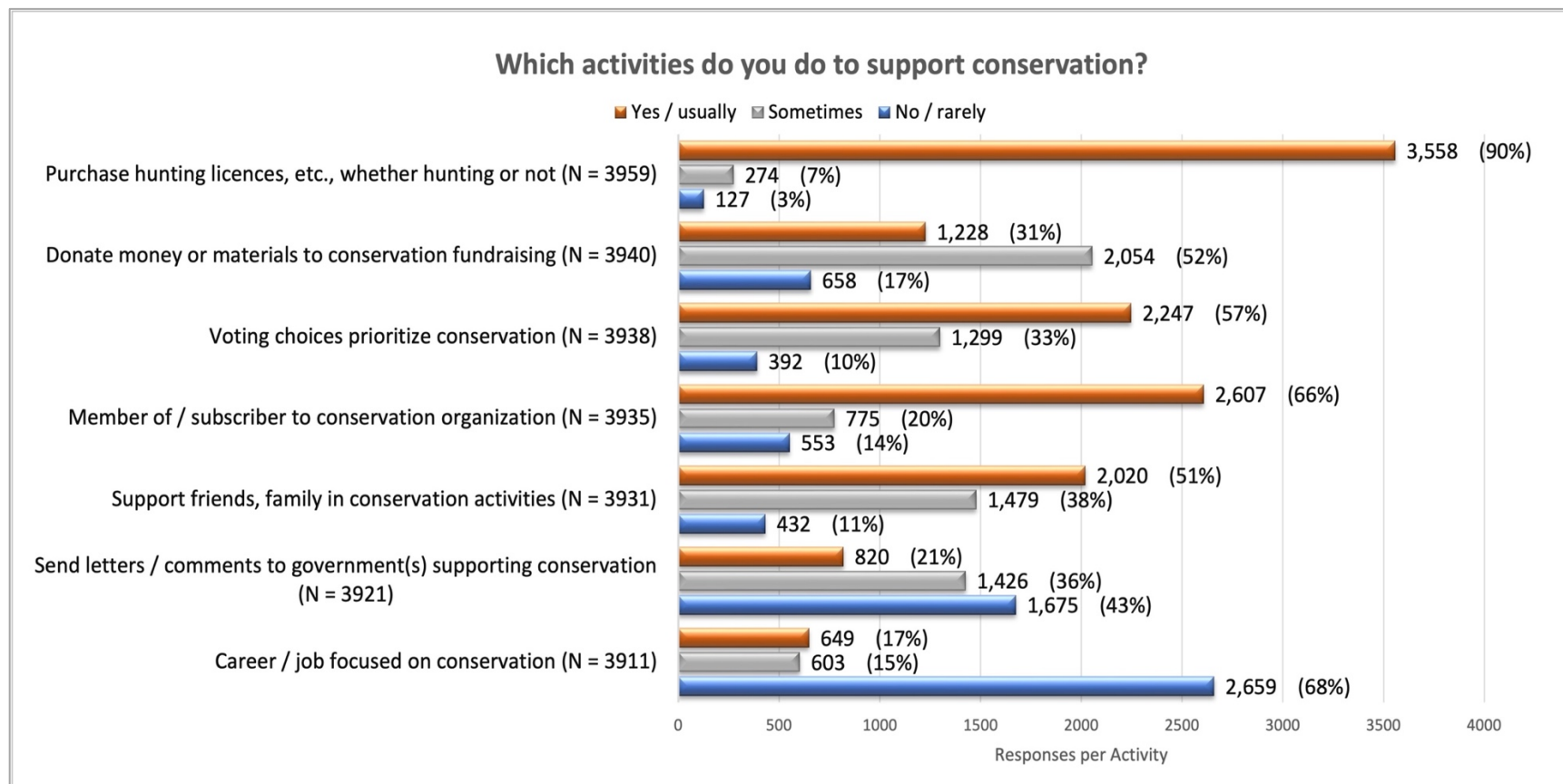


Figure 17: Actions in which hunters reported taking in support of conservation

Note: Each statement in Figure 17 indicates the number of responses per statement (N) in brackets; the percent of responses for each answer category is based on the respective responses per statement.

1.18 Perceptions

The last section of the survey focused on perceptions¹¹ of hunters regarding hunting and conservation issues. Questions were either multiple response (check all that apply) or single responses recorded on Likert scales. The last question in this section was open-ended to allow for text entries, the results for which are not included in this thesis.

1.18.1 Barriers to Conservation

The most prevalent barriers to hunter participation in conservation were identified by respondents as not having adequate funding or resources (47%), and not having enough time (44%). Other barriers identified ranged from 3% to nearly 24% being selected by respondents. 592 participants selected 'other' indicating there are likely other barriers to participation that were not captured in the answer options. Out of 3,768 responses, 234 individuals indicated conservation was not a priority, and only 11 individuals (0.3%) indicated they were not interested in conservation.

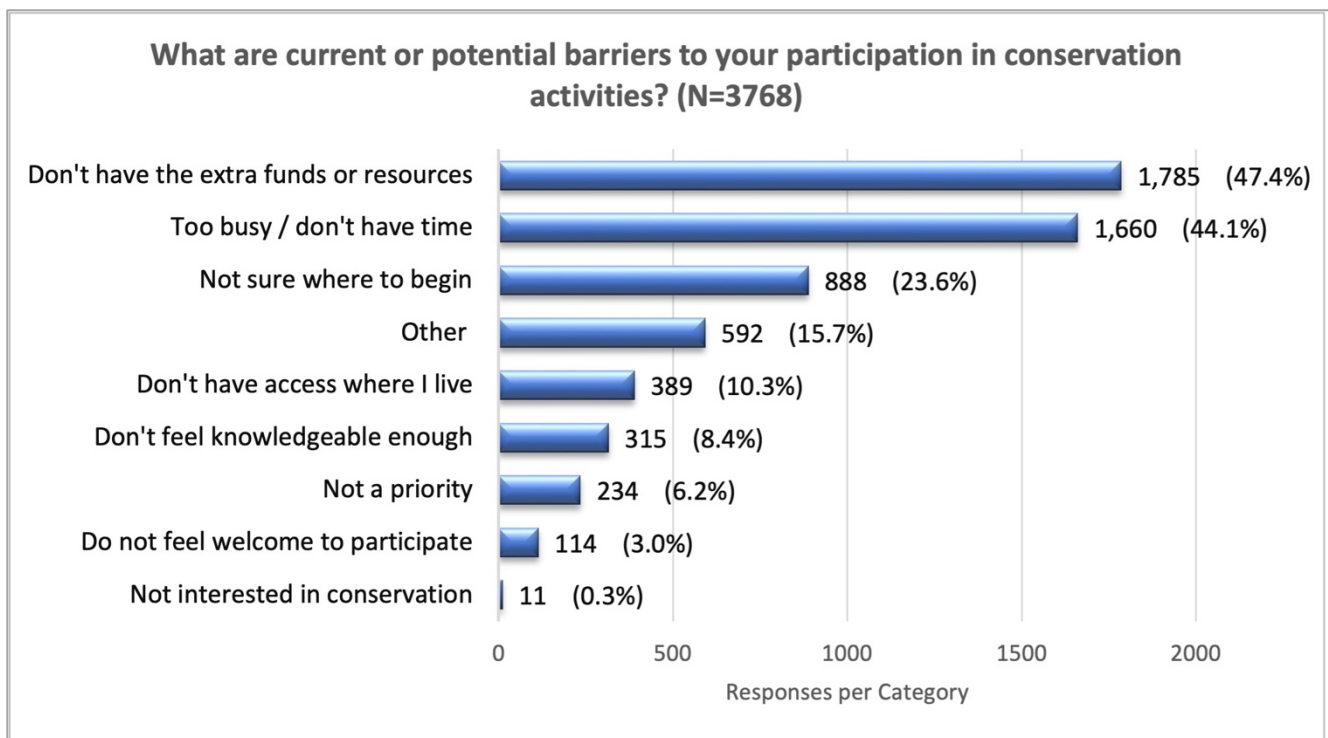


Figure 18: Barriers to participating in conservation experienced by hunters

¹¹ The term "opinions" was used initially in the back end of the survey for this segment of questions.

1.18.2 Threats to Nature and Wildlife

Results for threat selections (Figure 19) appear from most to least selected and, given the number of response options, include a number in brackets to assist in readability. 3,984 respondents made 21,451 selections between 10 categories identifying what they feel are threats to natural places and wildlife. 507 participants (13%) also selected 'other', indicating additional threat categories not listed, and possibly adding threats that could fit within an existing category but phrased differently to the way the answer options appeared. The top 3 threats identified by between 70% and 85% of respondents were loss of or damage to habitat (85%), invasive species (78%), and urbanization (70%). The lowest response rate of all 10 specified threats was to intensive/large scale agriculture (32%).

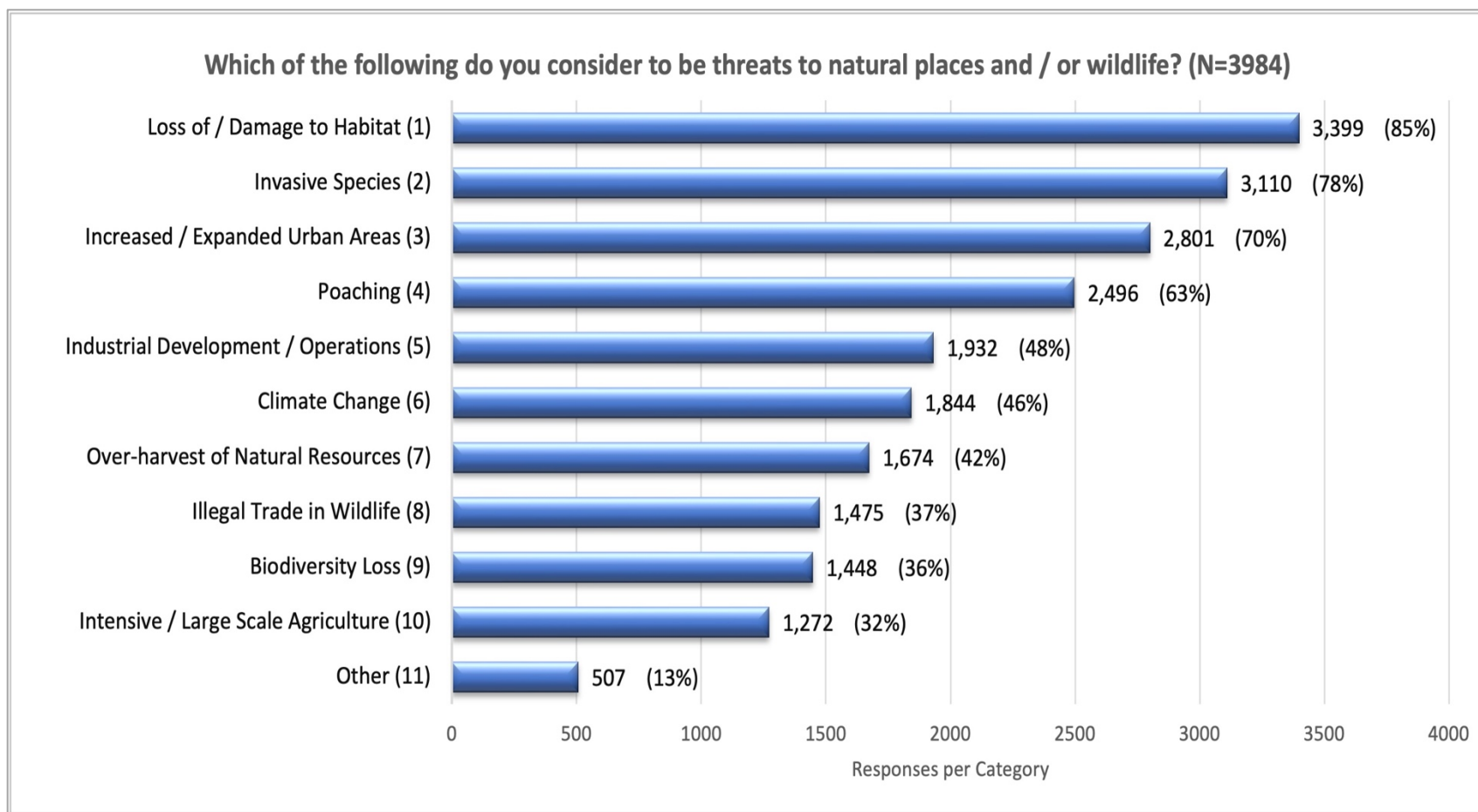


Figure 19: Threats to nature and wildlife according to hunters

1.18.3 Is regulated hunting a threat?

The survey question specified *regulated* hunting for several reasons. First, the specific mechanism used in regulated hunting varies by province and territory. Regulations include government-issued licenses, permits, and/or tags (or combinations thereof), the number of which are determined by the government ministry or agency in each jurisdiction. Harvest quotas and license, permit, and tag allocations and allocation systems are also determined by the government body ideally based on accurate population data, though there may be skepticism about this process (the primary motivation for this question). Second, regulated hunting avoids problematic terms such as ‘recreational’ or ‘sport’ hunting, which don’t provide an accurate description of legally determined ethical hunting activities. Third, regulated hunting does not include either illegal hunting (i.e., poaching), or harvest by traditional rights holders in Canada¹² who may not purchase a license, permit, or tag. Only one selection on a 3-point Likert scale was permitted. The majority of responses (82.5%) indicated ‘no’, while about 5% of responses indicated ‘yes’. 496 individuals considered regulated hunting to be somewhat of a threat (Figure 20).

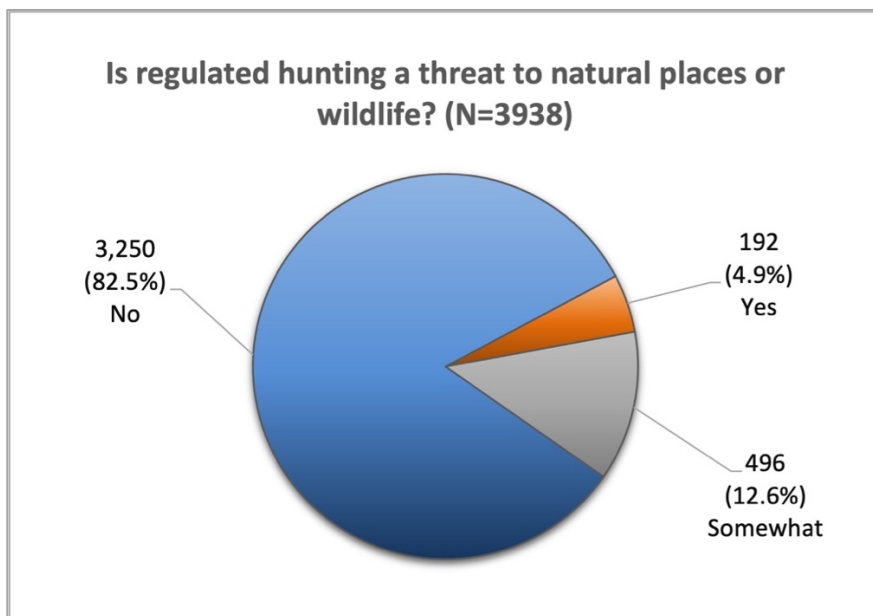


Figure 20: Summary of responses about regulated hunting being a threat to nature or wildlife

¹² Under some circumstances, Section 35 Rights Holders under the Canadian Constitution Act, 1982, are exempt from requiring a hunting license or permit (Boulé et al., 2021).

