

A Human Dimensions Study of Newfoundland and Labrador's Murre Hunt

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ABSTRACT

The province of Newfoundland and Labrador (NL) presents a unique natural resource management situation in which the province's coastlines are recognized as preferential nesting grounds for migratory bird species, yet the province is the only place in North America where non-Indigenous hunters are legally permitted to hunt species of migratory seabirds. This study explores the murre hunt in NL in terms of cultural importance to hunters and attitudes regarding current and potential resource management strategies. This study investigates the social and cultural influence of the murre hunt in NL. Focusing on the social dimension of a Human Dimensions of Wildlife Resources framework, the hunt's history and observed hunter perspectives in survey responses will be discussed. Additionally, this study considers the legal dimension of murre hunting. It is focused on exploring how hunters perceive current hunting regulations under the Canadian Migratory Bird Act Regulations and how these regulations impact the hunt. The following manuscripts will explore the murre hunt in NL in terms of cultural importance to hunters and attitudes regarding current and potential resource management strategies. The findings presented in this thesis will be of interest to hunters, policymakers, and wildlife officials as this research could inform future amendments to hunting regulations.

Keywords: murre, wildlife management, hunting, human dimensions of wildlife resources, Newfoundland & Labrador

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GLOSSARY – ACRONYMS

Canadian Wildlife Services - CWS

Environment and Climate Change Canada - ECCC

Grenfell Campus Research Ethics Board - GC-REB

Hunter Opinion Survey - HOS

Harvest Questionnaire Survey - HQS

Highly Pathogenic Avian Influenza - HPAI

Human Dimensions of Wildlife Resources - HDWR

Local Ecological Knowledge – LEK

Marine Biogeographic Unit - MBU

Migratory Bird Convention Act - MBCA

Migratory Game Bird Hunting Permit - MGBHP

National Harvest Survey - NHS

Newfoundland & Labrador – NL

North American Bird Conservation Initiative - NABCI

Perceptions, Attitudes, and Values - PAV

Royal Canadian Mounted Police – RCMP

Species Composition Survey – SCS

Statistical Package for the Social Sciences - SPSS

Traditional Ecological Knowledge - TEK

CHAPTER 1: GENERAL INTRODUCTION

1.1 General Introduction

In 2022, Environment & Climate Change Canada (ECCC) pursued a proposal to amend the federal Migratory Bird Convention Act (MBCA) by revisiting and updating the hunting regulations for migratory birds in each province and territory for the 2022-2023 and 2023-2024 hunting seasons (Canadian Wildlife Service Waterfowl Committee, 2022). In the province of Newfoundland & Labrador (hereafter, NL), ECCC did not pursue any changes to hunting regulations. NL's coastal environments are home to an abundance of migratory seabird species (Allard et al., 2014); therefore, it is important to understand how existing regulations will affect how harvesters interact with the species as well as perceptions, attitudes, and values regarding possible regulation changes. The federal government's decision for NL's hunting regulations to remain the same comes at a time in which there is raised concern among various groups in the province regarding seabird mortality rates, specifically for Common Murre (*Uria aalge*) and Thick-billed murre species (*Uria lomvia*) (CBC, 2022a; CBC, 2022b). With enforcement officers and hunters both reporting high rates of illegal murre harvesting, the sustainability of the hunt is being threatened (Cox et al., 2024). Not only has NL been recognized as being an integral breeding ground for these species (Allard et al., 2014), scholars are beginning to recognize the plethora of threats that are increasingly being imposed on migratory birds including the impacts of the offshore oil and gas industry, plastic ingestion, hunting, and Highly Pathogenic Avian Flu (HPAI) (Fraser, 2016; Jardine et al., 2021; Caliendo et al., 2022). With the federal government deciding to keep existing hunting regulations in place, in combination with increased public concern over murre populations, there is a need to further understand the opinions and perspectives of murre hunters in NL.

1.2 Migratory Birds

What separates migratory seabirds from other avian species is that they can be found across the globe as they travel through an array of marine environments and are adapted for life on both land and sea. Biologists describe seabirds as being philopatric and colonial, meaning that they tend to return to a specific site where similar species of bird have clustered their nests (Greenwood & Harvey, 1982; Piatt et al., 2007). Seabirds are “marine top predators” (Lascelles et al., 2012, p. 5) meaning that they consume a variety of other marine species found at different levels of the food chain (Lascelles et al., 2021). Different species of seabirds will migrate varying distances across the globe for breeding and wintering. For example, the Sooty Shearwater breeds in the Falkland Islands and spends winter on Canada’s east coast (ECCC, 2019). Canadian Wildlife Service (CWS) and ECCC reported in 2019 that 95% of Canadian seabirds are a conservation concern and over 20 of the 58 species that spend part of their lives in the country are at risk of extinction (ECCC, 2019). While the status of seabirds acts as an environmental indicator on its own, these species can also grant further insight into the overall health of marine ecosystems as well as information on other species within the food web such as fish and crabs (Piatt et al., 2007; Parsons et al., 2008; Allard et al., 2014). In the 1980s, researchers had begun to use seabird populations as an indication of fish stocks. This work then expanded over the coming years as researchers increasingly began using seabirds as indicators of climate change (Piatt et al., 2007). Due to their ability to grant further information on their surrounding environment accompanied by an increasing risk of extinction, seabirds have become a focus for many wildlife conservation groups.

1.2.1 Migratory Seabirds: Threats & Conservation

Spending a portion of their lives on the coastline and the rest on the ocean means that seabirds are vulnerable to threats imposed in both environments. Lieske et al. (2020) assess the threats imposed on colonial-nesting seabirds in eastern Canada by dividing the various threats into categories including marine traffic, light pollution, ship-source oil pollution, and fisheries bycatch. Marine traffic has been shown to interrupt seabird feeding and breeding routes as well as cause injury or mortality due to vessel strikes. Light pollution is another source of interruption to flight patterns as the rays emitted from lights can disorient birds. Ship-source (and non-ship-source) oil pollution has the potential to threaten seabird species via the ingestion of harmful chemicals. Fisheries bycatch poses a risk to species while at sea as making contact with nets can result in injury or mortality. Also, of great concern to the morality of seabirds are hunting regulations and other recreational activities as well as diseases such as HPAI. Most of the threats imposed on seabirds are the result of human activity indicating that the endangerment of these species is a result of anthropogenic processes (Lieske et al., 2020).

With the potential of seabirds being used as environmental indicators being well established between the 1980s and early 2000s, conservation efforts for these species consequently began to increase, including amendments to the Migratory Birds Convention Act of 1917, which was updated in 1994 and again in 2005, and protected “all regularly-occurring seabirds in Canada” under the MBCA (ECCC, 2013). Since the amendment of the Act in 1994, the Canadian government further enacted the National Plan of Action for reducing the incidental catch of seabirds in longline fisheries in 2007 having recognized the threat that bycatch in longline fisheries imposed on seabirds. In 2022, ECCC amended the MBCA by revisiting and updating the hunting regulations for migratory birds in each province and territory for the 2022-

2023 and 2023-2024 hunting seasons (Canadian Wildlife Service Waterfowl Committee, 2022). Although the critical state of Canada's seabirds has been acknowledged, the hunting regulations in certain provinces, such as NL, still allow the seasonal hunting of certain migratory species, such as the murre. The regulatory changes observed in this amendment included revisiting the bag limits, season possession limits, and season lengths for Canada geese (*Branta canadensis*) and Cackling geese (*Branta hutchinsii*) in Nova Scotia, New Brunswick, Prince Edward Island, Quebec, Ontario and Manitoba, as well as the bag limit for White-fronted geese (*Anser albifrons*) in Alberta and Saskatchewan (Government of Canada, 2022). ECCC did not address any regulatory changes in British Columbia, Nunavut, Northwest Territories, Yukon Territory, and NL. In NL, individuals possessing a Migratory Game Bird Hunting Permit (MGBH) (or Youth Migratory Game Bird Hunting Permit) are permitted to hunt 20 murre a day (bag limit) and have a total of 40 murre in their possession (possession limit). The murre hunting season is open from September to March. A permit holder's hunting zone dictates the exact dates that they are allowed to hunt, for example, hunters in possession of permits for Murre Zone No. 1 are permitted to hunt in their zone from September 1st to December 16th (Government of Canada, 2024).

1.2.2 Migratory Seabirds & Newfoundland & Labrador

Canada's east coast has been identified by researchers as being a hot spot for seabird colonies (Nuttall Ornithological Club, 1987; Allard et al., 2014; Lieske et al., 2020). Migratory seabirds that can be found along the coastlines of NL include Gulls (*Laridae*), Northern Storm Petrels (*Hydrobates pelagicus*), Shearwaters (*Procellariidae*), Northern Gannets (*Morus bassanus*) as well as Puffins and Murres (*Alcidae*) (ECCC, 2017). Federally, the habitats of these species in NL are broken down into two regions: Marine Biogeographic Unit 10: Newfoundland

& Labrador Shelves (MBU 10), and Marine Biogeographic Unit 12: Gulf of St. Lawrence (MBU 12), which, when put together, comprise the entirety of NL’s coastline (see figures 1 and 2 below) (ECCC, 2013). Within MBU 10, on the province’s east coast is the Cape St. Mary’s Ecological Reserve, home to one of North America's largest seabird nesting sites (Newfoundland & Labrador, 2024a).

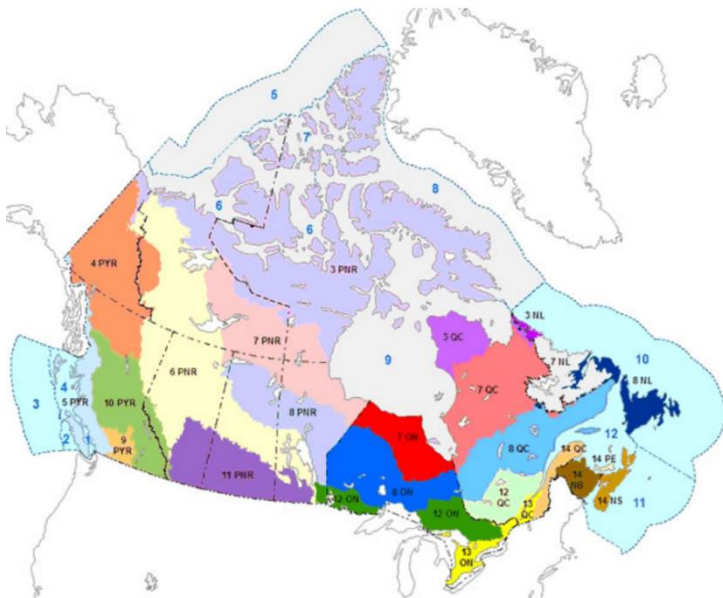


Figure 2: Map of Marine Biogeographic Units in Canada



Figure 1: Map of Murre Hunting Zones in Newfoundland & Labrador

Evidence of seabird hunting in NL can be traced back to the earliest known people to live in the province (Montevecchi et al., 2007). Archaeological research conducted in North America’s largest prehistoric cemetery on the province’s northern peninsula in Port aux Choix found beaks included in human burials indicating that seabird species were regarded with some importance by Maritime Archaic People (Montevecchi et al., 2007). The seabirds populating NL’s marine ecosystems also offered an opportunity to early European settlers with fishermen using seabird feeding areas as indicators of pooling fish as well as using seabirds as bait or seasonal subsistence for families (Nuttall Ornithological Club, 1987).

While seabirds hold biological importance throughout the globe, they also have great cultural significance in NL; for example, the Atlantic Puffin (*Fratercula arctica*) has been adopted as the provincial bird and hunting murre is a popular pastime and subsistence activity. The murre hunt has historical roots in NL with murre acting as an essential source of nutrients in place of fish during the winter months in coastal communities (Montevecchi et al., 2007; Turner, 2015; Intervale, 2022). Following NL's joining Canada in 1949, the murre hunt became illegal because of the MBCA but, after learning about the new illegal status of the hunt, residents and politicians in coastal areas of the province were swift to express their opposition to these post-confederation conditions (Turner, 2015; Humphries, 2022). With Canada's federal government accepting the importance that murre had to winter sustenance in NL's coastal communities, the murre hunt in NL was granted a "political accommodation" (Turner, 2022, p.7) from the MBCA in 1956, allowing residents of the province to hunt murre (Turner, 2015; Humphries, 2022). As described by Turner (2015), NL's murre hunt presented a unique situation in which the hunt was "being accommodated politically" (p.7) but did not have legislation for proper regulation. Although hunting murre was now legal, NL lacked the research and resources needed to properly implement regulations and enforcement for the hunt under the MBCA. The hunt continued in this mostly unregulated manner until the 1980s when advancements in technology increased hunting efficiency thus resulting in conservation concerns among wildlife officials (Turner, 2015; Humphries, 2022).

In the decades following confederation, NL experienced increased globalization and exposure to more advanced technologies (Montevecchi et al., 2007). Through increased access to food and food-preserving technologies, the necessity for murre hunting declined but the hunt continued, nonetheless. Having established such a significance throughout the province before

confederation, the hunting and consumption of murre continued as a heritage activity with murre continuing to be enjoined as a cultural dish, offering a fresh alternative to the frozen or processed foods that are commercially available (Montevecchi et al., 2007).

Although seabirds are of great importance to many residents of the province, federal conservation efforts to protect avian species have mainly been focused inland with little effort being made to protect coastlines and marine environments (Allard et al., 2014). Threats facing NL's migratory seabird population are diverse. NL is heavily engaged with the oil and gas industry, with MBU 10 having multiple offshore oil rigs currently in operation (ECCC, 2014) that threaten seabirds in the area. Furthermore, the fishing industry perpetuates further harm through bycatch and plastic ingestion (Regular et al., 2010; NABCI, 2019). In 2022, CWS reported on increased murre mortality in NL resulting from HPAI (Government of Newfoundland, 2024a). While the increased mortality raised concern amongst stakeholders, it was reported that HPAI was mostly infecting Common Murre breeding in NL waters, however, it is the Thick-billed Murre, which breeds in the Arctic, that makes up the majority of the province's harvest indicating that HPAI was not a threat to the province's murre hunt (Government of Newfoundland & Labrador, 2024a). Furthermore, mortality was often confined to specific geographic areas. For example, two thousand murre carcasses were tested for HPAI in the St. Lawrence River area. In 2023, no mortality related to HPAI was reported following CWS seabird colony surveillance indicating improved health of the species and providing reassurance to hunters (Government of Newfoundland & Labrador, 2024a). With NL's coastlines being recognized as such an integral nesting site for a variety of migratory seabird species, the province's coastlines, marine environments, and their species must have sustainable regulations that appropriately address the threats imposed on these often-threatened species.

1.3 Problem and Research Statement

The province of NL presents a unique natural resource management situation in which the province's coastlines are recognized as preferential nesting grounds for migratory bird species, yet the province is the only place in North America where non-Indigenous hunters are legally permitted to hunt species of migratory seabirds. An NL resident in possession of a Migratory Game Bird Hunting Permit (MGBHP) can hunt ducks (*Anatidae*), geese, snipe (*Gallinago gallinago*), and murre. Although hunters target an array of bird species, it is murre that has drawn the attention of the public and local news outlets in recent years regarding hunting regulations and human-wildlife conflict (CBC, 2022a; CBC, 2022b; Humphries, 2022; Cox et al., 2024). To address the conservation concerns of wildlife officials, concerned stakeholders, and murre hunters, that have arisen over the murre hunt in past years, this study has the intent of achieving the following objectives:

- 1) to establish an understanding of murre hunter perceptions, attitudes and values (PAV) regarding the cultural significance of hunting murre in NL and,
- 2) to establish a comprehensive understanding of murre hunter perceptions, attitudes and values (PAV) regarding hunting regulations in NL and provide recommendations for future amendments to the MBCA in NL based on hunter PAV.

1.4 General Methodology

1.4.1 Human Dimensions of Wildlife Resources (HDWR)

In the past, conservation research has been broadly approached through the natural sciences, however, since the 1980s the field of human dimensions of wildlife resources (HDWR) has been emerging as an approach to conservation concerns which aims to consider the interdisciplinary nature required to develop effective conservation initiatives (Sandlos et al, 2017). HDWR has

been recognized as a means of assessing human-wildlife and human-human conflicts within the field of resource management (Pimid et al., 2022; Serota et al., 2023). Bath (1998) asserts that “wildlife resource management, has two broad components: a human component and a biophysical component” (p. 350). In Bruce Mitchell’s *Models of Resource Management* (1989), these components are further broken into dimensions that can be observed both spatially and temporally, including economic, social, political, legal, institutional, and technological perspectives (see Figure 3 below). The methodological process of this paper is grounded within the field of HDWR, meaning that human participants (Murre hunters) will be used as a means of collecting data and developing approaches to manage natural resources (Murre) through engaging directly with stakeholders (Bath, 1998).

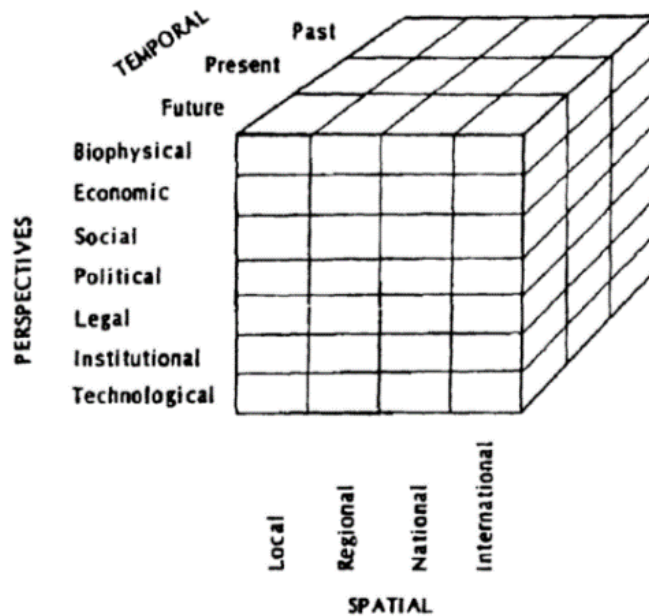


Figure 3: Dimensions of resource management (Mitchell 1989) taken from Bath 1998

By approaching natural resource management through human dimensions, one of the main obstacles that stand in the way of effective resource management (human interference) is taken into consideration and utilized as a method to address management concerns. In the case of NL’s

migratory seabird population, many of the threats are human-induced such as hunting and coastal habitat destruction. In addition to data gathered by wildlife officials, murre hunters are a group of individuals who interact directly with murre and murre habitats and can offer additional insight into the biological and environmental conditions that they observe when hunting. By better understanding how murre hunters view the hunt culturally as well as how they perceive the threats facing migratory seabirds and the regulations to protect them, current conditions can be better addressed. This research will address murre hunter concerns by narrowing in on two of the major human dimensions of the hunt, the social and legal perspectives, and how these perspectives developed over time in NL. Consideration will also be given to other dimensions as they pertain to and impact the social and legal perspectives of the hunt.

1.4.2 Survey Structure and Administration

Because human participants were engaged in this study, research ethics approval was obtained from the Grenfell Campus Research Ethics Board (GC-REB). Review by the GC-REB ensured that survey items were ethical while also ensuring the privacy and security of participants. As the intent of this project was to collect data on hunters' perceptions of regulations as well as the threats facing migratory bird species, the survey did not seek personal information, and was approved by the Grenfell Campus Research Ethics Board (GC-REB File #: 20240820). To collect PAV data from murre hunters, a survey was created and distributed (see Appendix A). Survey questions were designed to explore different human dimensions of the murre hunt. Close-ended questions were used to gauge the extent to which participants agreed with statements such as "Hunting murre is important to my culture" as well as provide feedback on hunting conditions through prompts like, "How do you feel about the amount of migratory bird enforcement of all types (bag checks, boat checks, selling charges, etc.) in your area?".

To ensure that the data collected was accurate and exhaustive, this project used a large-N subsample (1800 surveys) to make inferences about the province's larger population of approximately 7200 murre hunters. A random distribution, proportional to the number of permit holders in each postal area code, was used to allow for geographical comparisons. Surveys were distributed both online and through the mail to individuals contained within the federal murre hunter database. Nine hundred surveys were sent to email addresses attached to hunter data in addition to nine hundred surveys that were sent through the mail. The online survey was designed and distributed using Google Forms. The use of Google Forms helped prevent duplicate survey responses as participants were required to provide an email address to complete the survey. Addresses were kept anonymous and not used for data analysis. Physical copies of surveys sent to hunters in the mail also included a QR code so that participants could complete their survey online if that was their preferred means of communication. Furthermore, surveys that were sent in the mail were enclosed with a stamped (postage-paid) envelope and the address to the ECCC Mount Pearl office. These measures were taken to help increase response rates and remove any obstacles regarding mailing costs for participants. Surveys were distributed and collected between May and August 2024.

1.5 Data Analysis

The murre hunter survey was composed of close-ended questions asking participants to rank their agreement with specific statements on a scale ranging from strongly disagree to strongly agree as well as some open-ended questions inquiring about hunter experiences and background. Survey responses were grouped and analyzed following the research objectives of the study. This study was conducted through an inductive approach; therefore, no initial hypotheses were formulated regarding the expected findings of the research objectives. The

analysis included observing patterns found within survey responses and reporting on the major themes revealed through these patterns.