1.18.4 Inclusion and Understanding of Hunters

Hunters were asked to rate how often they perceive to be included and understood by rating responses to two statements: having their perspectives included in conservation decisions, and being well understood by non-hunters involved in conservation. Responses were recorded using a 5-point Likert scale with response options ranging from 'never' to 'always', and illustrated in Figure 21. While responses to hunter perspectives being included in decision-making about conservation were fairly evenly spread between 'never/rarely' (43%) and 'sometimes' (45%), a majority of hunters who responded to this question (80%) were of the opinion that hunters are rarely or never understood by non-hunters involved in conservation.

How often are the statements true? (N=3928)

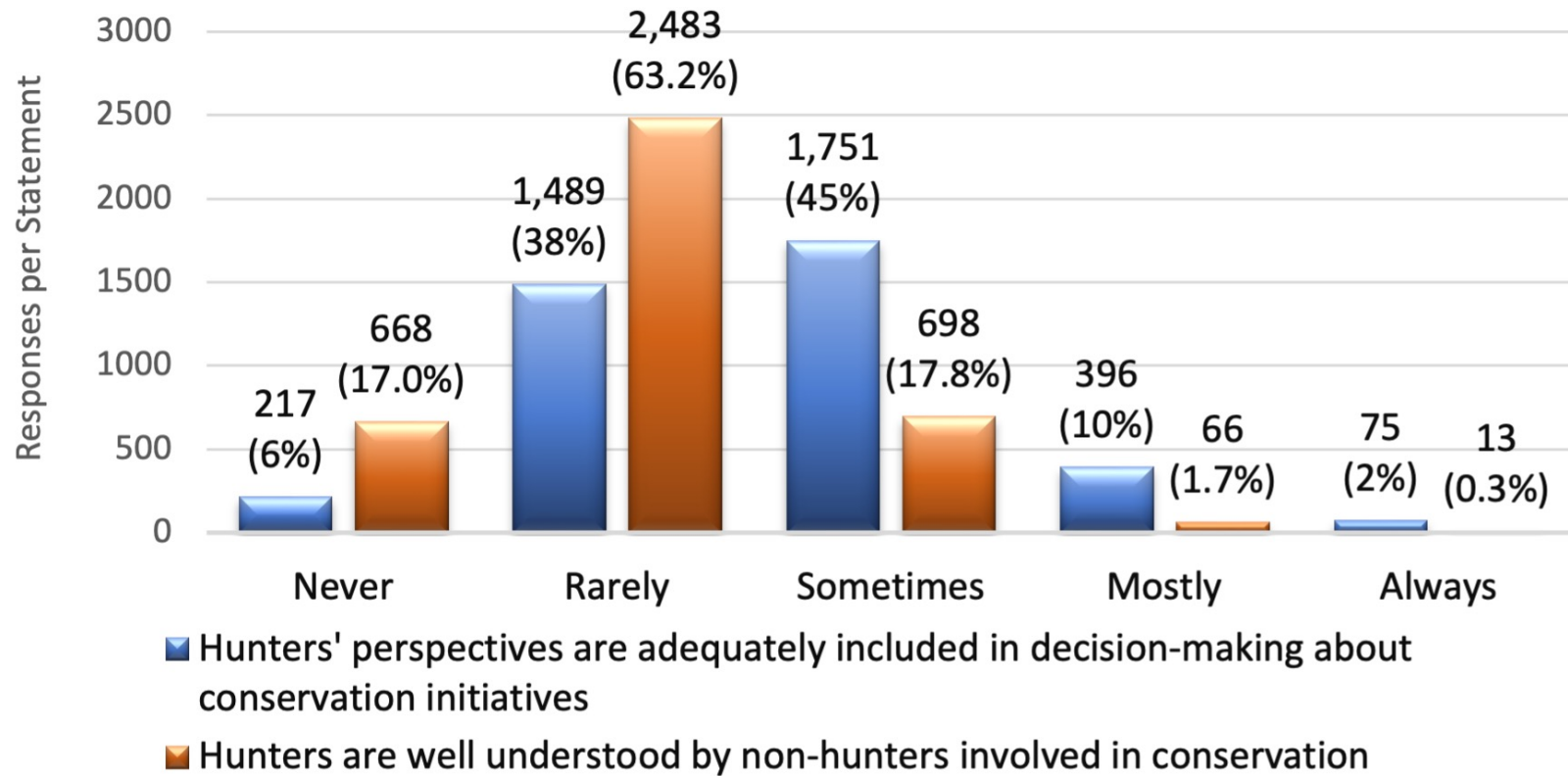


Figure 21: Scaled responses about the degree to which hunter perspectives are included in conservation decision-making and understood by non-hunters

1.18.5 Extent of agreement about hunting and conservation

Using a 5-point Likert scale, participants were asked to what extent they agreed with statements about hunting and conservation. The statements were not directly related to one another, other than seeking the extent to which respondents agreed. As demonstrated in Figure 22, most respondents either strongly agreed, or strongly disagreed with the statements. 97% of hunters did not agree with the statement that hunting is harmful to conservation, while 94% agreed hunters have valuable knowledge to contribute to conservation, and 87% agreed it's important for all hunters to participate in conservation.

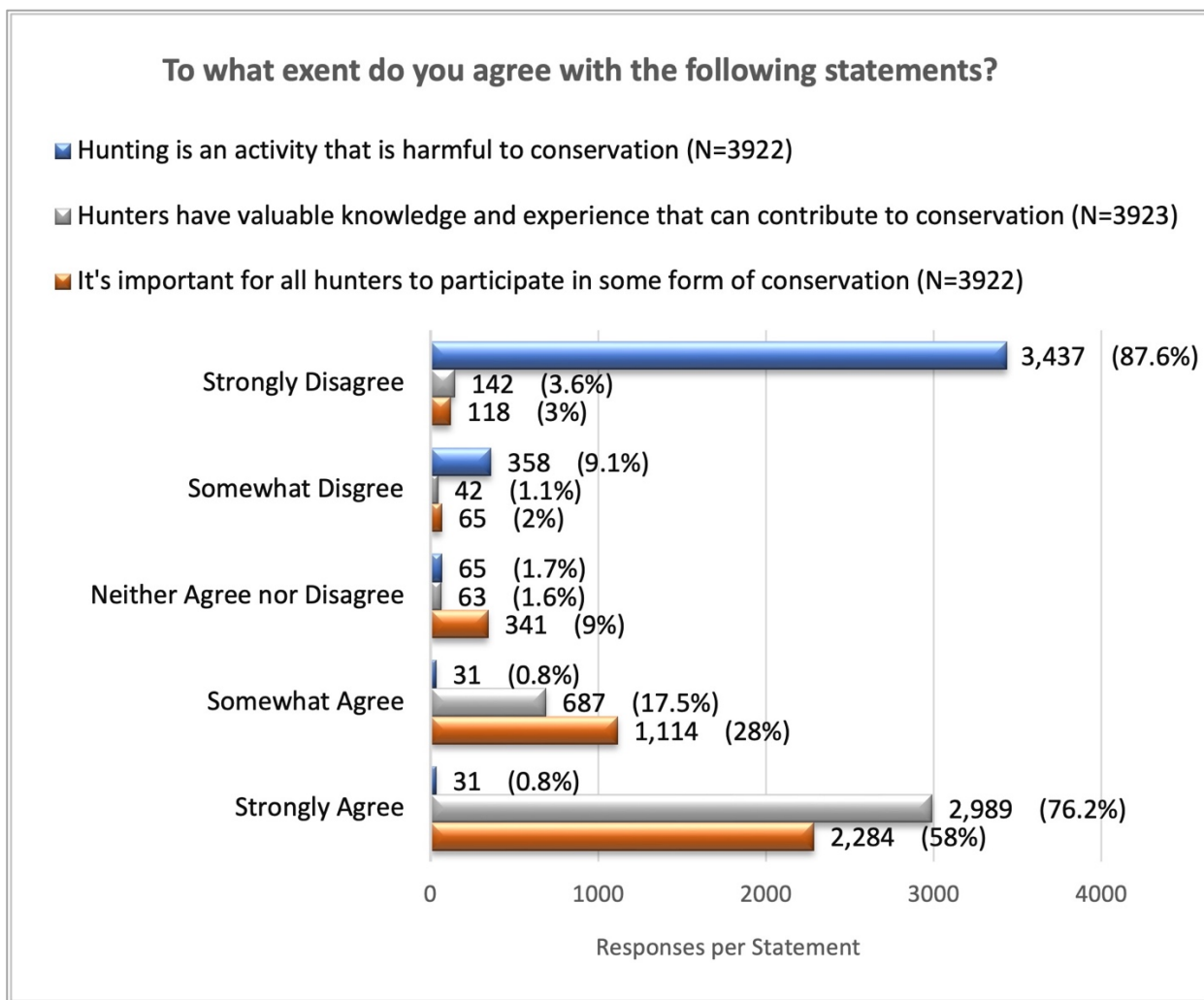


Figure 22: Scaled levels of agreement with statements about hunting and hunters in relation to conservation

1.18.6 Hunters' Feelings About Conservation

The survey presented 5 statements about conservation and asked participants to rate how closely each statement described their feelings using a 5-point Likert scale. Response options ranged from 'clearly describes my feelings' to 'does not describe my feelings'. Each statement response was optional. Response numbers vary slightly between 3905 – 3911 per statement, which equates to 97% of survey respondents answering this question.

The responses are presented in two separate graphs (Figures 23 and 24). Since there were clear trends in how participants rated their feelings, each graph illustrates statements with a similar trend of responses (i.e., clearly describes feelings versus does not describe feelings). Most responses demonstrated in Figure 23 align with feelings being 'clearly' or 'mostly' described. In response to "I care about conserving all species and habitats", 65% said this statement clearly described their feelings, and 25% said it mostly described their feelings. Combined, 90% of respondents felt strongly about conserving all species and habitats. In response to the statement "hunting is a way for me to connect with nature", 63% and 24% said this 'clearly' and 'mostly' described their feelings respectively, reflecting 87% of respondents who were strongly aligned.

Figure 24 demonstrates the opposite trend: respondents' feelings were generally not described in response to the statements presented. The trend of responses here were more clearly aligned with 'does not describe my feelings', compared to responses depicted in Figure 23. 72% of hunters' participation is not contingent upon working with people that share their political beliefs. 80% of hunters did not agree that conservation only of species they hunt describes their feelings, and 94% disagreed with the statement of not being interested in, or concerned about, conservation.

How closely do the following statements describe your feelings?

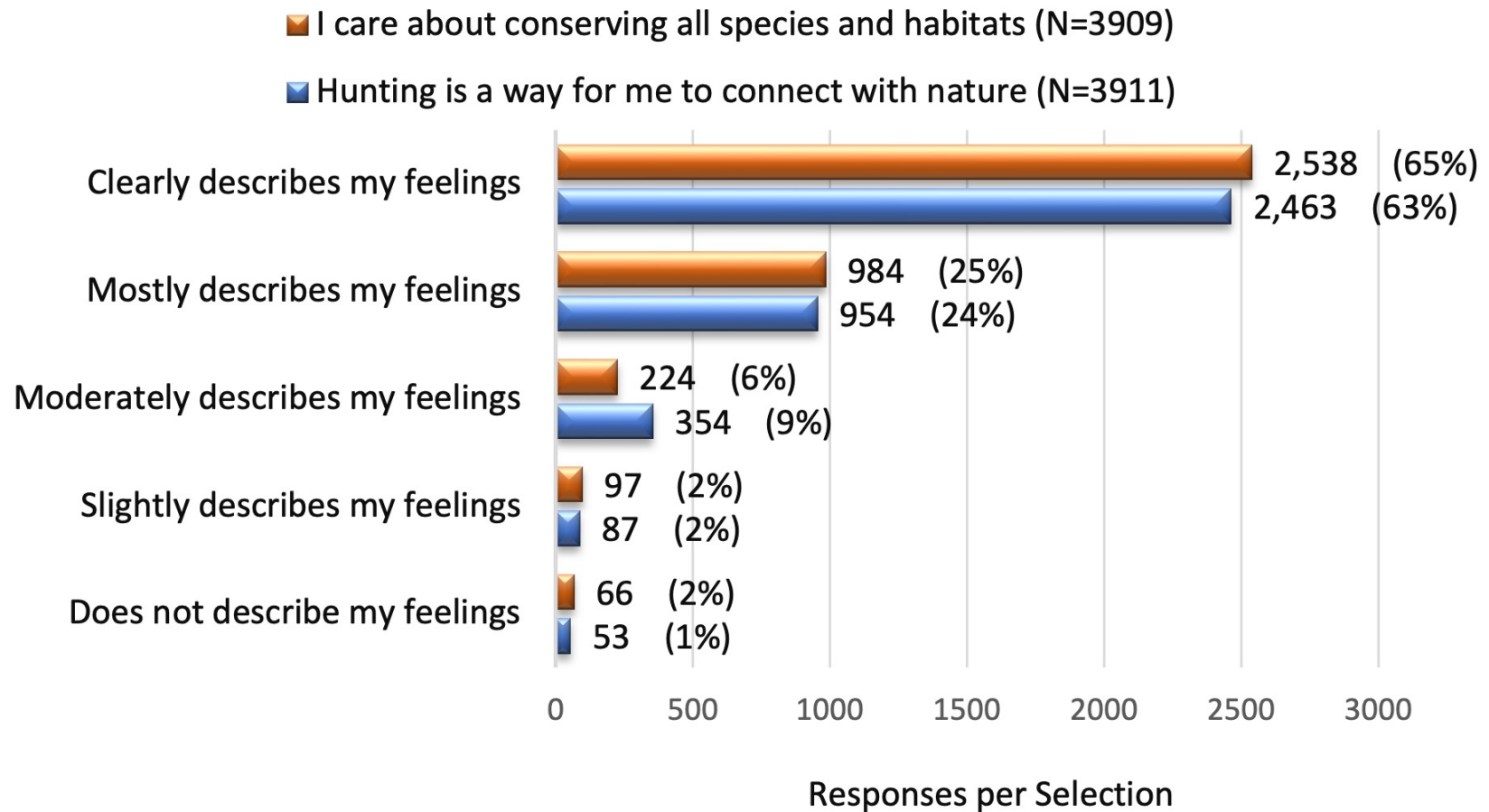


Figure 23: Scaled responses of hunters' feelings about nature and conservation

How closely do the following statements describe your feelings?