Survey data was entered into the data processing programs Microsoft Excel and Statistical Package for the Social Sciences (SPSS). Data was analyzed using descriptive and inferential statistics. Descriptive statistics were used to analyze responses to survey questions providing frequencies, means and ranges. Using descriptive statistics, trends in the data were explored, allowing for survey data to be summarized. Inferential statistics were used to make inferences about NL's murre hunting population using the sample of murre hunters who participated in the survey. Understanding hunters' perceptions regarding seabird populations will ultimately provide a foundation by which new regulations can begin to be explored.

Not all surveys were able to be delivered to survey participants as the information available for them within the murre hunter database was outdated or incorrect. These delivery errors resulted in approximately 1740 of 1800 surveys being delivered to potential participants. Of the 1740 surveys that were delivered, 155 surveys were returned, resulting in an overall response rate of approximately nine percent. Additionally, some surveys were returned partially completed resulting in the collection of more data for certain survey questions while slightly less for others.

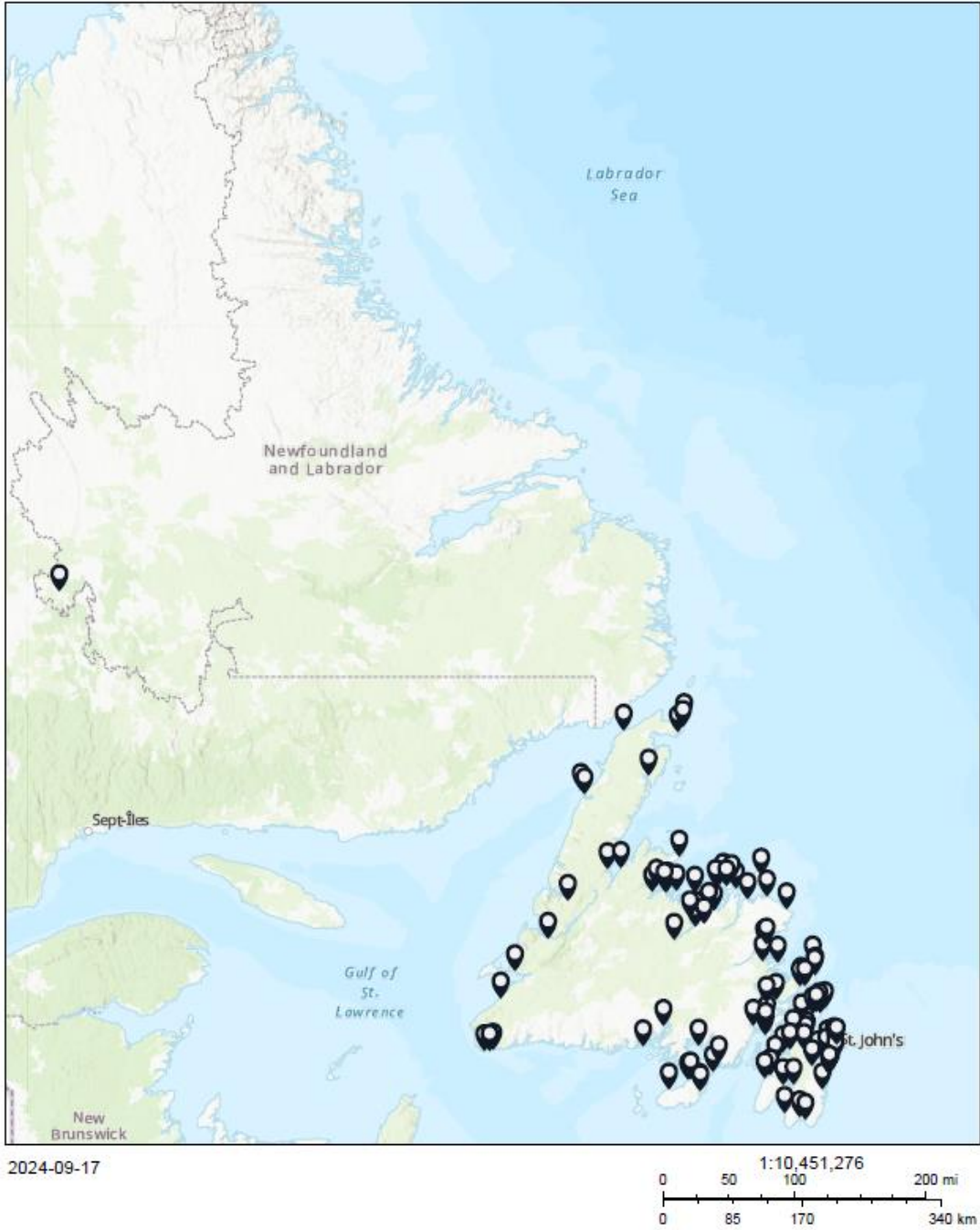
1.5.1 Demographics of Survey Respondents

This survey was designed to be inclusive and present a representative sample of the entire demographic of murre hunters in NL including age, sex and location. Survey responses were far greater for males than females. From a total of 153 respondents, 148 identified as male, four as female, and one as 'other'. In terms of the geographic distribution of responses, 146 survey respondents live in communities located in insular Newfoundland (the island) while only one

survey respondent lived in Labrador (see Figure 4 below). In terms of age, there were far greater mature and senior survey respondents. Survey respondents were between the ages of 18 and 65 plus, with 107 respondents identifying as being 55 to over 65 years old.

To gain an understanding of the experience level of survey respondents, questions were asked regarding the total amount of years hunting murre as well as experience hunting other species. Most respondents could be considered seasoned hunters as 146 survey respondents answered the question “How many years have you been hunting murre?” with approximately 30 years. Survey responses were far greater for experienced hunters (hunting multiple species of wildlife in NL) than for those respondents who strictly hunt murre. When asked about hunting species besides murre, 147 survey respondents indicated that they hunt other species such as moose (*Alces alces*) or hare (*Lepus arcticus*) while six respondents reported that they only hunt murre. Hunters were asked if they would hunt sea ducks (*Somateria mollissima*) in addition to murre during their hunting trips, however, over half of respondents reported that they solely hunt murre. Additionally, survey responses were divided between 83 hunters who participate in the hunt every season, and 70 respondents who do not.

2024 Murre Hunter Survey Respondent Communities



Esri, TomTom, Garmin, FAO, NOAA, USGS, NRCan, Parks Canada, Esri, USGS

Figure 4: Distribution of Murre Hunter Survey Participant Residence

1.6 Manuscript Overview

The two manuscripts presented in this thesis are based on a quantitative approach to data collection. This research was approved by the Grenfell Campus Research Ethics Board (GC-REB File #: 20240820). The manuscripts presented in this study are intended to be complementary to fellow researcher, Claire Breton's, qualitative study, *Human Dimensions of Newfoundland and Labrador's Murre Harvest (Interview Portion)* (Breton, 2024). Source documents, such as newspapers, government documents and scientific papers were used to provide a background of the NL murre hunt and provide context for hunter survey responses. The following manuscripts will explore the murre hunt in NL in terms of cultural importance to hunters and attitudes regarding current and potential resource management strategies. Chapter 2 investigates the social and cultural influence of the murre hunt in NL. Focusing on the social dimension of the HDWR framework, the history of the hunt as well as hunter perspectives regarding heritage and tradition will be discussed. Chapter 3 considers the legal dimension of murre hunting and is focused on exploring how hunters perceive current hunting regulations under the MBCA and how these regulations impact the hunt. The findings presented in these manuscripts will be of interest to hunters, policymakers, and wildlife officials as this research could inform future amendments to hunting regulations. The author of this thesis designed and distributed all surveys, performed all the data analysis, and prepared the manuscripts contained within.

2.0 CHAPTER 2: The Cultural Importance of Newfoundland and Labrador's Murre Hunt

2.1 Introduction

Common murre and thick-billed murre, both colloquially known in NL as turr, are the target of NL's long-running murre hunt. One of the major dimensions that impact the murre hunt and its regulation in NL is the cultural significance surrounding the hunt (Humphries, 2022).

There are a variety of motives that encourage people to hunt different species including economic and environmental benefits. Legally, the selling of murre goes against the regulations outlined within the MBCA. Hunting murre can also be costly. Humphries (2022), estimated that, excluding the cost of a boat, the cost of fuel, food, and shotgun shells, "ranged between \$100 to \$150" (p.23) per trip. Therefore, there is no evidence of economic gain for murre hunters other than providing protein for their families, thereby reducing commercial meat purchases.

Furthermore, unlike other commonly hunted species in the province, like moose, there is no evidence to suggest that there is an overabundant murre population impacting the environment (Newfoundland & Labrador, 2024b), which further suggests that the murre hunt is mainly rationalized by hunters through societal and cultural factors.

Rouhi (2017) explores the concept of cultural heritage, describing culture as "social organization, custom and tradition, religion, language, art and literature, form of government, [or] economic system" (p.7110) and describing heritage as "a property, something that is inherited from past, and transferred from previous generations" (p.7110). Cultural heritage can therefore be understood as an array of activities, organizations and objects that have been inherited from the past from previous generations. The tradition of hunting murre during the winter months in NL is an activity that was passed through generations and has been inherited by today's hunters.

2.1.1 Existing Literature on Murre Hunting Culture in NL

Research focusing on the social and cultural importance of hunting murre in NL is limited. However, retired Canadian Wildlife Service manager, Bruce Turner, explored the social significance of the murre hunt in the province in his *History of the Newfoundland Murre Hunt* (2015). Turner explains that the hunt has such a historical significance in the province that it is the only place in North America where non-Indigenous residents are currently permitted to hunt a species of migratory seabird. Given the province's location on the edge of the Atlantic Ocean, early European settlers of the island leveraged any resources that the local waters had to offer including seabirds, like the coastal murre colonies (Nuttall Ornithological Club, 1987; Montevecchi et al., 2007). Murre became a staple source of meat during the winter months for early settlers as it was difficult to fish during this time of the year due to the presence of sea ice (Turner, 2015; Montevecchi et al., 2007). Following NL's entry into Confederation with Canada in 1949, the province's murre hunt became threatened by the Migratory Bird Convention Act of 1916, an agreement between Canada and the United States that made the hunting or harvesting of seabirds and their eggs illegal – although this was never brought to the attention of the public (Newfoundland & Labrador, 2011; Turner, 2015). Five months after NL had officially become Canada's tenth province, The Twillingate Sun was the first public source to acknowledge the overhaul of the hunt with its October 1st article, "TURRible Law Applies", in which readers were advised that "For the first time in the history of this ancient settlement, the old warning to the children, "look but don't touch" (p.4) will apply to grown men who cast a longing eye on migratory non game birds" (The Twillingate Sun, 1949, p.4; Turner, 2015).