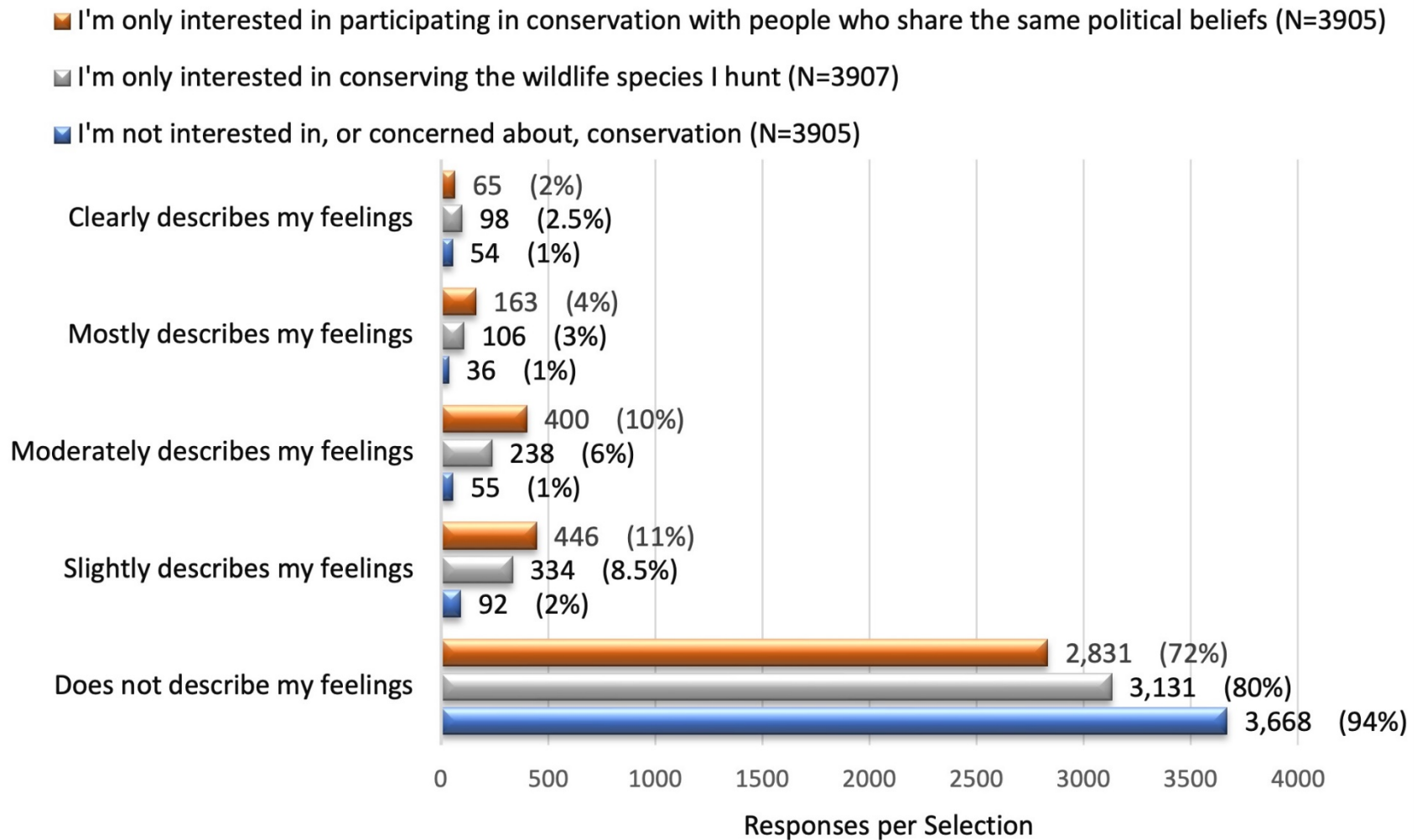


Figure 24: Scaled responses describing hunter interest in conservation

Chapter 5

Discussion

The primary research questions I sought to answer were: *Do hunters in Canada perceive that they contribute to conservation, and if so, in what ways?* Associated questions explored the extent to which hunters perceived themselves as being conservationists, and their thoughts about nature and conservation generally. Along with my research questions being answered, the high number of responses¹³ and breadth of answers selected present further opportunities for analysis of results (i.e., cross-tabulations) that are outside the scope of the descriptive analysis for this thesis and will occur in future. There are also additional questions that have been raised as part of this research that warrant further exploration. Such areas are noted throughout the discussion.

1.19 Summary of Findings

Findings from the survey provided insights about hunters in Canada that are not currently reflected in the literature. One such notable finding is that most respondents perceive themselves to be conservationists. While this may not be a surprise to many hunters, it is certainly not the predominant view found in academic literature regarding hunters, likely due to hunters not typically being asked directly about their own feelings and perceptions. This empirical study seems to be the first of its kind in Canada to focus exclusively on perceptions of hunters as a nature-based outdoor recreational group on the topic of conservation. Bennett (2016) defines perceptions as “...the way an individual understands, interprets, and evaluates a referent object, action, experience, individual, policy, or outcome”, and highlights the importance of incorporating perceptions of community experts such as hunters in social research that can improve conservation outcomes. Concentrating research on hunters as one segment of the outdoors community follows advice noted in previous studies (Cooper et al., 2015; Teisl & O'Brien, 2003; Thapa, 2010): that nature-based outdoor recreationists should be studied separately to gain a better depth of understanding of each group.

¹³ A high number of responses is considered 1000 or more (Hinrichs et al., 2021).

Survey results also indicated hunters in Canada identify and/or postulate that they contribute to conservation in direct and indirect ways. Involvement in conservation reported by hunters included making their property more friendly to wildlife, providing conservation mentorship, volunteering for conservation, restoring habitat, building and installing nesting structures, and contributing through nature education, species reintroductions, and as landowner partners in habitat stewardship. Hunters identified they support conservation through the purchase of hunting licenses and permits, as members or subscribers to conservation organizations, with their voting choices, by supporting family and friends in conservation activities, by donating to conservation fundraising, and to lesser extents through writing letters or comments to governments about conservation issues, and having jobs or careers in the conservation sector. Each of these conservation actions easily represents a suite of activities that deserve attention moving forward. In-depth exploration of each of these forms of conservation should be pursued in future empirical studies, thus contributing to understanding ways in which hunters in Canada engage with conservation.

Along with seeking information from hunters about the kinds of involvement in, and support for, conservation, my research sought to provide a broader understanding about how hunters orient to nature and to conservation generally, again by asking them directly. In addition to hunting, hunters said they participate in a range of nature-based outdoor activities and identified various threats to nature and wildlife. Hunters agree conservation is a priority and feel they have skills and experience to contribute to conservation efforts. They asserted they care about conserving all species and habitats and are willing to collaborate to achieve conservation outcomes, though also experience some barriers to participating in conservation activities. This additional context helps add depth to understanding hunters in Canada and presents opportunities for conservation planners in any sector to consider how hunters may be more effectively included in conservation decision-making, project participation, and in achieving conservation outcomes.

1.20 Demographic Considerations

In the context of conservation, hunters as a group of outdoor recreationists have been disparaged for perpetuating settler colonialist ideals and inequities by not reflecting the current diversity in society (Nagle & Vidon, 2022; Peterson & Nelson, 2017). Demographic data from my survey showed little variability in some characteristics. Between 99% and 100% of survey participants completed the

questions on demographics (Figures 1 – 7). Respondents were 94% male, 79% in the two higher age categories (38% over the age of 46, and 41% over the age of 65), 60% politically Conservative, 83% from Ontario, with 87% identifying as having a Canadian cultural background. The most variability was in results of residence setting, with 23% urban, 35% suburban, and 41% rural (see Table 3 for additional explanation on characteristics of residence locale).

However, differences can occur across regions (Hinrichs et al., 2021). Notably not well represented were hunters from regions outside of Ontario, women, Indigenous, and those with a cultural background other than Canadian. As well, NGOs in Canada have varying sizes of membership and organizational capacity ranging from having a large staff base to being operated entirely by volunteers (Cooke et al., 2016). OFAH is a large organization with enough staff capacity to facilitate dedicated survey distributions compared to other provincial and territorial organizations that are operated by few or no staff. Due to the overwhelming response from OFAH members, it appears that the survey demographics reflect OFAH membership rather than hunter demographics in Ontario or in Canada, which may or may not reflect similar demographics.

Hunting in North America has traditionally been male-dominated. In a survey of hunters from 8 Midwest states in the U.S., Hinrichs et al. (2021) found respondents to be between 73% and 91% male, depending on the state and type of hunting practiced, and mostly from Baby Boomer and Generation X years of birth¹⁴. Cooper et al. (2015) found that 93% of hunters surveyed in rural New York State were male and tended to be more politically conservative. Heberlein et al. (2008) found the population of female hunters in North America to be between just under 4% and 22% depending on the state or province, though the data from 5 Canadian provinces was aggregated with the data from all 50 states. Other than noting Saskatchewan had less than 4% female hunters at the time of the study, specific data from the other provinces was not made available. The trend of female hunters in Canada has been increasing (Mcfarlane et al., 2003). This aligns with the increasing participation of women in all forms of outdoor recreation, particularly since the 1990s, in the United States (Cordell, 2008).

¹⁴ Birth years listed as 1946 – 1964 for Baby Boomers, and 1965 – 1980 for Generation X.

Also underrepresented were Indigenous hunters. In developing the survey and survey materials (e.g., survey invitation, information letter), I used terminology such as “hunters in Canada”, rather than “Canadian” hunters, or “licensed” hunters, to minimize nonresponse bias and be inclusive of those who are Indigenous and may not identify as Canadian or may not hold a license. It’s likely that the hunting-conservation organizations who distributed the survey have relatively low Indigenous membership or followers on social media, and thus those from First Nation, Inuit, and Métis communities would have been unaware of the survey. I did not specifically reach out to Indigenous organizations or nations. Future studies on this topic might focus on gathering information from Indigenous perspectives in Canada using culturally appropriate protocols and research methods for First Nations, Inuit, and Métis respectively.

Some of these demographics may be less reflective of hunting and more reflective of outdoor recreationists in Canada generally (Ho & Chang, 2022). In a survey of Christmas Bird Count volunteers in the U.S., Shipley et al. (2019) found that while only 53% were male, 95% were white. Carter & Allured (2022) found that racialized (i.e., non-white) rock climbers in North America were less prevalent, and that the climbers who were racialized preferred to climb indoors rather than outdoors. Future studies could draw from hunting license data or other available statistics to get a more accurate sense of current hunter demographics across Canada.

1.21 Findings Reflect Four Main Themes

Findings of my research are organized into four key thematic topics: hunters identify as conservationists, hunter involvement in conservation, hunters as political actors, and hunters as allies for conservation. Results are discussed according to each of these themes.

1.21.1 Hunters Identify as Conservationists

82% of participants responded ‘yes’, that being a conservationist is part of their identity, and 16% responded it is ‘somewhat’ part of their identity (Figure 10), compared to 75% who selected ‘yes’ to having ‘hunter’ as part of their identity, and 19% responding with ‘somewhat’ (Figure 9). The clear ‘yes’ response was more strongly reflected in having a conservationist identity, and in aggregate, 98% of hunters identified to some degree with being a conservationist, while slightly less (95%) identified to some degree as hunters.

There is a confluence of other survey responses that may help to explain this result. 98% of respondents said they supported at least one hunting and/or conservation organization through membership, subscription, or donation, with the majority belonging to both a provincial/territorial angler and hunter organization, as well as a national conservation organization (Figure 14). This corroborates findings of Teisl & O'Brien (2003) that those who participate in forest-based recreation, including hunting, are more likely to donate to, or join, conservation organizations.

1.21.1.1 Hunters stated broad interests in, and concerns about, conservation

A common criticism of hunters is that the types of conservation in which they're interested are only of benefit to the species they wish to hunt (Holsman, 2000), though I'm not aware of any empirical research on actual conservation actions of hunters in North America (as opposed to values and attitudes used to attempt to predict behaviour) that explores this assumption. 97% of respondents rated their feelings for two survey statements on this topic. To the statement *"I'm only interested in conserving the wildlife species I hunt"*, 94% selected 'Does not describe my feelings' (Figure 24). To the statement *"I care about conserving all species and habitats"*, 65% selected 'Clearly describes my feelings', and 25% selected 'Mostly describes my feelings' (Figure 23). 99% of hunters surveyed identified multiple threats to natural places and wildlife (Figure 19) that reflect a wide range of concerns about conservation.

Of the 98% of those who rated their level of agreement, (Figure 22), 58% strongly agreed and 28% somewhat agreed that it's important for all hunters to participate in some form of conservation. An even greater proportion (76%) strongly agreed that hunters have valuable knowledge and experience to contribute to conservation, and 17.5% agreed somewhat (Figure 22). Hunter knowledge may arguably be considered local ecological knowledge or stakeholder knowledge, the insights of which are of import to resource and conservation management (Cooke et al., 2016; Pretty et al., 2009).

While it may be difficult to collect evidence from individual hunters that prove or disprove responses to these statements, current conservation initiatives conducted and/or supported by hunting groups or organizations at multiple scales throughout Canada could be identified and collated as part of future research.

1.21.1.2 Hunters stated participation in forms of outdoor recreation other than hunting

The hunters who responded to the survey appear to not solely be hunters, but also assert spending time in nature doing other activities. 99.5% of respondents identified at least one other nature-based outdoor recreational activity in which they participate, with the majority of those selecting at least two other activities in addition to hunting (Figure 15). The listed activities were fishing, camping, gardening, hiking/backpacking, paddling, birdwatching, foraging wild foods, and bushcraft, with 11% of question respondents selecting “other”, indicating participation in outdoor activities that were not specified in the survey.

Monroe et al. (2021) found that people who regularly have nature-based experiences have a stronger environmental identity than those that have less frequent or minimal time in nature. In addition, people regularly involved in nature-based activities in addition to hunting demonstrate greater participation in conservation. Cooper et al. (2015) determined that those who both hunted and birdwatched regularly were more engaged in conservation and were 8 times more likely to perform conservation behaviours compared to those who did neither. Their results differed from my findings in that less than 1% of their respondents both hunted and birdwatched, compared to 34% of respondents to my survey who indicated they also participate in birdwatching specifically.

1.21.2 Hunter Involvement in Conservation Activities

Most hunters reported contributing to conservation both directly and indirectly. Direct activities have an immediate effect on conservation outcomes, while indirect behaviours are supportive of conservation efforts, meaning their effect on conservation outcomes may not be immediately clear, specific to a project, or the impacts may be eventual (Mcfarlane & Boxall, 1996; Nilsson et al., 2020). 91% of all survey respondents identified at least one type of conservation activity in which they have participated directly (Figure 16) and at least 97% of hunters surveyed rated the frequency with which they support conservation activities (Figure 17), indicating that hunters may practice and support a range of conservation activities; some more strongly or regularly than others.

Few empirical studies have addressed conservation behaviours of hunters in North America¹⁵, and most tend to include hunters as a portion of other groups included in the sample. Cooper et al. (2015) included hunters from two counties in New York State in their opinion survey of hunters, birdwatchers, and landowners. Their study included conservation behaviours similar to those included in this study: habitat enhancement, support for conservation policy, donating to conservation, and membership in an environmental group. In a survey of Minnesota waterfowl hunters, Schroeder et al. (2021) categorized personal conservation actions that included donating funds to wildlife conservation organization, volunteering for habitat improvements, and voting for conservation. Boulé et al. (2021) focused entirely on hunters in their 25 interviews from five hunting districts in British Columbia, though their work focused on themes around the role of hunting in wildlife management that included conservation generally, rather than specific actions. I found no single academic study that identified the types of direct and indirect conservation included in this research. Thus, not all the specific conservation behaviours reported by hunters in my survey have comparable academic literature.

1.21.2.1 Making property more friendly to wildlife

60% of those who answered this question identified making their property more friendly to wildlife. This could mean anything from planting native species, creating pollinator gardens, or putting decals on windows to help birds avoid collisions. Depending on the size and location of the property, it could mean even more ambitious undertakings. I didn't specify the type of property, so responses could include recreational properties, farms, etc., which may lean towards certain types of initiatives more strongly associated with certain types of properties and their respective locations. For example, residential properties may have a pollinator garden, while a recreational property used for hunting may have a food plot.

Snyder et al. (2022) found that family forest owners (FFOs) in several counties in northern Minnesota, that also identified as hunters, reported engaging in some conservation activities on their private property more so than FFOs who did not have a hunter identity, though also recognize the limited

¹⁵ Hunting in both Canada and the United States has more similarities than differences post-colonization regarding its history with conservation and development of wildlife management strategies that are reflected in the North American Model of Wildlife Conservation (Heffelfinger et al., 2013; Mahoney et al., 2015).

literature on the subject and called for a greater range of conservation activities to be studied. More information is needed about the specific types of actions hunters take to make their properties more wildlife-friendly, and if there are patterns in the types of improvements that take place based on property type.

1.21.2.2 Being a conservation mentor

Mentorship for conservation or conservation ethics was the second most selected response, with 49% of those who selected this option identifying this as something they've done. While they may overlap, 'conservation' and 'conservation ethics' are not necessarily the same thing. Conservation is an action in which people participate, and conservation ethics are the values or principles that inform behaviour.

Hinrichs et al. (2021) noted that mentoring people to learn how to hunt was one of the motivations hunters had for participating in the activity. Peterson (2014) found that while there was clear communication by U.S. hunting NGOs and in state hunter education manuals about ethical hunting, this communication did not extend to generally preserving biodiversity or conserving wildlife in any of their own literature. While this may be the case for the U.S. organizations referred to by Peterson et al., (2014), the hunting-conservation organizations in Canada that are affiliated with the Canadian Wildlife Federation each address the importance of, and/or their dedication to, conservation, most of which currently include statements on the landing pages of their websites.

1.21.2.3 Volunteering for a conservation organization or project

Nearly 40% of question respondents (36% of all survey respondents) said they have volunteered for a conservation organization or project. This question option did not specify the difference between types of volunteerism because I intentionally wanted to capture a broad sense of what volunteering might mean. Similar to how "stewardship" is viewed, outside of a common understanding of contributing unpaid time to an endeavour that is optional (i.e., not employment), volunteering could mean different things to different people (Roach et al., 2006).

There are some typical ways in which hunters might give freely of their time to conservation organizations or projects. Non-profit organizations in Canada, including those focused on hunting and conservation, are required to use volunteer boards of directors as part of their governance structure. Most volunteer directors of hunting-conservation organizations have experience with hunting and/or

conservation¹⁶, although hunters may volunteer for conservation organizations that have nothing to do with hunting. Many organizations, particularly larger ones that employ staff, also have advisory committees and working groups comprised of volunteer members that provide direction and recommendations to the board, executive committee, or senior staff, while smaller hunting-conservation organizations are operated entirely by volunteers. This type of participation represents one form of volunteerism.

Some organizations utilize volunteers for fundraising, or to support or entirely carry out conservation projects. Heffelfinger et al. (2013) note that hunters and the organizations to which they belong have a history of volunteering for a range of projects that improve wildlife habitat. The types of projects were not specified in the survey, but these could include volunteering at a fish hatchery or releasing fish fry, participating in a collective project such as building nest boxes, or contributing to citizen science projects like the iNaturalist BioBlitz or the Christmas Bird Count.

While it was beyond the scope of my research question, a follow-up study should focus on gathering information from hunters about the specific types of volunteering they practice, and for which organizations or organization types; that would help further the understanding about the role hunter-volunteers play in conservation.

1.21.2.4 Restoring habitat

1,141 respondents said they have participated in habitat restoration. Restoring degraded or lost habitat typically occurs on larger scales on the landscape, or with landscape-scale impacts in mind, since habitat involves much larger areas than strictly where a species dwells or nests. In some cases, this may overlap with making property more wildlife friendly, though it depends on the property size and nature of changes. Typically, habitat restoration is not carried out by an individual in isolation; it is part of a collective effort of people or organizations, many of whom have expertise in given project types. The contexts vary widely and can include small-scale projects designed, for example, to rehabilitate an agricultural field into a pollinator meadow, to larger projects such as mine rehabilitation

¹⁶ Not all volunteer directors are hunters; some may have experience solely with angling, trapping, competitive shooting, conservation, research, or other type of special expertise, depending on the areas of focus and needs of the organization.

that takes place as part of fulfilling environmental assessment expectations. Hunters' and hunting organizations' participation in species restoration is well-documented, and protecting and preserving habitat is an ongoing common role of hunting-conservation NGOs (Arnett & Southwick, 2015; Heffelfinger et al., 2013). Beyond fluid information that may be presented on organizational websites, social media platforms, or newsletters, I found very little research that documents habitat restoration efforts by hunters.

In some cases, hunters may be part of an organizational effort to offer on-the-ground support to such projects, particularly in their own communities, and some organizations make a point of including volunteers and stakeholder groups to conduct portions of restoration work. More information about the types of restoration, associated organizations, and the contexts in which hunters participate is needed. Given the specialized nature of restoration, knowing what portion of hunters participate in restoration as part of their career versus as a volunteer would be helpful. It's also possible that some activities respondents had in mind were not actually "restoration" but may have been or intended to be beneficial to wildlife nonetheless, particularly since 99% of participants identified multiple threats to natural places and wildlife, with 85% of those choosing loss of habitat as the greatest threat (Figure 19).

1.21.2.5 Building and installing nesting structures

Although providing nesting structures is not a form of conservation typically listed as an example of pro-environmental behaviour within academic surveys, 30% (N=1086) of question respondents identified this action as one in which they've participated. This form of habitat improvement by hunters specifically is identified by Heffelfinger et al. (2013), though without specific data to accompany the assertion. The type of nesting structure chosen likely depends on the native wildlife endemic to the area in which hunters live or recreate. Some common nesting structures could include nesting boxes for cavity dwellers such as wood ducks, kestrels, bats, and bluebirds, nesting tubes for mallard ducks, or even bee houses.

Further research on the species-specific nesting structures hunters build and install will help give further insights into the types of wildlife hunters support in this way, and if there is preference given to game versus non-game animals.

1.21.2.6 Nature education, species reintroduction, and landowner partnerships

Less than 25% of survey responses identified participation in nature or environmental education, reintroducing species, or partaking in landowner partnerships for habitat stewardship. Each of these actions occur under unique conditions for which most conservationists, hunters included, are least likely in a position to contribute. Due to narrow conditions in which these activities occur, they also may offer the least opportunity for new involvement.

1.21.2.7 Hunters viewed license purchases as helping conservation

Of the 98% of hunters who responded to the question of buying a hunting license or permit whether they intended to hunt or not, 90% selected 'yes/usually' and 7% selected 'sometimes' (Figure 17). The wording "whether hunting or not" was added to the question about purchase of hunting licenses to differentiate it from occurring strictly under required circumstances. It was the form of indirect conservation that garnered the greatest clear support of 'yes/usually' from survey participants overall. This aligns with findings of the National Fishing and Hunting Collaborative (2021) that notes hunters in Canada view themselves as contributors to conservation through the mechanism of hunting license purchases. In Canada and the United States, a portion of hunting license and permit sales helps fund wildlife conservation (Heffelfinger et al., 2013; Lessard et al., 2018), however, because these are legal requirements for most hunters¹⁷, they are not necessarily considered as evidence of support for conservation (Holsman, 2000).

If funds from license sales are designated partly or entirely to conservation, hunters may consider purchasing licenses, permits, or stamp validations to reliably dedicate funds to conservation. For example, migratory bird hunters in both Canada and the United States are federally regulated under the Migratory Bird Convention Act (MBCA) and Migratory Bird Treaty Act (MBTA) respectively and are required to purchase the "Duck Stamp" to hunt waterfowl and other migratory birds (Mahoney, 2019). 38% of survey respondents identified migratory bird hunting as one of the top 3 forms of hunting in which they participate, and it was also the third most popular form of hunting selected overall (Figure

¹⁷ Under some circumstances, Section 35 Rights Holders under the Canadian Constitution Act, 1982, are exempt from requiring a hunting license or permit (Boulé et al., 2021).

11). Proceeds from both the U.S. Migratory Bird Hunting Stamp and Canadian Wildlife Habitat Conservation Stamp, or “Duck Stamp” as it’s commonly called, fund an array of conservation projects (Ducks Unlimited Canada, 2019; U.S. Fish & Wildlife Service, n.d.), with most U.S. funds used to purchase and protect wetland and other migratory bird habitat (Vrtiska et al., 2013). Since their inception the stamps themselves have been created as collectible art, sometimes by notable artists such as Robert Bateman, throughout Canada and the U.S. (Environment and Climate Change Canada, 2024; U.S. Fish & Wildlife Service, n.d.; Wildlife Habitat Canada, n.d.).

While federal government agencies like the U.S. Fish & Wildlife Service and Environment and Climate Change Canada, and NGOs like Wildlife Habitat Canada provide general information about how funds from Duck Stamp purchases fund conservation, as well as attributing credit to hunters for their conservation support, a breakdown of how funds are specifically allocated is not as clear. In two surveys of waterfowl hunters in Illinois, Ahlers & Miller (2019) found that less than 1/3 of waterfowl hunters knew exactly how Duck Stamp funds were spent. However, a lack of knowledge about the specific allocation of funds is not the same as a lack of awareness that the Duck Stamp funds conservation generally, which was not a question included in their surveys. According to Rutter et al. (2022), waterfowl hunters in Missouri who hunted in wetlands were more likely to engage in conservation activities than other wetland recreationists (e.g., fishing, wildlife viewing), and 4.6 times more likely to participate in conservation compared to non-recreationists. The combination of clear, transparent reporting on how stamp purchases fund conservation, the public acknowledgement of the role of hunters in supporting conservation through stamp purchases, and the artistic collectible nature of the stamp unique to each year for which the stamp is issued, may result in hunters, waterfowl hunters in particular, purchasing the Duck Stamp voluntarily (i.e., whether they intend to hunt or not).

Other than the federal regulation of waterfowl and migratory game birds, hunting in Canada is regulated by provinces and territories. While revenue from license sales is allocated slightly differently in each jurisdiction, a percentage of revenue may be directly dedicated to conservation or may go to the jurisdictional government which apportions some to federal general revenue, and some to wildlife management agencies (Government of Alberta, 2024; Heffelfinger & Mahoney, 2019). For example, in

Ontario, where over 80% of survey respondents reside (Figure 4), the provincial government has made clear that 100% of revenue from hunting license sales goes into the provincial Special Purpose Account for fish and wildlife through which funds are dedicated to conservation and management of wildlife resources (Ministry of Natural Resources, 2014). Further research specific to each province or territory in Canada may reveal additional nuances about the purchase of hunting licenses as a form of supporting conservation.

The number of hunters in North America have been waning for several decades (Price Tack et al., 2018). This is a concern in both the United States and Canada. Fewer hunters means a reduction in dedicated conservation funding currently collected through licence purchases which otherwise doesn't have a reliably replaceable source, and because of the ripple effect of having less advocacy and support for conservation initiatives that are key to protecting habitats such as wetlands, among others (Mahoney, 2009; Vrtiska et al., 2013).

1.21.2.8 Hunters stated support for conservation through membership and subscription

The majority of respondents stated support for conservation through membership or subscription to conservation organizations (Figure 17). 98% of participants selected at least one organization they support as a member or subscriber (Figure 13). 66% of those identified support for national conservation organizations (Figure 14). Some of the national conservation organizations presented as options are aligned more closely with hunters than others, though all identify conservation of wildlife (some species-specific). The two national conservation organizations with most support selected were Ducks Unlimited Canada (DUC) with 26% of respondent support, and the Canadian Wildlife Federation (CWF) with 14% of respondent support. Both DUC and CWF are strongly devoted to conservation and protection of wildlife and their habitats, and both were among the top 3 specific organizations identified.

My results are supported by Teisl & O'Brien (2003), who found that among outdoor recreationist groups, hunters are most likely to support conservation organizations through membership or financial donation compared to other recreationists. A number of surveys have been conducted of waterfowl hunters in the United States with inconsistent findings. For example, Lessard et al. (2018) found that

only 19% of the 222 waterfowlers surveyed in Alabama were also members of a conservation organization, but Schroeder et al. (2021) found that almost 40% of the 1656 waterfowlers they surveyed in Minnesota reported to be members of DU. 1529 of hunters who responded to my survey reported hunting migratory birds and/or waterfowl (Figure 11). Future analysis of my results could include cross-tabulation of respondents who selected waterfowl hunting and also reported being members of DU and Delta Waterfowl for a more direct comparison between specific hunting type and stated membership in a conservation organization.

1.21.3 Political Actors Through a Conservation Lens

1.21.3.1 Voting for conservation

Most hunters stated they consider conservation a priority when voting (Figure 17). Regarding political orientation, 60% of survey respondents said they tend to vote Conservative (Figure 3). Close to the same number of respondents prioritize conservation when voting as the number of respondents who vote Conservative, though these may not be the same respondents. Further analysis in the form of cross-tabulation of results, which is outside the scope of analysis for this study, is needed before drawing any conclusions about if the tendency to vote for conservation aligns with political orientation or any other factors such as residence location.

Being politically conservative is not uncommon for hunters in North America (Love-Nichols, 2020), though voting tendency should not be conflated with partisan interest in conservation. Of the 97% of hunters who rated their feelings for the statement *“I’m only interested in participating in conservation with people who share the same political beliefs”*, 72% selected ‘Does not describe my feelings’, and 11% selected ‘Slightly describes my feelings’ (Figure 24). This result is encouraging for different groups of conservationists that might consider collaborating on a conservation project, and is a message to governments of various political stripes that conservation need not be used as a political bargaining tool.

1.21.3.2 Submitting comments to governments

The frequency of submitting written comments to government was almost evenly split between ‘no/rarely’ and ‘sometimes’. The evidence of this form of conservation practiced by hunters is limited, though low participation in submitting responses to government may result in hunters’ opinions being

underrepresented. Armitage et al. (2012) discuss the importance of including resource users in the suite of voices of environmental governance, or decision-making processes, that inform conservation outcomes.

Low participation in some forms of conservation should not be conflated with a lack of interest in conservation, since there may be other factors that influence the decision about whether to participate. Among hunters in British Columbia, Boulé et al. (2021) found a degree of distrust with government decision-making and skepticism about changes to hunting regulations because claims of how the changes would improve conservation did not appear to be based in evidence. A lack of trust in governments using evidence to inform conservation decisions may not be specific to hunters. As part of an international opinion survey of conservation professionals, Rose et al. (2018) found that conservation not being a political priority rated among the top 5 barriers to conservation policy being informed by evidence.

Hunters' confidence that their opinions will be equitably considered may be lacking, or a general distrust of government or the process by which policies are created, may be contributing factors for low participation in this form of conservation. Further exploration about circumstances under which hunters do write comments, and conversely why they don't, should be undertaken before drawing any definitive conclusions.