Existing literature on NL’s murre hunt suggests that the hunt continues today as hunters perceive it as a “historic right” (p.18) for residents of the province (Humphries, 2022). As pictured in Labrador illustrator, Cindy Colosimo’s *Turr Hunting: A Newfoundland and Labrador Heritage* (see Figure 5 below), hunting murre is not only perceived as a means of obtaining an alternative meat but also as a heritage activity that sees people coming together. Also noted in the infographic is that “For hundreds of years, turrs provided essential winter food for people living in outports. Today, preparing a meal of turrs is celebrated as a family tradition” (Intervale, 2022, para.1). This is an important distinction to make as it recognizes that hunters’ relationship with murre has changed over time, and further, that there has been a cultural shift in murre being



Figure 5: Turr Heritage Placemat (Intervale, 2022)

historically perceived as a fundamental source of meat for communities in the winter versus current attitudes which perceive hunting murre as a recreational or heritage activity and consuming murre to be something done out of tradition or personal enjoyment rather than necessity (Montevecchi et al., 2007; Humphries, 2022).

The history of hunter's changing relationship with murre is the focus of Montevecchi et al.'s 2007 article, *Hunting for Security: Changes in The Exploitation of Marine Birds in Newfoundland and Labrador*. As the globalization of food and advancement in food preservation technologies increased in NL post-confederation, the murre hunt experienced a transition in which it went from being a practice of subsistence to one of recreation and sport (Lund, 1980; Montevecchi et al., 2007). Consuming murre is considered a “refreshing alternative to [the] processed and frozen foods that dominate most North American diets” (Montevecchi et al., 2007, p.107). As murre is no longer an object of subsistence hunting, it is now a “cultural keystone species” (Garibaldi & Turner, 2004, p.1) or “cultural comfort food” (Montevecchi et al., 2007, p.107) as “many coastal residents still supplement their diets with marine birds because they enjoy them and because they are traditional meals” (Montevecchi et al., 2007, p.107). A recipe for baked murre can be found in Sally West's 1958 *The Treasury of Newfoundland Dishes* (see Figure 6 below), where she states that “Turrs are native to Newfoundland, and especially in the old day were eaten as a change from fish” (West, 1958, p.85):

<p>Baked Turr (Sea Bird) Clean the birds, and drain well, then dress. Following in dressing enough for one turr: 2 cups breadcrumbs 1 small onion (chopped) ½ teaspoon savory ½ teaspoon salt ¼ teaspoon pepper 1 tablespoon shortening</p>	<p>Put dressed bird in roaster. Sprinkle lightly with salt. Bake for about one hour. Prick skin of bird with fork, to drain off fat. Remove bird and throw away all fat from roaster. Return bird to oven placing ¼ pound of salt pork around and over bird, and bake until pork is brown. Add four or five cups of hot water, one large onion and one teaspoon salt. Bake until brown and tender. Baste or turn occasionally.</p>
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Figure 6: Baked Turr Recipe

West’s recipe book not only includes baked seabird as a traditional NL dish, proving its cultural importance but also acts as a source further indicating the changing relationships between hunters and murre. West’s suggested 1950s preparation of murre indicates readily available access to spices and seasonings as well as salt pork.

2.1.2 Early Murre Hunt Management in NL

From 1949 to 1955 hunting murre in NL was technically illegal as it went against the terms of the international MBCA. That was until 1956 when an amendment was made to the conditions of confederation which legalized hunting migratory seabirds for the residents of NL to hunt murre. Serious pushback from coastal communities in the province propelled the federal government to give the murre hunt in NL a “political accommodation” (Turner, 2015, p.7) which ultimately resulted in a murre hunt that was open to residents but unregulated in terms of daily harvest limits and season lengths (Turner, 2015). The mostly unregulated hunting of murre went on for about three decades from 1950 to the 1980s before technological advancements increased the efficiency of hunting equipment, ultimately leading to new sustainability concerns. With sustainability becoming an increasing concern, the federal government revisited the terms of the Migratory Bird Treaty in the 1990s to address the legality of the hunt in NL as well as to outline regulations for the hunt. In 1993, the Canadian Government established the first set of hunting regulations which included daily bag limits that were set at 20 birds per hunter, possession limits

that were set at 40 birds per hunter, and outlined the season for various hunting zones (Montevecchi et al., 2007). By the year 1999, the murre hunt in NL was recognized both federally and internationally in the *Protocol Between the Government of Canada and the Government of the United States of America Amending the 1916 Convention Between the United Kingdom and the United States of America for the Protection of Migratory Birds in Canada and the United States* (Government of Canada, 1999). It has been centuries since non-Indigenous residents of NL started hunting murre, in the years since, there have been major developments in terms of technology as well as increased access to reliable food sources through supermarkets (Montevecchi et al., 2007). As the initial argument to continue the hunt post-confederation was to ensure coastal communities with year-round access to meat, the motivation to continue hunting murre in the present day is founded on historical and cultural justifications.

2.1.3 Problem Statement

Conservation concerns are rising as migratory seabird species are facing increasing environmental and anthropogenic pressures (Regular et al., 2010; NABCI, 2019; Lieske et al., 2020; Humphries, 2022). In 2019, the North American Bird Conservation Initiative (NABCI) in partnership with ECCC published a report titled *The State of Canada's Birds* in which seabirds were deemed to be in “a global conservation crisis” (NABCI, 2019, p.7). Furthermore, the Murre hunt gained the public’s attention around 2016 when headlines from local news sources started to emerge reporting findings such as *Shot seabirds tossed like trash: ‘They shouldn’t be dead on a beach’* (Bailey, 2016) and *About 100 dead turrs, with breasts ripped out, thrown into ocean near Flatrock* (CBC, 2021). Given these recent and still-emerging threats to murre conservation and management, there is a need to better understand the primary motivations for the NL murre hunt

and provide a contemporary examination of hunter perspectives, attitudes and values (PAV) regarding murre harvest and conservation efforts.

2.1.4 Purpose Statement

Rouhi (2017) states that “our perceptions of the past determine the direction of our cultural heritage activities” (p.7110). Understanding murre hunter perceptions of the hunt and its connection to NL heritage can provide insight as to how the hunt came to have its current importance as well as the future direction of the hunt. The objective of this chapter is to examine the cultural significance of NL’s murre hunt and explore hunter motivations. It is already understood that the hunt is culturally important, however, the documented evidence for why it is important is limited and often dated and there are few if any, systematic studies that target the knowledge and perception of murre hunters. This study will address this gap by providing evidence of the murre hunt’s importance through an analysis of murre hunter perspectives. Through approaching this study with an HDWR framework, the social and cultural aspects of the hunt will be explored. The results of this study will act as a resource for future researchers and policymakers wishing to understand the social dimension of NL’s murre hunt.

2.2 Methods

2.2.1 HDWR: Social Dimension

Developing questions to fit the temporal scales included within the HDWR framework meant that survey participants were not only asked about the current cultural importance of the murre hunt but also how they perceived the importance of the hunt in the past as well as if they value the hunt as something that will be important to continue for future generations.

2.2.2 Survey Design and Administration

Data were collected through the distribution of anonymous online and mailed surveys that included close-ended questions that addressed various social dimensions of the murre hunt. This section will focus on those survey items focused on the cultural and traditional dimensions of the murre hunt. Furthermore, as the survey design allowed for respondents to remain anonymous, participants were given the opportunity to honestly and individually think through answers about their own hunting experiences when completing the survey. Nine questions were designed to gauge the cultural and social significance of the murre hunt to hunters in NL. Participants were asked about levels of agreement or disagreement with the following statements:

1. Hunting murre is important to my culture.
2. Hunting murre is an important source of income.
3. The murre hunt is important to the province of Newfoundland and Labrador.
4. Murre is a part of a traditional Newfoundland and Labrador diet.
5. Murre is an important food source for my family.
6. Hunting murre has been a tradition in my family for generations.
7. Hunting murre makes me feel connected to nature.
8. The murre hunt is a controversial topic in Newfoundland & Labrador.
9. It is important to me that future generations hunt murre.

In addition to these cultural questions, survey participants were also asked some simple details about their hunting excursions including if they hunted with family or friends and how many people their hunting parties consisted of. Through analyzing hunter responses to these questions, it can be established why the murre hunt has such cultural importance in NL.

2.2.3 Data Analysis

Survey responses were input into an Excel spreadsheet for analysis. Survey data were then analyzed using descriptive statistics. To identify the attitudes of murre hunters in response to hunting murre and its cultural significance, participants' levels of agreement or disagreement with statements about the social dimensions of the murre hunt were analyzed.

2.3 Results

This section of the chapter will present the results of the close-ended cultural questions answered by survey participants and will summarize the themes in participant responses. The goal of this research was to explore murre hunter PAV towards the cultural significance of hunting murre. For example, if the majority of respondents perceive the murre hunt as being important to NL's culture, and strongly agree with the statement, while fewer hunters perceive the hunt as not being important to the province's culture, and strongly disagree with the statement, then it can then be concluded that out of the hunters that responded to the survey, the majority agree that the murre hunt is important to NL culture. To gain an understanding of these perspectives and attitudes, nine statements were included in Section A: Cultural Responses. The results of these nine statements are presented below:

Table 1
Survey Responses to Cultural Questions

	Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Hunting murre is important to my culture.	Frequency: 5 3.2%	Frequency: 10 6.5%	Frequency: 16 10.1%	Frequency: 52 33.8%	Frequency: 71 46.1%
2.	Hunting murre is an important source of income.	Frequency: 97 62.9%	Frequency: 30 19.5%	Frequency: 18 11.7%	Frequency: 4 2.6%	Frequency: 5 3.2%
3.	The murre hunt is important to the province of Newfoundland and Labrador.	Frequency: 6 3.9%	Frequency: 2 1.3%	Frequency: 10 6.5%	Frequency: 56 36.4%	Frequency: 80 51.9%
4.	Murre is a part of a traditional Newfoundland and Labrador diet.	Frequency: 4 2.6%	Frequency: 2 1.2%	Frequency: 4 2.6%	Frequency: 68 44.2%	Frequency: 76 49.3%
5.	Murre is an important food source for my family.	Frequency: 9 5.8%	Frequency: 22 14.3%	Frequency: 25 16.2%	Frequency: 51 33.1%	Frequency: 47 30.5%
6.	Hunting murre has been a tradition in my family for generations.	Frequency: 7 4.5%	Frequency: 14 9.1%	Frequency: 10 6.5%	Frequency: 39 25.3%	Frequency: 84 54.5%
7.	Hunting murre makes me feel connected to nature.	Frequency: 3 1.9%	Frequency: 8 5.2%	Frequency: 20 13.0%	Frequency: 59 38.3%	Frequency: 64 41.6%
8.	The murre hunt is a controversial topic in Newfoundland & Labrador.	Frequency: 17.0 11.0%	Frequency: 49 31.8%	Frequency: 33 21.4%	Frequency: 44 28.6%	Frequency: 11 7.1%
9.	It is important to me that future generations hunt murre.	Frequency: 2 1.3%	Frequency: 4 2.6%	Frequency: 18 11.7%	Frequency: 56 36.4%	Frequency: 74 48.1%

2.3.1 Hunter Perspectives and Attitudes Towards Murre Hunting and Culture

When murre hunters were asked about their agreement to the statement, “Hunting murre is important to my culture”, it was found that respondents had a positive perspective, with over half of the survey respondents reporting that they agreed. Similarly, when murre hunters were asked about their agreement with the statement, “The murre hunt is important to the province of

Newfoundland and Labrador,” over half of the survey respondents strongly agreed with the statement. When exploring other cultural aspects, such as the importance of murre to a traditional NL diet, it was found that respondents also presented positive attitudes. Hunters also agreed that murre is an important food source for their families. Likewise, hunters also strongly agreed that the practice of hunting murre had been in their family for generations and that it is important for future generations to also have the opportunity to hunt murre. Additionally, survey respondents also presented a positive attitude when asked about murre hunting and feeling connected to nature. These findings suggest that the murre hunt is highly valued as a part of NL culture amongst murre hunters.