1.21.3.3 Influence through organizations

Heffelfinger et al. (2013) note that hunters and hunting organizations exert political effort to advocate for protection of wildlife habitat that is under threat. While they note this type of advocacy typically falls to organizations who often have the internal capacity to engage, they also note hunters will engage in letter writing or other advocacy for issues they feel are of concern. Survey respondents rated letter-writing to government about conservation as infrequent (Figure 17) which may be influenced by the frequency with which they have serious concerns about conservation issues to direct to government.

It is well documented that hunting-conservation organizations in both Canada and the U.S. financially contribute to habitat and wildlife conservation endeavours (Arnett & Southwick, 2015). While Holsman

(2000) recognizes this is the case, he asserts that only a minority of hunters are members of conservation organizations such as DU. First, a minority of less than 50% need not be inconsequential. Just over one quarter of question respondents claimed to be members of DU, and the majority of respondents identified membership in at least one national conservation organization (Figure 13). I recognize this may be a result of the sample from which I drew, since the survey was distributed to hunters who were mostly already members of provincial and territorial hunting conservation organizations and as such, they may be more inclined to be members or supporters of other organizations.

Support for these organizations may be viewed in part by hunters as supporting conservation. The two greatest barriers to participating in conservation according to hunter responses were not having extra funds (N=1785) or time (N=1660), yet 3,934 respondents stated to be members of an organization. OFAH, as well as the other provincial and territorial organizations that are affiliated with the CWF, promote conservation and responsible, sustainable use of, and equitable engagement with, wildlife. Cooke et al. (2016) recognize that NGOs in Canada, including those that are oriented to hunters, engage with a segment of society that is interested in conservation outcomes.

While it is hard to argue that support for organizations like DU and CWF is not about conservation, it's possible that conservation is not the driver of membership in provincial or territorial organizations. Because of their jurisdictional alignment with provincial and territorial governments, jurisdictional organizations are often included as stakeholder representatives in government policy discussions that impact hunters, with conservation being one of a suite of issues. There are also a range of benefits that are associated with provincial and territorial organizational membership. Many of these organizations, including OFAH, offer insurance as part of membership benefits, as well as provide a wealth of information through their websites, publications, and in-person courses or clinics that help educate and offer skills improvement. Additionally, membership may offer a way to stay connected within a community of hunters. 98% of survey respondents, for example, reported being associated with other hunters (Figure 8).

1.21.4 Hunters as Allies for Conservation

In addition to survey questions that addressed specific conservation behaviours, several other questions aimed to provide a deeper understanding of what hunters think and feel about nature and conservation were asked. Responses to these questions may help provide context for the types of conservation reportedly practiced by hunters.

1.21.4.1 Hunters stated they donated to conservation fundraising

Conservation NGOs employ a range of fundraising strategies. Some provide opportunities to donate money directly to their organization or specific programs, and there are also fundraising events for which prizes, for example, can be donated. For this type of support, I also expected the clearly affirmative response to be higher, though the greatest barrier to participating in conservation was cited as not having extra funds or resources (Figure 18). The results for this statement provide a contrast to results from Figure 17, for which 90% of statement respondents clearly affirmed they purchase a hunting license or permit whether hunting or not. Further exploration of the types of donations hunters make to conservation, and under what circumstances, will help increase understanding of this form of conservation, and may help conservation organizations cater fundraising efforts to hunters more effectively.

1.21.4.2 Hunters indicated they support their friends and family in conservation activities

Most respondents indicated they support friends and family in conservation activities (Figure 17). Just over 98% of survey participants said they have family, friends, and/or acquaintances that are hunters (Figure 8), and 82% consider themselves conservationists (Figure 10). Most respondents think it's both important for all hunters to participate in some form of conservation (Figure 22), and said they care about conserving all species and habitats (Figure 23).

1.21.4.3 Hunters may be overlooked as conservation allies

Most hunters don't have a career or job focused on conservation. Roberts et al. (2018) note a changing trend in the demographics of people working in the field of wildlife management in North America as moving away from those with a background in hunting or other forms of harvest (i.e., fishing, trapping). It would be helpful to know what percentage of those working in the conservation sector in Canada are also hunters, what types of careers they have (i.e., do they work in the non-profit sector, for government, or in another field such as research), and the degree to which they have decision-

making authority or influence on issues that impact both hunting and conservation. Of the 97% of hunters who rated the extent of truth to the statement *“hunters are well understood by non-hunters involved in conservation”*, 63% said this was ‘rarely’ true, and 17% said this was ‘sometimes’ true (Figure 21). A similar trend in response numbers and choices is reflected in another survey question for which 98% of survey respondents answered. When asked how often it is true that hunters’ perspectives are adequately included in conservation decision-making, 38% said ‘rarely’, and 45% said ‘sometimes’ (Figure 21).

Chapter 6

Conclusion

There is a large body of literature that addresses hunters and conservation in the context of sustainable hunting and the North American Model of Wildlife Conservation (Geist & Mahoney, 2019; Heffelfinger et al., 2013; Paulson, 2012). Beyond the sustainability of regulated hunting, very little empirical research exists that addresses the ways in which hunters perceive and contribute to conservation. The majority of peer-reviewed literature about conservation in general reflects differences in conservation philosophy (Table 1), or focuses on theoretical frameworks (e.g., CNS and NEP) to identify and categorize attitudes and values in order to predict likely conservation behaviours, yet the perceptions and behaviours of hunters directly are not well studied.

Using attitudes to predict behaviour may be a convenient approach for wildlife managers with limited time and resources (Lessard et al., 2018). However, Nilsson et al. (2020) point out that since attitudes are not a reliable predictor of behaviour, and influences on behaviour are complex, identifying conservation behaviours of defined interest groups (hunters in this case) can result in stronger and more reliable evidence to inform conservation approaches and ultimately outcomes. As was reflected in Chapter 2, the latter information is lacking. I found no empirical peer-reviewed research conducted solely with hunters in Canada about their participation in conservation activities from which to draw or compare. Existing research at best includes hunters as one of several groups in a study or addresses a range of topics related to hunting and hunters, of which conservation is only a part (e.g., Federal, Provincial, and Territorial Governments of Canada, 2014; National Fishing and Hunting Collaborative, 2021; The Conference Board of Canada, 2019).

Additional research about hunters in Canada is needed. Studies that address conservation actions taken by hunters in or inclusive of Canada (i.e., North America) are scant and/or non-empirical, with the vast majority of research about hunters in North America situated in, and reflective of, hunters, wildlife conservation, and management approaches in the United States. This may be especially problematic if conservation decision-makers, practitioners, and governments rely on potentially inaccurate information about what hunters in Canada do, think, and feel about conservation. There is

arguably overlap in the post-colonial development of hunting and conservation cultures between Canada and the United States, particularly in the late 19th through the 20th centuries (Sandlos, 2013). However, Canada has its own unique and independent history and systems of government and governance, as well as cultures and languages that continue to evolve distinctly apart from the United States. It is thus important to explore issues around hunting and conservation in Canada separately from hunting and conservation in the United States. Much more Canadian research needs to be conducted in this respect to address this significant gap.

The findings of this research offer a message of hope for better achieving conservation outcomes. My exploratory research sought to answer the question “do hunters in Canada perceive they contribute to conservation, and if so, in what ways?”, and the answer, based on hunter responses, was an overwhelming “yes”, with numerous forms of conservation actions reported. Asking a range of questions about what hunters do, think, and feel about conservation specifically, and about wildlife and nature generally, provided insight and a better understanding about hunters in Canada. Participants identified as conservationists more strongly than as hunters and engage in a range of nature-based outdoor activities in addition to hunting. They participate in and support a range of conservation activities, including habitat enhancements, mentoring, volunteering, purchasing hunting licenses or permits whether they intend to hunt or not, being members of conservation organizations, and making voting choices that prioritize conservation. Most hunters are willing to collaborate for conservation with people of different political beliefs than their own, and feel they have skills and knowledge to contribute. A lack of time and money are barriers to their greater participation in conservation.

From an academic research perspective, this study may be the first of its kind in Canada, and may spark interest of and ideas for current and upcoming researchers to pursue about relationships between nature-based outdoor recreationists and conservation. Researchers in Canada especially have an opportunity to contribute to a body of knowledge that is significantly lacking. From a personal standpoint, my next steps involve analyzing text responses from the survey data and carrying out cross-tabulations to further explore relationships between response variables, as well as analyzing data from 12 semi-structured interviews.

These results offer opportunities for hunting-conservation organizations to consider how to better engage with their membership about conservation, and to elevate their focus on conservation-related topics reflected on their websites and in other forms of media. National conservation organizations such as Ducks Unlimited Canada, the Canadian Wildlife Federation, or other national ENGOs that are inclusive in their approaches to conservation are in a unique position to bring together hunters and non-hunters to collaborate for conservation. Maybe most importantly, non-hunting conservationists across all sectors should consider how to integrate hunters and hunter perspectives into conservation planning and decision making.

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Yukon Fish & Game Association. <https://www.yukonfga.ca/>

Appendix A – Information Letter

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Information Letter

Study Title: From the Mouths of Hunters: Towards A Better Understanding of the Relationship Between Hunters and Conservation Action in Canada

Faculty Supervisor: Dr. Stephen D. Murphy, School of Environment, Resources & Sustainability, Faculty of Environment, University of Waterloo. Phone: 1-519-888-4567 x45616, email: sd2murph@uwaterloo.ca

Student Investigator: Maya Basdeo, MES Candidate, School of Environment, Resources & Sustainability, Faculty of Environment, University of Waterloo. Phone: 1-289-442-6526, email: maya.basdeo@uwaterloo.ca

The following information is intended to help you make an informed decision about if you would like to participate in this survey. This letter explains what the study is about, possible risks and benefits, and your rights as a research participant. You may print/save a copy of this letter for your records by clicking on the link at the bottom of the page. If you do not understand something in the letter, please contact Maya Basdeo using the contact information above, before consenting to participate.

What is the study about?

You are invited to participate in a Master's level research study that explores the relationship between hunters in Canada and conservation, from the perspective of hunters. As both a hunter and a conservationist herself, Maya Basdeo has an ongoing interest in the role hunters in Canada play in conservation projects and initiatives, and the ways in which hunter participation is communicated about in academic and non-academic material. Current academic literature about the relationship between hunting and conservation in Canada is limited and may not accurately represent hunters' views and actions concerning conservation.

The purpose of this research is to gain a more accurate understanding of how hunters in Canada view and engage in conservation by asking hunters directly. We plan to combine the results of this survey with interviews from expert hunter-conservationists in Canada, as well as existing academic literature about hunting and conservation in Canada.

What does participation involve?

Participation in the study will consist of an online anonymous questionnaire that takes approximately

10 minutes to complete. You will first be asked some demographic information such as age, cultural heritage, and residence location. The remaining questions ask about the kinds of hunting and conservation activities you do, and your opinions about conservation. With your permission, anonymous quotations from open-ended responses may be used in papers and publications that arise from this research project.

Who may participate in the study?

This survey is intended for residents of Canada who are at least 13 years of age and are currently a hunter or have been a hunter in the past as determined by licence, permit, course or other respective qualification in your province or territory, including those for youth and apprentice hunters. If you are a youth hunter or hunting apprentice between the ages of 13 – 17, please discuss your participation with a parent or guardian before completing the survey.

Is participation in the study voluntary?

Your participation in this study is voluntary. You may decline to answer any question(s) by selecting “prefer not to answer”, or by skipping to the next question. You may stop participating at any time by not submitting your responses and closing your web browser.

Will I receive anything for participating in the study?

You will not receive any remuneration or in-kind benefit in exchange for your participation in the study. Since the survey is anonymous, email addresses will not be collected. Once the project has been completed, survey results and research findings will be made available on the survey website.

What are the possible benefits of the study?

Participation in this study may not provide any direct personal benefit to you. The study will benefit the academic community and greater society in the following way(s):

- Reflect the perspectives and opinions of hunters in Canada who complete the survey, potentially correcting misconceptions about what hunters think and do about conservation.
- Fill an existing gap in academic and general literature about the relationship hunters in Canada have with conservation, thereby informing future students and researchers who are interested in hunting and/or conservation.
- Provide a clearer definition of ‘conservation’ according to contemporary hunters in Canada.
- Provide insight to hunting and conservation communities and organizations about how best to engage with hunters about conservation issues and reduce barriers for hunters to participate in conservation efforts in Canada.
- Identify/confirm areas of overlap between hunters and other conservationists where collaboration may occur.

What are the risks associated with the study?

There are no known or anticipated risks associated with participation in this study. If a question or the topic makes you uncomfortable, you can choose not to provide a response.

Will my identity be known?

Your participation in this study, and the data collected, is anonymous. This anonymous questionnaire will not ask for your name or other identifying information. Removing your responses later is not possible because the researchers will have no way of identifying which responses are yours. Any identifying information included in written responses will be removed or coded in a way to not reveal personal attributes.

How is data collected, stored, and protected?

The online survey you may choose to complete is operated by Qualtrics. Qualtrics software has implemented technical, administrative, and physical safeguards to protect the information provided via the Services from loss, misuse, and unauthorized access, disclosure, alteration, or destruction. However, no Internet transmission is ever fully secure or error free. Only the researchers identified above will have access to survey data. Collected data will be securely stored on password-protected computers for at least 1 year. With your permission the data that you provide in this study may be shared publicly without any names or other identifying information.

Has the study received ethics clearance?

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Board (REB #####). If you have questions for the Board, contact the Office of Research Ethics, toll-free at 1-833-643-2379 (Canada and USA), 1-519-888-4440, or reb@uwaterloo.ca.

Who should I contact if I have questions regarding my participation in the study?

If you have any questions about this study or need more information before you decide whether to participate, please contact Student Investigator Maya Basdeo at 289-442-6526 or by email at maya.basdeo@uwaterloo.ca.

Appendix B – Survey Questions (English)

[\[take me back to Questionnaire paragraph\]](#)

Targeting Conservation: A Hunter Survey

Informed Consent

I acknowledge I have read the above information letter. I understand the survey is anonymous, and that once submitted it will not be possible to change or withdraw my responses because there is no way to identify me personally.

I understand my responses will contribute to information that may be included in papers and publications that arise from this research project.

By providing your consent, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

- ☐ I agree to participate in this study
- ☐ I do not agree to participate in this study

(Skip to end of survey if “I do not agree to participate in this study” is selected)

Do you permit the researchers to use anonymous quotations from any text responses you provide?

- ☐ Yes, my anonymous text responses may be quoted
- ☐ No, do not use any of my text responses

Demographic Questions

The first few questions about demographic information are intended to help provide a better understanding of the diversity among hunters in Canada. Your responses are entirely voluntary and anonymous. Answering these questions to the best of your knowledge may also help counter current misconceptions about who hunters are in Canada, since results will be made publicly available as part of this Master's research project.