Survey respondents were also asked about the possible economic benefits of hunting murre to discover if there were motivations for hunting outside of cultural reasons. When asked if hunting murre was an important source of income over half of survey respondents reported that they strongly disagreed with this statement. These findings further suggest that the motivation to hunt murre in NL is strongly cultural and has little to do with economic gain. Finally, with the murre hunt’s unique regulation history, as well as ongoing conservation concerns for migratory seabirds, murre hunters were asked if they perceived the hunt to be a controversial topic in NL. Responses to this statement were divided with about 31 percent of respondents disagreeing, 28 percent of respondents agreeing, and another 21 percent feeling unsure or neutral.

2.3.2 Murre Hunting Parties

When analyzing survey respondents' responses to questions about their murre hunting party, it could be observed that hunting is a social activity that usually involves groups composed of friends and family members, typically occurring in groups of two or three. As shown in the pie chart below (see Figure 7 below), it can be observed that hunters lean towards hunting murre with friends as opposed to hunting with family or alone.

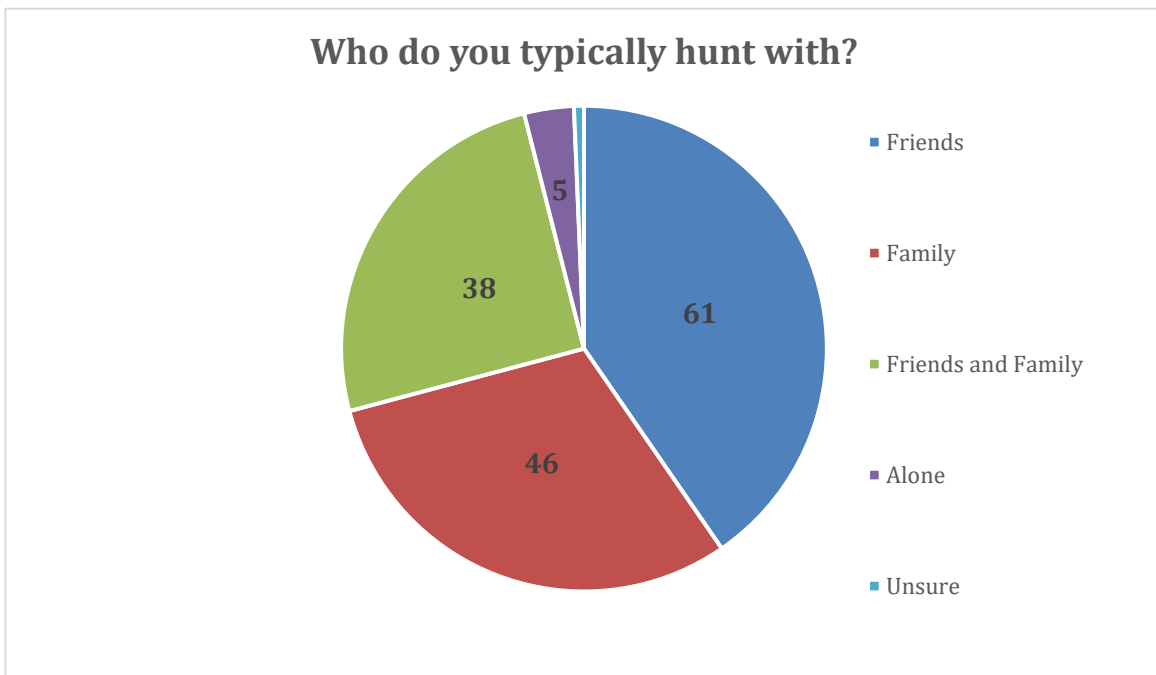


Figure 7: Pie Chart Displaying Survey Responses to 'Who do you typically hunt with?'

Regarding the size of hunting parties, most survey respondents reported that it is common to hunt in groups of two or three, and less common to see a hunting party of one or a larger hunting party of four (see Figure 8 below). Organized in small groups of two or three, hunting appears to present an opportunity for bonding between party members given the teamwork and cooperation necessary to hunt together. The makeup of murre hunting parties indicates that hunting murre is a team activity that brings people together to participate in a heritage activity.

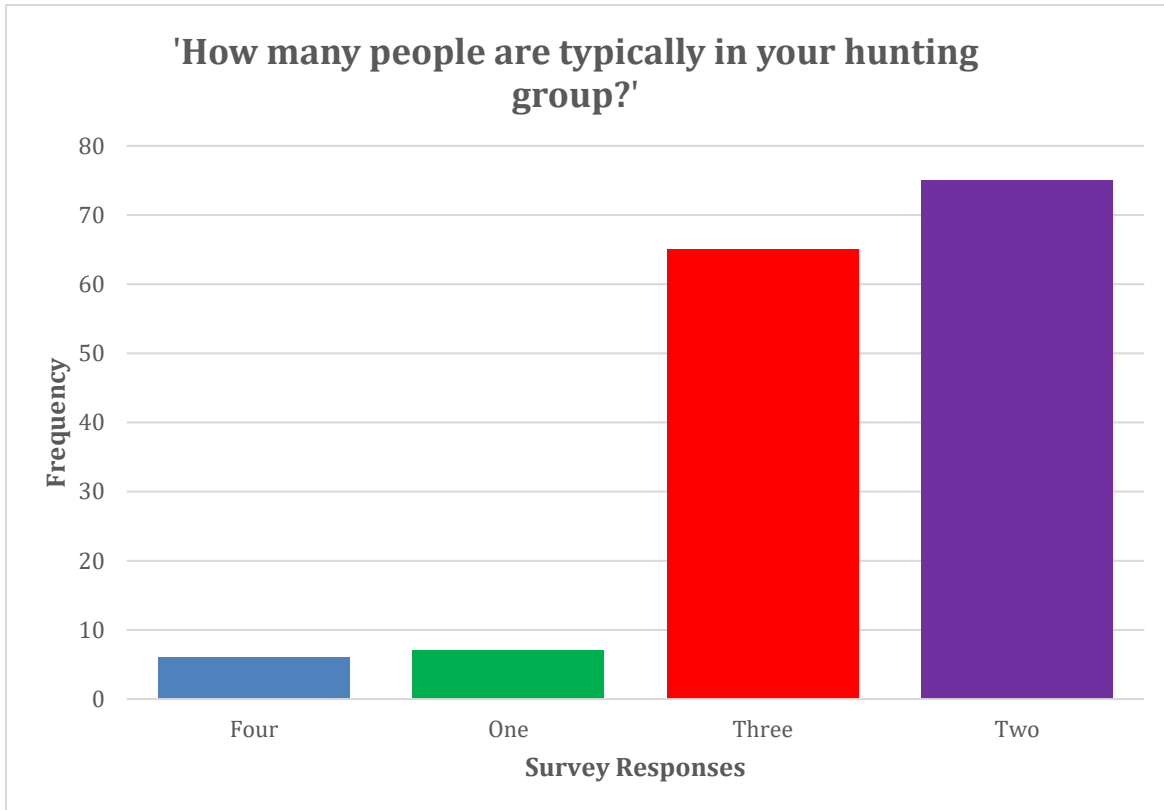


Figure 8: Bar Graph Displaying Survey Responses To 'How many people are typically in your hunting group?'

2.4 Discussion

This aspect of the study was designed to establish an understanding of murre hunter perceptions, attitudes and values (PAV) regarding the cultural significance of hunting murre in NL. To realize this objective, surveys including questions that explored the cultural dimension of the hunt were distributed throughout communities in NL to residents in possession of a MGBHP. The resulting information gathered from this study will benefit future researchers and policymakers in NL to ensure that any amendments to hunting regulations and enforcement are effective, informed, and reflect the PAV of murre hunters.

2.4.1 Hunting Murre in NL: Tradition, Heritage and Culture

Existing literature emphasizes the importance of the murre hunt as a part of NL tradition and heritage (Montevecchi et al., 2007; Turner, 2015; Intervale, 2022). When asking murre hunters in NL about the cultural significance of the hunt, hunters displayed a positive attitude

towards varying social aspects of the murre hunt. Respondents strongly agreed that hunting is important to their culture, traditional diet, and important to the province of NL overall. As suggested by Montevecchi et al. (2007), Intervale (2022), and Humphries (2022) murre meat is considered a part of a traditional NL diet because of the reliance that coastal communities have had on marine resources (Montevecchi et al., 2007; Humphries, 2022). Although rural residents no longer have to rely on hunting murre to sustain their families throughout the winter, the tradition of having a meal of murre is still strong amongst many residents of NL, and recipes for preparing murre can be found in traditional NL cookbooks (West, 1958; Montevecchi et al., 2007).

Furthermore, most respondents strongly agreed that hunting murre had been in their family for generations and that it was important for future generations to also have the ability to hunt murre. In addition to this, there was a trend amongst survey participants to perceive murre hunting as a means of connecting with nature. These findings are significant to the future of wildlife management in the province as the strong personal connections that hunters display indicate that the hunt will continue to be a topic of great importance to NL wildlife management and migratory seabird conservation.

In comparison, when asked about perspectives on socioeconomic aspects of the murre hunt, survey respondents displayed a neutral or negative attitude. For example, approximately 63 percent of survey respondents strongly disagreed that the murre hunt is an important source of income. Additionally, when it came to hunter attitudes regarding the perception of murre as an important food source, responses were not as strong when compared to hunter's attitudes toward hunting murre as tradition. Understanding how hunters perceive socioeconomic aspects of the hunt is fundamental in establishing an understanding of hunter motivations.

Turner (2015) discusses how the hunt “had developed to the point of being a cultural imperative, and a rite of passage for many boys growing up in rural Newfoundland and Labrador” (p.5). Hunting murre historically acting as a rite of passage for young men in rural NL not only indicates the cultural significance of the hunt but also the social significance of the hunt as participation was expected of young men, and perhaps a requirement to establish respect amongst other men in the community. Having asked hunters about the makeup of their typical hunting party, it can be observed that hunting murre is still a social activity. It was most common for respondents to report that they hunt in parties of two or three and usually with the company of family, friends or both. While it can be argued that this is simply the manner required to safely operate the boat and hunt murre, it also needs to be considered that hunting murre can be very dangerous, requiring trust amongst party members to hunt safely. Additionally, hunting murre presents opportunities to socialize through sharing a meal of murre as well as bonding over hunting experiences with fellow hunters. Results show that, although heavily unadvised for safety reasons, five survey participants reported that they hunt alone which further indicates that hunting murre is a social activity. Understanding the social dynamic of murre hunting parties is beneficial to wildlife management as officials can adapt enforcement and research strategies that target groups of hunters in addition to communicating with individual hunters.

2.4.2 Keeping the Tradition Alive

As suggested in existing literature, murre hunters displayed a strong historical connection to the hunt (Montevecchi et al., 2007; Turner, 2012). Hunting murre brings together family and friends through participation in historical activities (Intervale, 2022). Motivations for hunting murre include partaking in culturally significant activities with family and friends as well as valuing the hunt as a means of connecting with NL heritage (Intervale, 2022). These motivations

are further emphasized by the fact that the vast majority of hunters do not pursue hunting murre for purely economic gains. The NL murre hunt provides a way for residents to engage with the landscape in a way that was crucial to their European ancestors. Since murre is no longer a crucial part of the winter diet for residents in rural NL, it can be observed that harvesting murre and preparing a meal with murre meat is a practice of tradition and recreation (Montevecchi et al., 2007; Intervale, 2022).

2.4.3 Research Significance and Future Directions

This study builds on existing research which explores the historical significance of hunting murre as a heritage activity in NL (Montevecchi et al., 2007; Humphries, 2022). With the cultural significance of murre in NL having been established through its historical roots to early European settlers, future research can aim to identify and analyze the importance of other seabird species that are local to the province.

2.4.4 Recommendations

Murre hunting in NL has been recognized as a heritage activity by both researchers and hunters alike. Hunting murre is a way of standing in solidarity with those individuals who fought for NL residents to have a murre hunt after confederation (Turner, 2015; Humphries, 2022). Some senior residents who hunt murre remember the trials and tribulations that came with NL joining Canada and therefore perceive the hunt as a threatened part of NL heritage. The murre hunt is under pressure, with both changing environmental conditions and global conventions on the protection of migratory birds resulting in uncertainty for the future of the hunt (Cox et al., 2024). Murre hunters displayed a strong cultural connection to the hunt and the role it plays in NL heritage. To recognize the importance that the murre hunt had for early European settlers, it

is suggested that action is taken by the NL government to spread awareness about the murre hunt through public programs such as Heritage NL.

It was also observed that murre hunting had been shared in families through generations. Hunters value the preservation of the murre hunt and believe that it is important for future generations to have the opportunity to hunt murre. To ensure that future generations can participate in the murre hunt, it is of utmost importance that wildlife officials continue to monitor murre populations along the province's coast and adjust hunting quotas accordingly to support population sustainability. Currently, there are initiatives, such as the Newfoundland and Labrador Murre Conservation Fund, which generates "revenue from the sale of the Canadian Wildlife Habitat Conservation Stamps in Newfoundland and Labrador" (Government of Newfoundland & Labrador, 2024a, para.1) and puts it toward murre conservation and management. As a means of properly acknowledging the importance of murre to NL heritage, it is suggested that funding from these conservation initiatives also go towards highlighting the cultural importance of murre as well as the environmental.

3.0 CHAPTER 3: Policy Recommendations for Newfoundland and Labrador's Murre Hunt

3.1 Introduction

The murre hunt can be seen as a distinctive activity that sets the province of NL apart from the rest of Canada. Following NL's entry into Confederation with Canada in 1949, the province's murre hunt became illegal by the Migratory Bird Convention Act of 1916, an agreement between Canada and the United States that made the hunting or harvesting of seabirds and their eggs illegal – although this was never brought to the attention of the public (Turner, 2015). Five months after NL had officially become Canada's tenth province, The Twillingate Sun was the first public source to acknowledge the changes to the hunt with its October 1st article, "TURRible Law Applies" (p.4), in which readers were advised that "For the first time in the history of this ancient settlement, the old warning to the children, "look but don't touch" will apply to grown men who cast a longing eye on migratory non game birds" (The Twillingate Sun, 1949, p.4; Turner, 2015).

After learning about the laws that came into action along with confederation, serious pushback from the province propelled the federal government to give the murre hunt in NL a political accommodation in 1956 which ultimately resulted in a murre hunt that was legal but heavily unregulated (Turner, 2015). Without the federal government having taken the time or resources to establish bag limits, possession limits or hunting season lengths, the murre hunt lacked regulations from the 1950s to the 80s before technological advancements increased the efficiency of hunting equipment, raising new sustainability concerns amongst wildlife and conservation officials. With sustainability becoming an increasing concern, the federal government revisited the terms of the Migratory Bird Treaty in the 1990s to address the legality

of the hunt in NL as well as to outline regulations for the hunt. The first set of federal regulations for the province's murre hunt was established in 1993 (Turner, 2015). By the year 1999, the murre hunt in NL was recognized federally and internationally in *the Protocol Between the Government of Canada and the Government of the United States of America Amending the 1916 Convention Between the United Kingdom and the United States of America for the Protection of Migratory Birds in Canada and the United States* (Government of Canada, 1999). Even after imposing robust bag limit, possession limit, and season length regulations on the hunt, issues with illegal murre harvesting still prevailed, and ultimately resulted in “both domestic and international pressure on Canada to reduce it” (Cox et al., 2024, p.3).

3.1.1 Existing Literature on Murre Hunting Policy in NL

Very few studies exploring murre hunter opinions in NL have been conducted. CWS conducted opinion surveys in the late 1980s and early 2010s (Chardine, 1994; Environment Canada, 2010). These studies also sought to explore murre hunter perceptions and attitudes towards hunting regulations. In 1994, Chardine reported on a CWS hunter survey distributed in 1988 which had the goal of exploring three main objectives “1) to assess hunters' satisfaction and preferences regarding hunting seasons and bag limits, 2) to determine hunters' opinions on possible options to change regulations if harvest reductions are necessary and, 3) to categorize hunters' perceptions of the most common problems in the management of game bird hunting” (Chardine, 1994, p.2). A nearly identical study was conducted in 2010 by Environment Canada (now ECCC) which also sought to assess hunters' satisfaction and preferences regarding hunting seasons, bag limits, and regulation changes (Environment Canada, 2010).

In 2005, Gilchrist et al. (2005) published an article which emphasized the importance of using local ecological knowledge (LEK), or traditional ecological knowledge (TEK), in wildlife

management using migratory birds in the northwestern Atlantic and Arctic Oceans as a case study. This case study identified Indigenous residents as their sample and ultimately aimed to assess LEK of four migratory bird species (including murre) and compare these findings with quantitative scientific data (Gilchrist et al., 2005). While Gilchrist et al., recognize Indigenous populations as having “knowledge and insight acquired through extensive observation of an area or species” (Huntington, 2000, p.2), it is also stated that the authors “acknowledge that similar ecological information also exists for these marine birds among nonaboriginal people living in Newfoundland and Labrador, Canada” (Gilchrist et al., 2005, p.2). Although Gilchrist found that LEK is not always accurate when reporting on species numbers, it was found that LEK can still provide substantial insight on hunting conditions that can inform wildlife management and provide an additional resource through which wildlife officials can gather localized data. These findings emphasize the significance of hunter knowledge and highlights the importance of gathering data on hunter perspectives in addition to collecting biological species data.

More recently, in 2022, a study by York University master’s student Wayne Humphries, also explored the idea of informing resource management using LEK of murre hunters in Bonavista Bay (Humphries, 2022). Humphries’ study was focused on the biological dimensions of the hunt using citizen science but also presents the argument that hunting murre is perceived as a “historic right” as “most hunters felt that a historical right emanated from a history of hunting for generations that was intertwined within the current lifestyle of rural NL residents” (p.21). The 2022 study also reports that, although hunters often questioned the purpose of certain hunting regulations, they were ultimately supportive of enforcement initiatives (Humphries, 2022).

In 2024, Cox et al. published *Canadian murre harvest management in the face of uncertainty: a potential biological removal approach*, which explores the possibility of analyzing changes in murre populations by collecting data about the total species losses. Additionally, this article discusses the magnitude of illegal murre harvesting and sales, and the threat that these illegal activities impose on sustainability initiatives (Cox et al., 2024). Given that NL is the only jurisdiction in North America with a non-Indigenous harvest of murre, it is of utmost importance that the hunt is regulated to be sustainable. With enforcement officers and hunters both reporting high rates of illegal murre harvesting, the sustainability of the hunt is being threatened (Cox et al., 2024).

3.1.2 Current Hunting Regulations

Regulations regarding the possession and harvesting of murre in NL are clearly outlined for hunters and can be easily accessed by both the ECCC and the NL Government websites. These regulations are to stay in place until an amendment is put forth to change regulations or CWS invokes an emergency closure of the murre hunt on a local or province-wide scale if conditions lead to excessive harvest (Government of Newfoundland & Labrador, 2024a). Under current Migratory Game Bird Hunting Regulations, hunters can harvest a total of 20 murre per day and can be in possession of 40 murre including those that have been preserved (Government of Newfoundland & Labrador, 2024a). Furthermore, there are strict guidelines outlining the proper treatment of harvested murre including restrictions on abandoning migratory game bird meat, and rules surrounding the selling or gifting of migratory game bird meat to another person (Government of Newfoundland & Labrador, 2024a).

3.1.3 Problem Statement

The murre hunt in NL presents a unique case of natural resource management. Residents of the province are permitted to hunt this migratory bird species despite rising global concerns about the conservation of migratory seabirds. Although regulation of the province's murre hunt has been formalized for decades, there is a constant need to incorporate the human dimension into the regulation setting process. Reports of illegally disposed of and crippled birds as well as the illegal sale of murre have been recognized as just some of the issues perpetuating public concern for the hunt (Bailey, 2016; Mercer, 2019; CBC, 2021). With no signs of NL's murre hunt closing anytime soon, there is a need to understand how Migratory Bird Hunt Permit holders perceive current hunting regulations and if perhaps management challenges within these regulations can be observed.

3.1.4 Purpose Statement

The objective of this chapter is to demonstrate murre hunter perspectives and attitudes towards current hunting regulations in NL. To gain an understanding of the human-wildlife conflicts resulting from the murre hunt, this chapter will address the knowledge gap as to whether hunters are dissatisfied with current hunting regulations. By approaching this study with a HDWR framework, the legal and regulatory dimensions of NL's murre hunt will be explored. The results of this study will serve as a resource for future researchers and policymakers wishing to understand the perspectives and attitudes of murre hunters regarding the legal dimension of NL's murre hunt.