1. What gender do you identify with?

- ☐ Male
- ☐ Female
- ☐ Two-spirit
- ☐ Prefer to self-identify (please specify)
- ☐ Prefer not to answer

2. What is your age range? (*Skip to question 5 if "Youth 13 – 17"*)

- ☐ Youth 13 - 17
- ☐ 18 - 30
- ☐ 31 - 45
- ☐ 46 - 65
- ☐ Over 65
- ☐ Prefer not to answer

3. What best describes your political affiliation or voting tendencies? Your response will remain anonymous.

- ☐ Non-partisan
- ☐ Primarily Bloc Québécois
- ☐ Primarily Conservative Party
- ☐ Primarily Green Party
- ☐ Primarily Liberal Party
- ☐ Primarily NDP Party
- ☐ Other (please specify)
- ☐ Prefer not to answer

5. In what province or territory do you live?

- ☐ Alberta
- ☐ British Columbia
- ☐ Manitoba
- ☐ New Brunswick
- ☐ Newfoundland & Labrador
- ☐ Northwest Territories
- ☐ Nova Scotia
- ☐ Nunavut
- ☐ Ontario
- ☐ Prince Edward Island
- ☐ Quebec
- ☐ Saskatchewan
- ☐ Yukon

4. What best describes the location of your residence?

- ☐ Urban (large city, population of over 100,000 people, abundant services and amenities)
- ☐ Suburban (primarily residential municipality, less than 100,000 people, within reasonable commute to large city)
- ☐ Rural (rural postal code, has limited services, not within reasonable commuting distance to large city)

- ☐ Remote (rural postal code, has limited to few or no services, access by air, water, ice road or remote gravel road)

6. Do you identify as an Indigenous person (First Nation, Inuit, Métis)? *(Skip to question 8 if “No”)*

- ☐ Yes
- ☐ No

7. Do you identify as (select all that apply):

- | | |
|--|---|
| ☐ First Nation - status | ☐ Inuit/Inuk |
| ☐ First Nation - non-status | ☐ Métis |
| | ☐ Prefer not to answer |

8. What best describes your cultural background or heritage? Select all that apply.

- | | |
|--|---|
| ☐ Indigenous from Canada | ☐ Middle Eastern |
| ☐ Indigenous from outside of Canada | ☐ African |
| ☐ Québécois | ☐ East Asian |
| ☐ Canadian | ☐ South Asian |
| ☐ Caribbean | ☐ Oceanian |
| ☐ Eastern / Northern European | ☐ Other (please specify) |
| ☐ Western European / United Kingdom | ☐ Prefer not to answer |

Behaviour Questions

9. Are you currently a hunter, or have you hunted in the past? *(Skip to question 11 if "Yes")*

- ☐ Yes
- ☐ No

10. Are you likely to become a hunter in the future?

- ☐ Yes
- ☐ No

11. Do you have family members, friends or acquaintances that hunt?

- ☐ Yes
- ☐ No

12. Do you consider being a 'hunter' to be part of your identity?

- ☐ Yes
- ☐ Somewhat
- ☐ No

13. Do you consider being a 'conservationist' to be part of your identity?

- ☐ Yes
- ☐ Somewhat
- ☐ No

14. What best describes the type of hunting you do or have done most often? Select up to 3 choices.

- | | |
|---|--|
| ☐ Bear | ☐ Falconry |
| ☐ Big Game (bighorn sheep / mountain goat) | ☐ Small Game (upland birds) |
| ☐ Big Game (caribou) | ☐ Small Game (mammals) |
| ☐ Big Game (deer / moose) | ☐ Turkey |
| ☐ Canids (coyote / wolf) | ☐ Migratory Birds / Waterfowl |
| | ☐ Other (please specify) |

15. Do you eat what you harvest? Select the answer that applies most often.

- ☐ Yes, I eat what I harvest
- ☐ I partially eat what I harvest and donate some to food banks or people in need
- ☐ I eat what is harvested by others
- ☐ No, I donate all of the edible harvest
- ☐ No, I use only the fur and other parts of the animal
- ☐ Prefer not to answer

16. Which of the following hunting and / or conservation organizations do you support through either membership, subscription or donation? Select all that apply.

- | | |
|--|--|
| ☐ Alberta Fish & Game Association | ☐ New Brunswick Wildlife Federation |
| ☐ BC Wildlife Federation | ☐ Newfoundland and Labrador Wildlife Federation |
| ☐ Canadian Wildlife Federation | ☐ Nova Scotia Federation of Anglers & Hunters |
| ☐ Canadian Wild Turkey Federation | ☐ Northwest Territories Wildlife Federation |
| ☐ Delta Waterfowl | ☐ Ontario Federation of Anglers & Hunters |
| ☐ Ducks Unlimited | ☐ Pheasants Forever Canada |
| ☐ Fédération Québécoise des chasseurs et pêcheurs | ☐ Prince Edward Island Wildlife Federation |
| ☐ Local hunting / angling club | ☐ Quality Deer Management Association |
| ☐ Local naturalist / nature club | ☐ Saskatchewan Wildlife Federation |
| ☐ Manitoba Wildlife Federation | ☐ World Wildlife Fund Canada |
| ☐ Nature Canada | ☐ Yukon Fish & Game Association |
| ☐ Nature Conservancy of Canada | ☐ Other (please specify) |

17. What types of nature-based recreation do you participate in other than hunting?

- | | |
|---|---|
| ☐ Bird watching | ☐ Foraging wild foods |
| ☐ Bushcraft | ☐ Gardening |
| ☐ Camping | ☐ Hiking / Backpacking |
| ☐ Canoeing / Kayaking / Paddling | ☐ Other activity not listed above (please specify) |
| ☐ Fishing | |

18. In which of the following conservation activities have you participated?

- ☐ Volunteer for a conservation project / organization
- ☐ Make property wildlife-friendly
- ☐ Participate in habitat restoration
- ☐ Participate in species reintroduction
- ☐ Participate in nature / environmental education
- ☐ Mentor others in conservation practice / ethics
- ☐ Build / install nesting structures
- ☐ Landowner partner in habitat stewardship (e.g. NCC, DU, ALUS)
- ☐ Other (please specify)

19. Which of the following do you do as a way to support conservation?

	No / rarely	Sometimes	Yes / usually
Support friends, family members or significant other in conservation activities	☐	☐	☐
Member of / subscriber to conservation organization	☐	☐	☐
Purchase hunting licenses, permits, and / or migratory bird stamps whether planning to hunt or not	☐	☐	☐
Write letters / submit comments to government(s) in support of conservation	☐	☐	☐
Vote for political parties / individuals that appear to prioritize conservation	☐	☐	☐
Choice of career / job has or had a focus on conservation	☐	☐	☐
Donate money or materials to conservation fundraising	☐	☐	☐

Opinion Questions

20. What are current or potential barriers to your participation in conservation activities? Check all that apply.

- | | |
|--|---|
| ☐ Not interested in conservation | ☐ Don't feel knowledgeable enough |
| ☐ Not a priority | ☐ Do not have access where I live |
| ☐ Too busy / don't have time | ☐ Do not feel welcome to participate |
| ☐ Don't have the extra funds or resources | ☐ Not sure where to begin |
| | ☐ Other (please specify) |

21. Which of the following do you consider to be threats to natural places and / or wildlife? Check all that apply.

- | | |
|--|--|
| ☐ Loss of / damage to habitat | ☐ Industrial development / operations |
| ☐ Climate change | ☐ Increased / expanded urban areas |
| ☐ Biodiversity loss | ☐ Over-harvest of natural resources |
| ☐ Invasive species | ☐ Illegal trade in wildlife |
| ☐ Intensive / large scale agriculture | ☐ Poaching |
| | ☐ Other (please specify) |

22. Do you think the regulated hunting by government-issued licence or permit in your province or territory is currently a threat to natural places or wildlife?

- ☐ Yes
- ☐ Somewhat
- ☐ No

23. In your opinion, how often are the following statements true?

	Never	Rarely	Sometimes	Mostly	Always
Hunters' perspectives are adequately included in decision-making about conservation initiatives	☐	☐	☐	☐	☐
Hunters are well understood by non-hunters involved in conservation	☐	☐	☐	☐	☐

24. To what extent do you agree with the following?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Hunting is an activity that is harmful to conservation	☐	☐	☐	☐	☐
Hunters have valuable knowledge and experience that can contribute to conservation	☐	☐	☐	☐	☐
It's important for all hunters to participate in some form of conservation as they are able	☐	☐	☐	☐	☐

25. How closely do the following statements describe your feelings about hunting and conservation?

	Does not describe my feelings	Slightly describes my feelings	Moderately describes my feelings	Mostly describes my feelings	Clearly describes my feelings
Hunting is a way for me to connect with nature	☐	☐	☐	☐	☐
I'm only interested in conserving the wildlife species I hunt	☐	☐	☐	☐	☐
I care about conserving all species and habitats	☐	☐	☐	☐	☐
I'm only interested in participating in conservation if it's with people that have the same political beliefs as I do	☐	☐	☐	☐	☐
I'm not interested in, or concerned about, conservation	☐	☐	☐	☐	☐

26. Is there anything else you'd like to add or clarify about your views or responses in this survey?
Please add any additional comments in the space below.

Appendix C – Ethical Approval

[\[take me back to Ethical Approval\]](#)

PROTOCOLS



#44598 - From the Mouths of Hunters: Towards A Better Understanding of the Relationship Between Hunters and Conservation Action in Canada

Protocol Information

Review Type	Status	Approval Date	Renewal Date
Expedited	Approved	Oct 10, 2023	Sep 18, 2024
Expiration Date	Initial Approval Date	Initial Review Type	
Oct 11, 2024	Oct 10, 2023	Expedited	

Feedback

Approval Comment

This study has received ethics clearance. If you have any questions please contact Karen Pieters at karen.pieters@uwaterloo.ca.

General Information

Only the Principal Investigator/Faculty Supervisor can submit the application. This acts as a signature indicating approval of the application.

Principal Investigator / Faculty Supervisor

Stephen Murphy

Department

School of Environment, Resources and Sustainability

Waterloo Department

School of Environment, Resources and Sustainability

Email Address

sd2murph@uwaterloo.ca

Phone**Researcher Role**

Principal Investigator

Permissions

Full Access

Mandatory Training

All University of Waterloo undergraduate and graduate students, faculty, and staff must complete the [TCPS 2 CORE tutorial](#) prior to submitting an application for review. See [instructions](#) or email researchethics@uwaterloo.ca if you have questions.

REQUIRED: Upload a copy of the TCPS 2 certificate or a screen shot showing module completion. Applications where the certificate/screen shot is not uploaded will be sent back to the researcher and not reviewed.

[TCPS2_CORE_CERTIFICATE.PDF](#)

As per the Waterloo policy on [mandatory research ethics training](#), if you completed the TCPS2 tutorial more than 5 years ago, you may be asked to update your training within the next 6 months. You will be notified by email if this is the case.

Study title

From the Mouths of Hunters: Towards A Better Understanding of the Relationship Between Hunters and Conservation Action in Canada

General Questionnaire

Indicate the type of application you would like to complete

Standard application *

* The Standard application is for faculty level research and thesis level research.

** The course project application is for single-term (non-thesis) course based research and can be completed by students or the course instructor

Please confirm:

I understand that the type of applications listed above determine the form I am about to complete. If I have chosen the incorrect form I acknowledge that I may need to complete a new application.

People**University of Waterloo research team**

Ensure all information in this table is completed.

Person

Stephen Murphy

Do you have any investigators external to the university or Waterloo?
No

General details

2024-04-10, 1

<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3e>

Is this new study related to any previous application?

No

What is the estimated start and end date for the study?

Start Date (Date you anticipate beginning the recruitment of participants)

October 12, 2023

End Date (Date you expect the study will end, for example, the date when there will be no further contact with participants or when the data analysis will be completed for US funded research)

December 8, 2023

Does this research require approval from a UWaterloo departmental committee?

Yes, received approval

Department approval date

August 26, 2023

What is the level of the research to be conducted? Choose one.

Master's thesis

Will this study involve Wilfrid Laurier University, Western University, Conestoga College or Local hospitals covered by the Tri-Hospital Research Ethics Board (Cambridge Memorial Hospital, Grand River Hospital and St. Mary's General Hospital)?

No

Has a version of this study been disapproved or rejected by any Research Ethics Board/Committee?

No

Study description

State your research question(s)

Do hunters in Canada contribute to conservation efforts, and if so, in what ways?

Provide a clear, detailed description of the purpose, hypothesis, aim, and objectives of this study

The purpose of this research is to address gaps in academic and grey literature and possible misunderstandings about the relationship hunters in Canada have with nature conservation. My hypotheses are that a) a majority of hunters in Canada value and contribute to nature conservation, b) there are specific types of conservation activities in which hunters tend to engage, and c) there may be barriers to hunter participation in conservation initiatives when directed by non-hunters or non-hunting organizations. The aim of this study is to give hunters in Canada the opportunity to speak for themselves about if and how they contribute to conservation, and what they consider conservation concerns to be. The objective of this research is to contribute to overall conservation policy, strategy and goals in multiple sectors and jurisdictions in Canada. Efforts to conserve biological diversity are failing at multiple scales in Canada. Hunters as a group may be an underutilized resource for conservation funding, expertise and effort that are not recognized as a resource because the activity of hunting itself is often assumed to be detrimental to nature. This research will result in the development of recommendations for further research about hunting and conservation in Canada, and provide applicable, tangible suggestions about circumstances under which hunters in Canada are most likely to contribute to conservation.

Provide background information, a rationale, and justification for conducting this study. Describe why the research is being done and what research has already been done in this area. Be sure to explain why this research is important.

Background - Academic research focusing on the relationship between nature-based outdoor recreation and environmental values in a North American context gained traction in the late 1960s and early 1970s. Academic and grey literature during this time presented the activity of hunting as "consumptive" and "utilitarian": assumptions that became entrenched and which may have contributed to the idea that hunting is detrimental to nature and that hunters don't value or contribute to conservation. Rationale & justification - Hunters as a group have been largely excluded as participants in original research about conservation, and what little academic research has been done has occurred with much smaller numbers of hunters in limited geographic areas smaller than state (U.S.), provincial or territorial areas. Existing literature about environmental values, attitudes, beliefs, or contributions to conservation has consistently recommended a focus on specific activities and associated groups of people. This research is important because it will be the first academic study of its kind in Canada on the topic of conservation that specifically focuses on hunters as participants. It is national in scale, is specific to hunters, and the estimated number of participants is considerably larger than any study involving hunters published in North America so far.

In a maximum of 250 words, provide a non-scientific lay language description that summarizes the project outlining the purpose, anticipated benefits, and basic procedures. Write this summary as if it would be read by members of the general public who are not familiar with academic terms or acronyms. Use language suitable for a media release.

Conservation of biodiversity and natural resources has been a growing concern in Canada for decades, but efforts are failing. Collaboration between different groups of people, organizations and levels of government is key to achieving conservation success. Understanding how different groups of people in different regions of the country value and contribute to conservation is key to informing successful collaboration for conservation. The purpose of this study is to explore how hunters in Canada view, and engage in, conservation actions. There are several anticipated benefits resulting from this study. The topic of hunting and conservation in Canada is understudied, and this research will contribute to a gap in general knowledge and offer recommendations for additional research. Insights about how hunters view conservation can help hunting and conservation communities and organizations determine areas for collaboration and reduce barriers for hunter participation. Hunters will be given the opportunity to voice their opinions

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<https://uwaterloo.kuali.co/protocols/protocols/652554b0cb>

and experiences about conservation. Information will be gathered directly from hunters in two ways: through a bilingual online survey with hunters in Canada, and through in-depth interviews with experts from provincial and territorial hunting-conservation non-governmental organizations. The survey responses will provide breadth on a number of conservation-related questions, and interviews will provide greater depth. Results will be integrated to provide a cohesive summary of how hunters in Canada view and contribute to conservation.