3.2 Methods

3.2.1 HDWR: Legal Dimension

A portion of this study was dedicated to understanding how murre current hunters perceive current hunting regulations as they are outlined in the MBCA. To analyze this, survey

questions were designed to explore the legal dimensions of the murre hunt in NL. Developing questions to fit the temporal scales included within the HDWR framework meant that survey participants were not only asked about current regulations but also how they would feel about possible future amendments to hunting regulations.

3.2.2 Survey Design and Administration

Data was collected through the distribution of anonymous online and mailed surveys that included close-ended questions which addressed various social dimensions of the murre hunt. This section will concentrate on those survey items focused on the legal dimension of the murre hunt. The survey design allowed respondents to remain anonymous to comment on perceptions of illegal activities and provided participants with the opportunity to honestly and individually think through answers about their own hunting experiences when completing the survey. Questions were designed to analyze hunter perspectives, attitudes and values (PAV) towards murre hunting regulations in NL. These questions explored topics including murre populations, harvesting regulations, National Harvest Surveys (NHS), and regulation enforcement.

3.2.3 Data Analysis

Once participants completed their survey, responses were input into a Google Sheets document. Survey data were analyzed using descriptive statistics. To identify the attitudes of murre hunters in response to hunting regulations, there was an analysis of survey responses to questions regarding participants' agreement with statements about the legal and regulatory dimensions of the murre hunt.

3.3 Results

Hunters were asked their perception of current migratory bird hunting regulations pertaining to murre. This section of the paper will present the results of the close-ended,

regulation-related questions answered by survey participants. The goal of this research was to explore murre hunter PAV towards current hunting regulations such as season length and bag limits. To gain an understanding of these perspectives and attitudes, seventeen statements were included in Section B: Murre Management. The results of these 17 statements were organized into smaller groups based on theme and are presented below (see Table 2 below).

3.3.1 Murre Population

When asked about murre populations, survey respondents reported that they perceived current murre populations as healthy. Over half of the survey respondents agreed that there is a healthy murre population. Additionally, respondents disagreed that murre populations were over or under-abundant (see Table 2 below). When asked about managing murre populations, survey respondents agreed that murre populations should be managed to benefit the residents of NL, but also agreed that if a species is endangered it should be protected (see Table 2 below). When asked about the threats facing murre populations in NL, nearly half of respondents felt that murre populations are environmentally threatened (i.e. by habitat loss and oil spills), however, respondents were also mostly undecided or neutral when asked about the effects of climate change on murre (see Table 2 below).

Table 2*Survey responses to murre population questions*

	Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	There is a healthy murre population.	Frequency: 4 2.6%	Frequency: 8 5.2%	Frequency: 43 27.9%	Frequency: 63 40.9%	Frequency: 36 23.4
2.	There is an overpopulation of murre.	Frequency: 16 10.4%	Frequency: 79 51.2%	Frequency: 50 32.2%	Frequency: 7 4.5%	Frequency: 2 1.3%
3.	There is an underpopulation of murre.	Frequency: 11 7.1%	Frequency: 58 37.7%	Frequency: 62 40.3%	Frequency: 15 9.7%	Frequency: 8 5.2%
4.	We should manage murre populations so that we can benefit from it.	Frequency: 2.6% 4	Frequency: 3 1.9%	Frequency: 18 11.7%	Frequency: 73 47.7%	Frequency: 56 36.1%
5.	It is important to protect endangered species.	Frequency: 15 9.7%	Frequency: 0 0%	Frequency: 3 1.9%	Frequency: 64 41.6	Frequency: 85 55.2%
6.	Murres are environmentally threatened (i.e. habitat loss, oil spills, etc.).	Frequency: 15 9.7%	Frequency: 40 26.0%	Frequency: 34 22.1%	Frequency: 50 32.2%	Frequency: 15 9.7%
7.	Murres are being impacted by climate change.	Frequency: 10 6.5%	Frequency: 25 16.2%	Frequency: 70 45.5%	Frequency: 39 25.3%	Frequency: 10 6.5%

3.3.2 Harvesting Regulations

Hunters were asked how many days they spend hunting murre each year with responses ranging from one to 25 days, with most respondents reporting that they will spend about two days hunting on average. When asked if they were satisfied with the length of the hunting season for murre, over three-quarters of survey respondents agreed that they were satisfied with the length of the hunting season (see Table 3 below). Hunters were also asked how many murres were hunted per day during past seasons with responses ranging as low as two murres and as high as five hundred murres. When asked if they were satisfied with the current bag limit, over half of the survey respondents agreed that they were satisfied with the current bag limit for

hunting murre (see Table 3 below). Overall, over half of the murre harvesters who participated in the survey disagreed that the hunt needs to be decreased through lowering season limits, bag limits, or shortening season length (see Table 3 below).

Table 3*Survey responses to regulation questions about season length, bag limits, and murre harvesting*

	Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I am satisfied with the length of the hunting season for murre.	Frequency: 6 3.9%	Frequency: 16 10.4%	Frequency: 9 5.8%	Frequency: 84 54.5%	Frequency: 39 25.3%
2.	I am satisfied with the current bag limit for hunting murre.	Frequency: 6 3.9%	Frequency: 13 8.4%	Frequency: 30 19.5%	Frequency: 63 40.9%	Frequency: 41 26.6%
3.	I think that the murre harvest should be decreased.	Frequency: 40 26.0%	Frequency: 58 37.7%	Frequency: 22 14.3%	Frequency: 24 15.6%	Frequency: 10 6.5%

The majority of respondents perceived the reduction of illegal harvest as being crucial to rebuilding murre populations if they were to decrease (see Figure 9 below). Although survey participants were given six management options to choose from, some participants opted to suggest their methods to rebuild murre populations if they were to decrease. Multiple survey participants commented that an increase in regulation enforcement should be the priority approach, stating that “There should be more restrictions on how many trips made per boat” (anonymous survey participant, personal communication, August 2024) and that enforcement

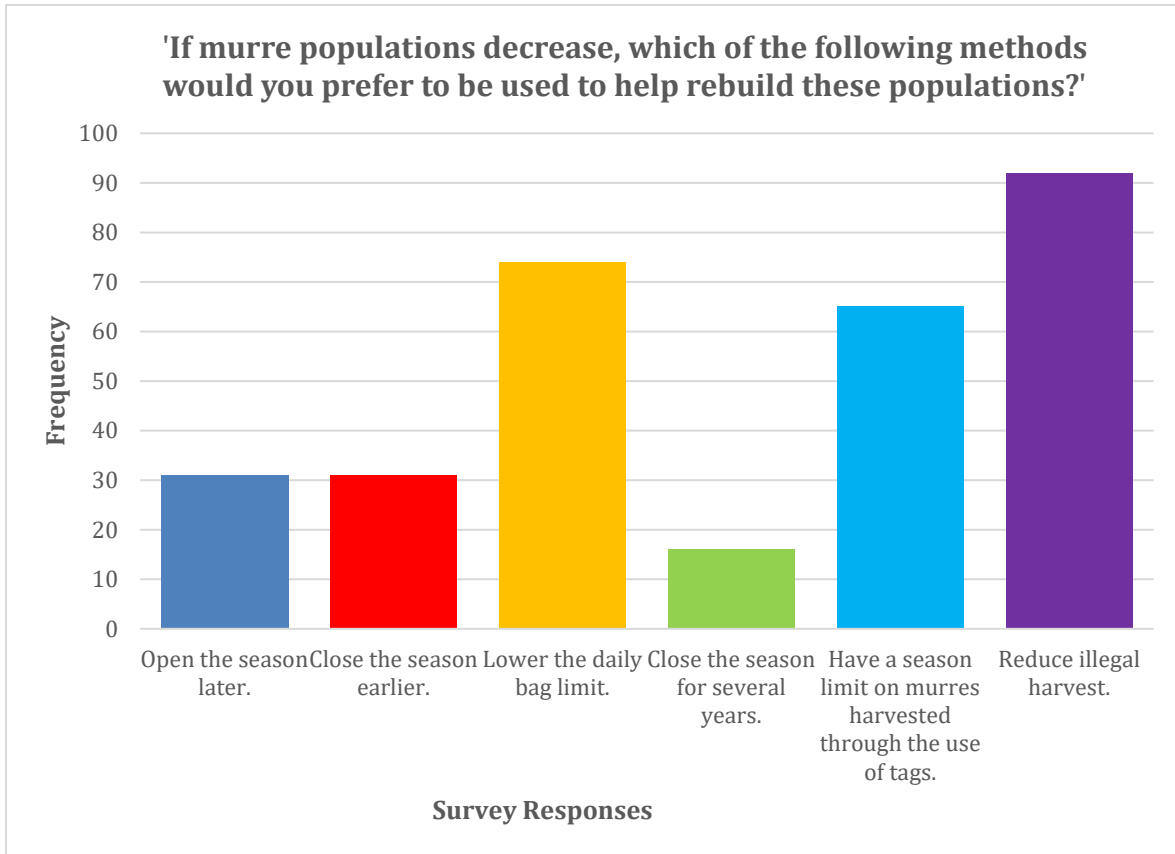


Figure 9: Bar Graph Displaying Survey Responses 'If murre populations decrease, which of the following methods would you prefer to be used to help rebuild these populations?'

needs to “Crack down on folks going out multiple times a day to catch their bag limit more than once” (anonymous survey participant, personal communication, August 2024).

A tagging system is a wildlife management tool that includes the process of individually numbered metal tags being distributed to hunters to ensure that hunters stay within the regulated bag limit. When asked if they were in support of a tagging system for murre, it was found that survey respondents supported a tagging system for murre. While about 50 participants reported that they would not be willing to pay any additional fees to implement the system, there was nearly an equal amount of participants who reported that they would pay an additional \$10-\$30 to implement a tagging system (see Figure 10 below).