What is the study design?

This is a mixed-method study design that will use both qualitative and quantitative analysis of survey results, and qualitative analysis of semi-structured interview data.

Is this a pilot study?

No

Sample Size

What is the expected sample size? Outline the number of participants anticipated to take part in the study.

At least 60,000 people are expected to be invited to participate in the online survey. I expect a response rate of at least 5%, or 3,000 people across Canada. A minimum of 6 and maximum of 15 people will participate in semi-structured interviews.

Was a formal sample size calculation completed?

No

Provide a rationale for the number of participants specified

Survey - Six provincial hunting-conservation organizations in Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon have so far confirmed they will distribute the survey link through their respective email lists. 60,000 people being made aware of the survey is the minimum estimate based on the combined number of people that subscribe to email updates from participating organizations. Some organizations will also include the survey link on their website, share on social media, and/or distribute via a weekly newsletter. It is possible that additional provincial/territorial hunting-conservation organizations will opt to share the survey link once this project receives ethics approval and data collection begins. Since the survey is accessible online, it is likely that some people who receive the link will share it with their personal contacts who may not be members of provincial/territorial organizations. Any combination of these scenarios may result in a greater number than 3,000 responses and/or more than a 5% response rate. Semi-structured interviews - Each organization that opts to participate will be asked if 1 - 2 people in leadership roles, either staff or volunteer, are interested in participating in an interview. The six organizations have confirmed at least 1 person from their organization is interested and willing to participate in a virtual interview. Thus, 6 interview participants is the minimum number.

Study sites

Where is this study taking place?

Remote (online survey, virtual/telephone interview, etc.)

Please note that different guidelines/policies may apply when participants are recruited from certain locations.

Funding

Is the study funded/will it be funded?

Yes

Funding

List all funding sources that are new or ongoing

Funding status

Ongoing funding

Funding source is

Internal UWaterloo funding

Internal UWaterloo funding source

Murphy, S Faculty Support Returned Overhead

Program name if applicable

Work-order or award number, if known

10001-10262 202 2700 100

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<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3e>

Ensure all information in this table is completed.

Person

Maya Basdeo

Waterloo Department

School of Environment, Resources and Sustainability

Email Address

mnbasdeo@uwaterloo.ca

Phone

289-442-6526

Researcher Role

Student investigator

Permissions

Full Access

Mandatory Training

All University of Waterloo undergraduate and graduate students, faculty, and staff must complete the [TCPS 2 CORE tutorial](#) prior to submitting an application for review. See [instructions](#) or email researchethics@uwaterloo.ca if you have questions.

REQUIRED: Upload a copy of the TCPS 2 certificate or a screen shot showing module completion. Applications where the certificate/screen shot is not uploaded will be sent back to the researcher and not reviewed.

[TCPS2_CORE_CERTIFICATE_2022.PDF](#)

As per the Waterloo policy on [mandatory research ethics training](#), if you completed the TCPS2 tutorial more than 5 years ago, you may be asked to update your training within the next 6 months. You will be notified by email if this is the case.

What is the expected period of funding

Funding from

October 12, 2023

Funding to

December 12, 2023

Conflict of interest

Are there any potential, perceived, or actual financial or non-financial conflicts of interest of the research team in undertaking the proposed research?

No

Benefits

Are there direct benefits of the proposed research to the study participants?

No

What are the scientific and/or scholarly benefits of the proposed research?

Published academic literature about a) hunters in Canada and, b) their role in conservation is limited. The proposed research is the first academic study concerning hunters and conservation that has a national scope. Hunters and the activity of hunting is not typically associated with conservation, and this research has the potential to discover insights that could benefit conservation initiatives nationally or in regions of Canada. Because hunters in Canada are an understudied group, exploration of hunter perspectives supports an inclusive, diverse approach in considering biodiversity conservation. In addition to addressing gaps in academic literature, results of this research can be incorporated into environmental management and governance regimes by NGOs and various government agencies. The proposed research is exploratory, and findings may inform new scientific research about hunting, biodiversity conservation, and outdoor recreation. The proposed research has a focus on one subset of outdoor recreationists, which addresses recommendations made by previous researchers in this field. Finally, the research design can be adapted for exploration of conservation opinions and practice for other outdoor recreation groups in Canada and elsewhere.

Participants

Participant general categories

Youth (age 13 to 17 years)

Adults (age 18-64 years)

Older adults (age 65 +)

Describe the sample in detail and list any specific inclusion/exclusion criteria for the study

Survey - The survey is for residents of Canada who are at least 13 years of age and currently hunt or have hunted in the past. The inclusion criteria is based on the experience of hunting, rather than holding a license or permit for several reasons: - Hunting regulations are determined by provinces and territories. Some of these jurisdictions require a 'license', and others require a 'permit'. - Section 35 of the Constitution Act, 1982, affirms Aboriginal Rights, including the right to hunt. In some contexts, individuals that are First Nation, Inuit or Métis may hunt without a license, but could provide valuable insights about conservation from a hunter's perspective. Being inclusive of hunting 'experience' rather than 'licensed hunters' incorporates a decolonizing approach. - The sample may include people who hunted previously but may not hold a current or valid license or permit due to Aboriginal title, age, proximity to hunting locations, or other conditions. These people are included because the survey correlates their experience as a hunter with their perspectives and experience about conservation. - Hunting by youth under the age of 13 may take place in some jurisdictions or traditional Aboriginal contexts in Canada, however, all jurisdictions in Canada have a category of youth license or permit by the age of 13. The number of youth under the age of 13 that have experience hunting, have consideration for and interest in conservation, and that also receive the survey link is likely to be minimal and their exclusion is not expected to have a bearing on the survey results. Semi-structured interviews - The interviews are for residents of Canada that are considered experts and/or have leadership roles in provincial or territorial hunting-conservation organizations.

If you are excluding people on certain characteristics provide a justification for the exclusion.

People under the age of 13 are excluded because not all jurisdictions offer hunting licenses/permits to people under the age of 13.

Will a screening process be used to determine eligibility in the study based on the inclusion and/or exclusion criteria identified above?

No

Recruitment

2024-04-10

<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3>

Identify from where/what sources potential participants will be recruited.

Through email/internet (e.g., social media networks)
Businesses, NGOs or Government Offices

Indicate what email listing, internet site or network you intend to recruit from

None.

Identify the business, NGO or government offices that you will be recruiting from

The student investigator will be reaching out to affiliate organizations of the Canadian Wildlife Federation (CWF) using the Ontario Federation of Anglers & Hunters as the initial point of contact to distribute the survey link to their respective membership and/or email lists, via newsletter, and/or post the survey link to their website - in whatever manner works best for them. She will ask that each affiliate organization provide 1 - 2 'experts' or senior leadership (either staff or volunteer) to participate in a semi-structured interview. A number of CWF affiliate organizations have expressed initial interest in participating as described. They are: Ontario Federation of Anglers & Hunters - <https://www.ofah.org/> Manitoba Wildlife Federation - <https://mwf.mb.ca/> Saskatchewan Wildlife Federation - <https://swf.sk.ca/> Alberta Fish & Game Association - <https://www.afga.org/> B.C. Wildlife Federation - <https://bcwf.bc.ca/> Yukon Fish & Game Association - <https://yukonfga.ca/> Affiliate organizations from Northwest Territories, Nunavut, Quebec, Newfoundland & Labrador, Nova Scotia, New Brunswick, and Prince Edward Island may opt to participate once the study receives Ethics approval. We will not have direct access to the email or contact lists of the organizations. The email script (attached) reflects wording that will be used by organizations (pending Ethics edits/approval) who have agreed to distribute the survey link.

What recruitment materials will be used? See [sample recruitment materials](#).

Email script
Website

Describe how the website will be used for recruitment

The website will be used for indirect recruitment and access to the survey link. It provides information about the survey portion of the study, and will provide some of the survey results in the form of summaries and infographics once analyzed and approved by the graduate committee. The online survey was created using Qualtrics. While direct recruitment will occur through the specified organizations, these organizations will be distributing the link to the Qualtrics survey, and not the survey itself. There is nothing to stop recipients from sharing the survey link via email or through their social media. Potential participants that are not on an email list or members of the identified organizations may become aware of the survey and want more information or want access to the survey. The survey website will allow hunters in Canada who are not members of provincial or territorial organizations to participate in the survey, and will assist in managing information (i.e., FAQs located on the website will reduce the potentially high volume of email questions). Here is a link to the unpublished website that will allow for comments directly on the website: <https://wix.to/7k2IEH4?>

Describe how social media will be used

Some organizations may wish to post the survey link to their social media instead of, or in addition to, sending the link via email. Draft posts for those organizations wishing to post to social media have been prepared and are attached below. Only text approved by Ethics will be used by these organizations.

Upload your recruitment materials

Upload your recruitment materials SURVEYINVITE_SOCIALMEDIA_VERSION1_20230719.PDF Study group Survey participants
Upload your recruitment materials SURVEYINVITE_EMAIL_V4_20231010.PDF Study group Survey participants
Upload your recruitment materials INITIALRECRUITMENT_CWFORGANIZATIONS_VERSION3_20231009.PDF Study group CWF affiliate organizations

Upload your recruitment materials

WEBSITERECRUITMENTTEXT_V2_20231010.PDF

Study group

Survey participants

Upload your recruitment materials

INTERVIEWINVITE_EMAIL_V3_20231010.PDF

Study group

Interview participants

Will potential participants be recruited through pre-existing relationships with members of the research team (e.g., employees, students, or patients of research team, acquaintances, own children or family members, colleagues, etc.)?

No

Are potential participants in this study members of an organization that is taking part in this study (e.g., employees of a company, etc.)?

No

How will parents/guardians be contacted to invite their child to participate in this study?

The survey link will be shared with members of organizations that have opted to be on an email list. Members are adults. If members have children that are legally old enough to hunt but under the age of 18, they may opt to share the survey link with their child once reviewing the survey. It's possible some people under the age of 18 may become aware of the survey through social media, friends or family members. The Survey Information Letter advises potential participants under the age of 18 to discuss the survey with their parent or guardian before proceeding to take the survey.

Methods and procedures

Which of the following will be conducted for this study?

Surveys/questionnaires

One-on-one interviews

How will the survey(s) or questionnaire(s) be administered?

Email
Online or web

Provide the URL of the survey, if available

[https://uwaterloo.yul1.qualtrics.com/jfe/preview/previewId/2d8b2d0d-ed77-4796-a6f8-c60726e8eae8/SV_dpqiOyf1YvLpV6C?](https://uwaterloo.yul1.qualtrics.com/jfe/preview/previewId/2d8b2d0d-ed77-4796-a6f8-c60726e8eae8/SV_dpqiOyf1YvLpV6C?Q_CHL=preview&Q_SurveyVersionID=current)
Q_CHL=preview&Q_SurveyVersionID=current

How will the one-on-one interviews be conducted?

Online – Video Chat

Will quotations be used in the write-up of the study

Yes

What type of quotations will be used?

Anonymous

For each of the procedures indicated above, provided a detailed, sequential description of how they will be used in the study. Provide one or more paragraphs describing how you are recruiting participants, obtaining consent, what participants are asked to do, and how the research team will be using the collected data.

1. Recruitment for Study - provincial and territorial hunting-conservation organizations that are affiliated with the Canadian Wildlife Federation will be contacted via email by the Executive Director of the Ontario Federation of Anglers & Hunters on our behalf and invited to participate in this study by: a) sharing the Qualtrics survey link using a method of their choice (email to members/subscribers, posting on social media, including in newsletter) and, b) inviting ALL people in leadership or expert roles, and thus knowledgeable about both hunters and conservation, from their organization to participate in a semi-structured one-on-one interview. ADDED OCT 2, 2023: MAYA WILL SEND AN INTERVIEW RECRUITMENT EMAIL THAT EACH ORGANIZATION CAN FORWARD TO ELIGIBLE INTERVIEW CANDIDATES. THOSE PEOPLE INTERESTED IN PARTICIPATING IN AN INTERVIEW CAN THEN GET IN TOUCH WITH MAYA DIRECTLY. THE RESPECTIVE ORGANIZATIONS WILL NOT BE ADVISED BY THE RESEARCHERS ABOUT WHO, IF ANYONE, OPTED TO PARTICIPATE IN AN INTERVIEW. THE EMAILS WILL LIKELY BE FORWARDED TO MORE THAN 2 ELIGIBLE PARTICIPANTS. INFORMATION THAT COULD EASILY IDENTIFY RESPONDENTS WILL BE STRIPPED FROM QUOTATIONS (E.G., NAMES, PLACES, REFERENCES TO SPECIFIC ORGANIZATIONS OR OTHER UNIQUELY

IDENTIFYING CHARACTERISTICS). SINCE INTERVIEW PARTICIPANTS MAY BE SITUATED IN VARIOUS DIFFERENT PARTS OF CANADA, AND ORGANIZATIONS WILL NOT BE INFORMED WHO HAS PARTICIPATED AND FROM WHERE, IT'S EXPECTED THAT INTERVIEW PARTICIPANTS WILL EASILY BE KEPT ANONYMOUS. 2. Surveys - for organizations that agree to distribute the survey: a) The Qualtrics survey link will be provided along with approved text to use for distribution via email, newsletter and/or social media, as well as a closing date for the survey. The survey will be open for 2 - 3 weeks depending on when Ethics approval is received. The closing date will be confirmed once the study is approved. b) The information and informed consent letters are embedded in the Qualtrics survey and appear once the link is opened and before respondents have access to questions. Participants have the option to agree or disagree with the informed consent. If they disagree, the survey ends. If they agree, they may proceed with the survey. ADDED OCT 2, 2023: PEOPLE WILL BE ASKED TO PARTICIPATE IN A SURVEY THAT TAKES LESS THAN 15 MINUTES TO COMPLETE. PARTICIPANTS WILL BE ASKED SOME BASIC DEMOGRAPHIC INFORMATION, AND QUESTIONS ABOUT THEIR PARTICIPATION IN AND THOUGHTS ABOUT HUNTING AND CONSERVATION. c) Survey responses will be recorded directly in Qualtrics. 3. Interviews - conducted with individuals from CWF affiliate organizations a) The Information Letter will be sent to organizations that have indicated interest in participating in the semi-structured interview. b) 1 - 2 individuals will be identified by the organization and the method of initial contact will be according to their preference: either the interview participants will contact the student investigator via email or phone, or the student investigator will contact the interview participant by email or phone to schedule the interview. c) Interviews will be scheduled based on the availability of participants and will use either ZOOM or Teams as the online platform, depending on the preference of each interviewee. The interview schedule is not dependent on the survey schedule or survey responses. The interviews are intended to take place using both video and audio, however in the event a participant is in an area with limited bandwidth or unstable internet, the interviews will switch to audio only. d) Once confirmed, the informed consent and interview guide will be shared with each participant one week prior to the interview to allow time to review and consider participation and responses to questions. e) The interview will be audio recorded. f) Otter.ai will be used to transcribe the audio recording in real time as it integrates with both ZOOM and Teams. g) The student investigator will review each transcript for spelling, grammar, and completeness, and then send it to the interviewee to review for accuracy, correctness, and the option of striking any portion of the interview from the transcript. ADDED OCT 5: h) INTERVIEWS ARE EXPECTED TO TAKE BETWEEN 45 AND 75 MINUTES. i) THE TOPICS DISCUSSED WILL FOCUS ON CONSERVATION - HOW CONSERVATION IS VIEWED AND DEFINED BY PARTICIPANTS AND BY HUNTERS IN GENERAL, WHAT SITUATIONS OR CONDITIONS MIGHT LEAD TO GREATER PARTICIPATION BY HUNTERS IN CONSERVATION EFFORTS, AND WHAT BARRIERS MIGHT EXIST TO HUNTERS PARTICIPATING IN CONSERVATION. THE INTERVIEW GUIDE ADDRESSES THESE QUESTIONS EXPLICITLY AND WILL BE USED TO FOCUS THE INTERVIEW DISCUSSION. The data collected will be analyzed for common themes, patterns, and insights about conservation from the perspective of hunters. Data will also be used by the student investigator in development of the Master's thesis, and to inform academic journal articles and conservation policy of non-government organizations. Revised Oct 9: ONCE PUBLISHED, the data may be used by other researchers to compare or inform other research about hunting and/or conservation. DATA WILL BE EXPORTED FROM QUALTRICS AND OTTER.AI AND STORED ON A SECURE UWATERLOO ONEDRIVE FOR ONE YEAR FOLLOWING COMPLETION OF MASTER'S DEGREE.

Please upload any study materials related to the procedure(s)

Study material FULLSURVEY_FRENCH_VERSION1_20230717.PDF
Study material FULLSURVEY_ENG_V2_20231005.PDF
Study material INTERVIEWGUIDE_V2_20231005.PDF

Does the study involve the administration or use of an approved drug or natural health product?

No

Will you be collecting any biological specimens?

No

Will you be creating or contributing to a bio-bank, bio-repository, registry, as part of the study?

No

Will you be doing any genetic testing or analysis?

No

Incidental and secondary findings

See [Guideline for reporting incidental and secondary findings to study participants](#)

Are any of the methods or procedures used likely (i.e., a real possibility and probability) to reveal an incidental finding (i.e., discoveries made in the course of research but that are outside the scope of the research and/or results that are outside the original purpose for which a test or procedure was conducted)?

No

Are any of the methods or procedures used likely to reveal a secondary finding (i.e., findings that are not the primary target of the test or procedure; rather, it is an additional result that is actively sought)?

No

Equipment use

Will there be any equipment used as part of this study?

No

Deception

Does the study involve deception or partial disclosure?

No

Risks and safeguards

Considering each method or procedure to be used in this study, indicate if participants might experience any of the following risks or harms

No known or anticipated risks

Outline the criteria for stopping the study early due to safety concerns/other issues.

None.

Privacy

Will demographic and/or background information be asked of participants? If so, ensure that the demographic questions have been uploaded in the methods section.

Yes

What demographic/background information will be collected?

Age

Gender

Ethnicity

Other

Describe what "other" demographic/background information will be collected.

Provincial/territorial residence location

Will demographic/background information be collected separately from names and other identifying information?

Yes

Participant identification - If applicable, include how participants will be referenced in study results.

The survey will be distributed using an anonymous link. The online interviews will be recorded and transcribed. Interviews will be numbered in sequential order of when they are conducted, and respondents will be referred to using this number (e.g., Respondent 1, Respondent 2, etc.)

If applicable how will the key/list that links participants' codes with their actual name and/or consent forms be stored and protected? Also, outline how long the key/list will be stored. The key that links participants' codes to their name and consent forms will be stored in a separate folder on a password protected computer for a minimum of one year following completion of the Master's study.

Are there any limitations to the promise of confidentiality?

No

Will any study data be leaving the University of Waterloo, the province, or country (e.g., member of research team is located in another institution, province, or country, etc.)?

No

Will any collected data or information be entered into a database for future use?

Yes

Where will the data or information be stored?

The data will be stored on password protected computers belonging to the Principle Investigator and the Student Investigator

Who will be the custodian of the data or information?

2024-04-10,

<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3e>

The Principle Investigator

Who will have access to the database?

Only the Principle and Student Investigators will have access to the data.

Indicate the measures in place to protect the confidentiality and security of the database.

Qualtrics will be used to distribute the survey and collect responses. All survey responses are encrypted. Additional information about Qualtrics privacy and security measures can be found here: <https://www.qualtrics.com/security-statement/> Survey information that is exported for review and analysis will be stored on password protected computers that only the Principal and Student Investigators can access. Interview audio recordings and transcripts will also be stored on password protected computers, with identifying information removed.

Are there other members of the research team who are not named on this application (e.g., co-op students, research assistants, or other temporary personnel) who may carry out specific tasks involved in your study?

No

Will individual participant identities be confidential in the publication or release of the study findings?

Yes

Data storage

What type(s) of data will be collected for this study?

Audio-recordings

Electronic files

For each type of information collected, identify where the data will be stored

Survey information collected by Qualtrics is stored at a Canadian data centre and backed up in Canada. Survey information downloaded by the Student Investigator will be stored on a personal password protected computer. The survey responses are anonymous and IP addresses and contact information will not be collected from respondents. OCT 9 - SURVEY INFORMATION WILL BE STORED ON A UWATERLOO SECURE ONEDRIVE Otter.ai will be used to record and transcribe interviews. Audio recordings will be downloaded in MP3 format and kept only until interview transcripts are verified. The audio will be transcribed in real time, and any personally identifying information will be removed from the transcript and coded immediately after the interview. Audio recordings and transcripts of interviews will be stored on a personal password protected computer until transcripts can be verified by interview participants. ADDED OCT 7: In summary: - two-factor authentication is required to create and access a user account - recordings and transcriptions must be started manually by clicking a button, rather than automatically - the user controls access to recordings and transcribed files, and these files are not used or accessed by Otter.ai unless explicit permission is sought and granted. This includes sharing of files (for instance, once an interview is completed, the student researcher can share the transcribed file with the specific interviewee right away for review) - uses Amazon Web Services (AWS) Simple Storage Solutions (S3) which is a secure, cloud-based storage system that blocks public access. All data is automatically encrypted when uploaded. - all files selected for deletion are permanently deleted within 30 days. Once audio recordings and transcriptions are completed, they will be downloaded onto a secure uWaterloo OneDrive folder and deleted from Otter.ai. Otter.ai privacy and security features can be found here: https://otter.ai/privacy-security?irclid=wnl3o53glxyPTHQR-3QSTT8eUkFWHk1NQwAtV00&irgwc=1&utm_content=Moonrover.pro&utm_term=1113693&utm_medium=tracking_link&utm_source=affiliate&utm_content=other

For each type of data collected, identify the minimum retention period

Survey and interview data will be kept for a minimum of one year following completion of the Master's degree.

Data Management

Are there plans to link the data collected with other data sets, databases, or registries?

No

The [Tri-Agency Open Access Policy on Publications](#) and some journals are requesting that research data be provided to an open access repository to promote the availability of findings, to enhance transparency and share with the widest possible audience.

Do researchers plan to make the data-set available in an online repository/archive?

No

Do you have a data management plan?

Yes

Consent and Withdrawal

What member(s) of the research team will be responsible for obtaining informed consent?

2024-04-10

<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce>

The Student Investigator.

Is there a relationship between the potential participant(s) and the person obtaining consent?

No

How will consent be obtained

Written signature on a consent form

Online consent (e.g., click one of two radio buttons)

Upload Information and Consent Materials - See [resources](#) and [samples](#) for creating information consent letters. Refer to the guide for creating an information consent letter on this [webpage](#).

Upload Information and Consent Materials

[SURVEYINFORMATIONLETTER_FRENCH_VERSION1_20230704.PDF](#)

Study group

Survey participants

Upload Information and Consent Materials

[SURVEYINFORMATIONLETTER_ENGLISH_V2_20231005.PDF](#)

Study group

Survey participants

Upload Information and Consent Materials

[SURVEYCONSENT_V2_20231005.PDF](#)

Study group

Survey participants

Upload Information and Consent Materials

[INTERVIEWINFOLETTER_V3_20231009.PDF](#)

Study group

Interview participants

Upload Information and Consent Materials

[INTERVIEWCONSENT_V3_20231009.PDF](#)

Study group

Interview participants

Do you anticipate that you will need to make special accommodations for your participant group?

No

Do you anticipate needing to put in place any special procedures when obtaining informed consent?

No

Will consent need to be re-documented throughout the life of this study?

No

Describe the participants rights and processes for withdrawing consent.

Informed consent begins during the recruitment process and participants can withdraw consent at any point given the type of participation. Participants are not waiving their legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities when they

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<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3e>

provide consent. Surveys - participants may decline to answer any question(s) by selecting "prefer not to answer", or by skipping to the next question. They may stop participating at any time by not submitting the survey responses and closing their web browser. The surveys are anonymous. Once the survey is submitted, it will not be possible to match individuals with their submitted response, so withdrawal will not be possible. Interviews - participants may withdraw consent at any time without penalty by advising the Student Researcher by November 30, 2023. Data cannot be withdrawn after results have been included in the Master's thesis for review by the graduate committee.

Outline what will be done with the participant's information (data, samples, etc.) if they withdraw from the study.

Survey - Participants have the option of skipping questions they don't wish to answer, or selecting "prefer not to answer". Answers with responses will be included in the results and analysis once the survey has been submitted. Interview - recordings and transcripts from interview participants who withdraw will be permanently deleted if withdrawal is confirmed before the Master's thesis is submitted to the graduate committee, or by November 30.

Will any individuals taking part in this study be unable to provide their own informed consent?

No

Remuneration

Will there be remuneration provided to show appreciation for a participant's time, effort, skills, etc. to take part in the study?

No

Will participants incur any expenses by participating in the study?

No

Feedback and Appreciation

How will you show appreciation to participants for taking part in the study?

Survey - written appreciation will appear once survey participants click the 'submit' button. Interview - verbal appreciation will be provided at the beginning and end of the interview. Written appreciation will be sent via email.

When will feedback/appreciation be provided to participants (e.g., immediately after the session, at the end of a survey, mail results at time X.)?

Survey - appreciation will be provided at the end of the survey. Interview - verbal appreciation will be provided immediately at the end of the interview. Written appreciation will be emailed within 24 hours of completing the interview.

Upload Feedback/Appreciation materials

Upload Feedback/Appreciation materials ENDSURVEY_V3_20231009.PDF Study group Survey participants
Upload Feedback/Appreciation materials INTERVIEWAPPRECIATIONLETTER_V2_20231009.PDF Study group Interview participants

How can participants learn about the study results/obtain a summary of the findings if interested?

Participants can contact the Student Investigator about results and findings. Survey results and general information about the study results will also be posted to the website www.targetingconservation.com

Other Details

Provide any other information relevant to this study you wish to explain to the Research Ethics Board reviewers or to the staff in the Office of Research Ethics.

I have confirmed that my Qualtrics account through UW does not have a limit on the number of survey responses, so survey volume is not expected to cause difficulty. The French version of the survey was translated by two French speakers: one person is a native English speaker fluent in French, and one person is Quebecois and therefore also has an understanding of cultural appropriateness. The survey is open to hunters as young as 13 years of age. All jurisdictions in Canada require completion of a hunter education course prior to acquiring a hunting license. The topic of conservation and hunting/environmental ethics is typically included in these courses. The subject matter of the survey should be familiar to youth by the time they become hunters. OCT 5: PLEASE SEE BELOW RESPONSES TO INITIAL FEEDBACK AND SUMMARY OF CHANGES. People: please find requested TCPS certificates uploaded Recruitment materials: - Website text added - Initial Recruitment for CWF organizations edited with track changes and replaced - Survey invitation email

2024-04-10, .

<https://uwaterloo.kuali.co/protocols/protocols/652554b0cbce3e>

edited and replaced – rearranged a lot of text so did not use track changes - Interview invitation email for CWF affiliate organizations to distribute added Methods and procedures: - Clarification added in ALL CAPS to Recruitment for Study (1b), Surveys (2b), Interviews (3h & i), and the last paragraph in this section that addresses data collection and sharing. - Survey time has been adjusted in recruitment materials to “approximately 15 minutes” and “less than 15 minutes” to complete. The actual survey time has been tested to be about 13 minutes. - The survey questions has been updated to reflect suggestions. A revised version is uploaded with changes made highlighted in yellow. - Interview Guide revised and uploaded as requested. Privacy: - Demographic information will be used primarily to describe the sample. In some instances, results of categories of demographic attributes (e.g., age) may be cross-tabulated with other responses (e.g. types of conservation activities in which respondents participate). The focus of the data analysis will be on conservation, not demographics. - Information will be stored on a secure uWaterloo OneDrive. Data storage: - Information will be stored on a secure uWaterloo OneDrive Consent and Withdrawal: - Only written consent will be obtained. - Survey Information Letter has been updated and uploaded as requested, with changes reflected using both ‘track changes’ and yellow highlights. Note that once the revised Information Letter is accepted by Ethics, I will ensure changes are translated, upload it to the survey, the survey website, and ensure all links have the updated letters. - Survey Consent revised and uploaded. - Interview Information Letter revised and uploaded. - Interview Consent revised & uploaded. Verbal consent will NOT be requested. Only written consent. The last item about seeking permission for future use was removed, since future use is adequately covered by a previous request “I agree to the use of anonymous quotations in any paper or publication that comes from this research.” I was thinking about ‘future publications from this research’. Feedback and Appreciation - End survey text revised and uploaded as requested. Once accepted by Ethics, I will update the survey with this text in both French and English. OCT 7: Funding - transcription from Otter.ai will be funded by supervisor Stephen D. Murphy.

Other Attachments

Upload any additional study documents

Attachments

Attestation

As the Principal Investigator/Faculty Supervisor/Local Investigator, I attest to the following:

- I will ensure all co-investigators, collaborators, and student investigators listed on this application have reviewed the application contents and will conduct the study according to the application/protocol.
- I am aware that any changes made to the research must be reviewed and provided clearance before the changes are implemented. Change requests (i.e., an amendment) are to be submitted through the system. I am also aware ethics clearance for this study is valid for only 12 months unless I renew the study prior to the ethics clearance expiry date. If an annual renewal report is NOT submitted through the system prior to the expiry date, the study will be suspended, all work on the study must stop, and Research Finance will be notified which will result in a hold being put on the funds associated with this study.
- I agree to comply with the [Tri-Council Policy Statement \(TCPS2\)](#) for conducting research with human participants and with University of Waterloo policies and guidelines when conducting this study (e.g., [statement on human participant research](#), [IST policies](#), etc.).
- I confirm I have read the [University of Waterloo Research Integrity guidelines](#) and I agree to comply with the policies and guidelines of my profession or discipline regarding the ethical conduct of research involving humans.

By submitting this application I agree to the above attestations and will ensure the research is conducted accordingly

Only the Principal Investigator/Faculty Supervisor can submit the application. This acts as a signature indicating approval of the application.

This is the end of the application form. Click submit in the right menu if you are ready to send it to the Research Ethics Office.