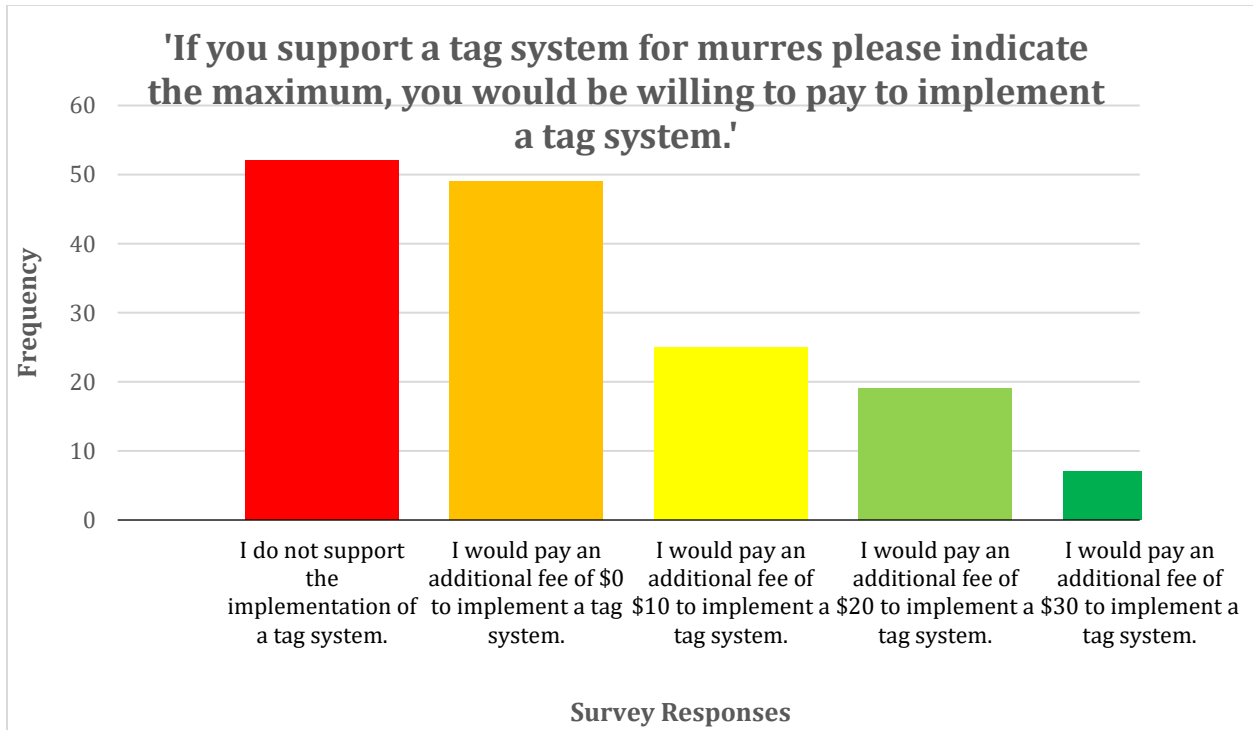


Figure 10: Bar Graph Displaying Survey Responses to 'If you support a tag system for murrens please indicate the maximum, you would be willing to pay to implement a tag system.'

Possession limits are intended to regulate the amount of murre that a hunter can have in their possession. The current possession limit for murre is 40 with no limit on the number of Murrens that a hunter can harvest in the season if they do not exceed 40 birds in their possession at any given time (Government of Newfoundland & Labrador, 2024a; ECCC, 2024). Hunters were asked how many murrens they hunted during the 2023-2024 season with responses ranging from three to 90 murre. When asked if they would prefer a season limit of 10, 20, 40, 60 or 80 murre, over half of the survey respondents reported that they were satisfied with a season limit of 40 murre which is the current possession limit (see Figure 11 below). In comparison, survey respondents were less supportive of a season limit above or below the current possession limit

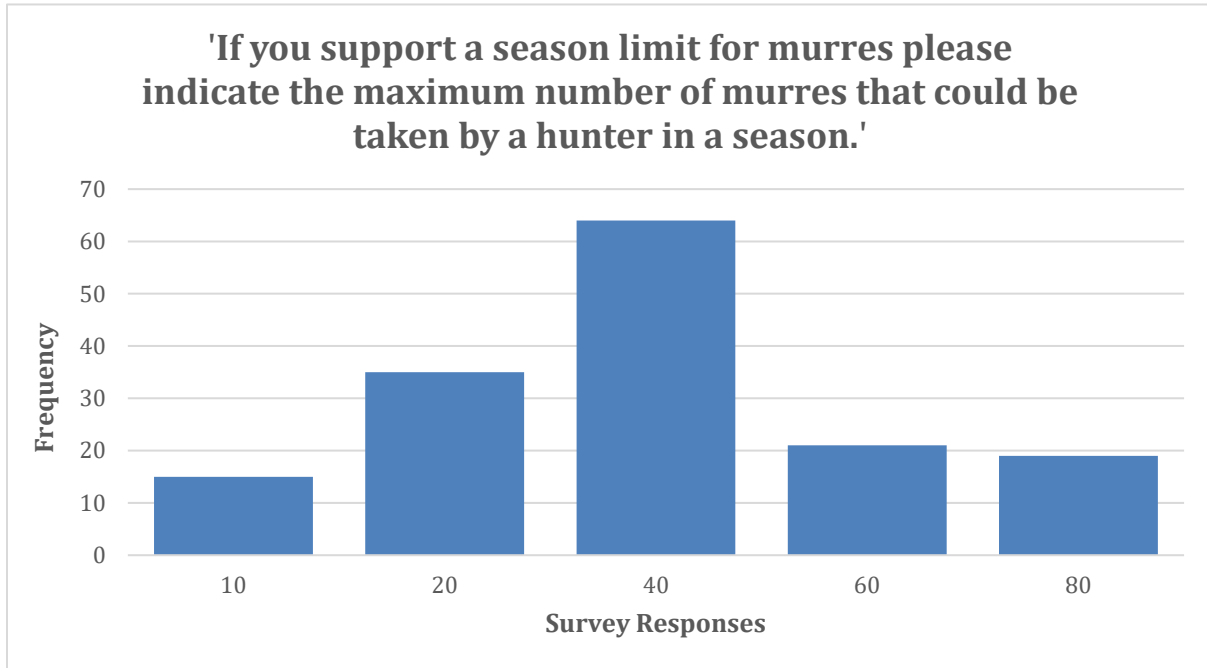


Figure 11: Bar Graph Displaying Survey Responses to 'If you support a season limit for murre please indicate the maximum number of murre that could be taken by a hunter in a season.' Note: The current possession limit is 40.

Bag limits regulate the amount of murre that can be harvested in a single day by a hunter. The current bag limit for murre is 20 per day (Government of Newfoundland & Labrador, 2024a). Hunters were given the option to select if they would prefer a bag limit of ten, twenty, thirty, forty or eighty murre per day. It was found that the majority of survey respondents supported the current daily bag limit of twenty murre per day (see Figure 12 below).

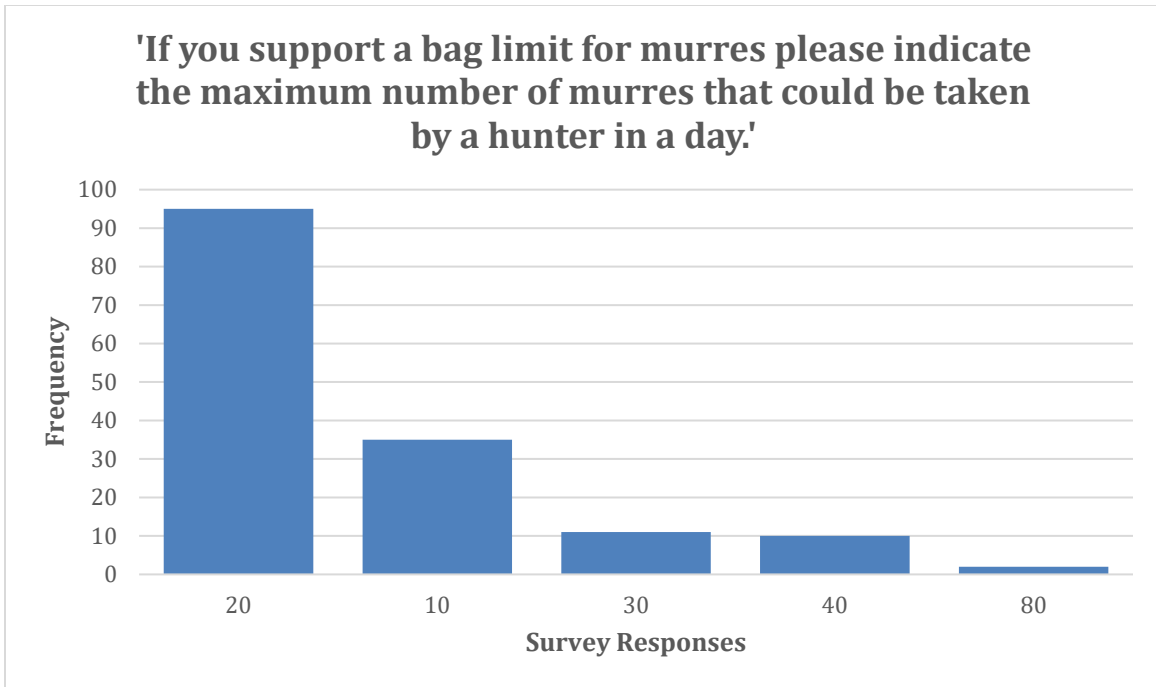


Figure 12: Bar Graph Displaying Survey Responses to 'If you support a bag limit for murrens please indicate the maximum number of murrens that could be taken by a hunter in a day'. Note: The current bag limit is 20.

3.3.3 National Harvest Survey

Each year, residents in possession of a Migratory Game Bird Hunting Permit (MGBHP) are asked to participate in the NHS. The survey is composed of two sections, the Harvest Questionnaire Survey (HQS) and the Species Composition Survey (SCS) (see Figure 13 below). These surveys are designed to acquire data on hunted migratory bird species to better inform resource management and hunting regulations (Government of Canada, 2017). The HQS aims to gather information on hunting activities while the SCS gathers information on species hunted through the submission of wings of hunted birds. As the data obtained from these surveys inform regulations and management, there is a need to understand how hunters perceive these surveys

and if perhaps there is a way to increase survey response rates. Survey questions were included in this study to gather data on hunter PAV towards the NHS.

REMOVE PROTECTIVE PAPER AND SEAL ENVELOPE
ENLEVEZ LE PAPIER PROTECTEUR ET SCHELZ L'ENVELOPPE

ATTENTION HUNTERS !
 1. For each bird, insert ONE inner (paper) envelope in ONE plastic envelope and follow instructions below.
 2. Affix address label in the space provided below. If you don't have any, please fill in your name and address using a BALLPOINT PEN.
 3. Write your current permit number (# 8) and fill in information in sections # 9 and # 10 using a BALLPOINT PEN.
 4. Return the envelope(s) as soon as possible. Thank you for your participation !

ATTENTION CHASSEURS !
 1. Pour chaque oiseau, insérer UNE enveloppe interne (papier) dans UNE enveloppe de plastique et suivre les instructions ci-bas.
 2. Placez une étiquette dans l'espace prévu. Si vous n'en avez pas, veuillez inscrire votre nom et adresse avec un STYLO À BILLE.
 3. Écrivez votre numéro de permis actuel (point 8) et rapportez l'information sur vos prises aux points 9 et 10 en utilisant un STYLO À BILLE.
 4. Expédiez l'enveloppe(s) le plus tôt possible. Merci de votre participation !

FOR ADDITIONAL ENVELOPES, RETURN THE YELLOW POSTCARD OR WRITE TO:
 Canadian Wildlife Service, NWRC, 1125 Colonel By Drive, Ottawa, ON, K1A 0H3
 Do not include postmark or correspondence in the wing envelope.
POUR RECEVOIR DES ENVELOPPES ADDITIONNELLES, VEUILLEZ RETOURNER LA CARTE POSTALE JAUNE OU ÉCRIRE AU:
 Service canadien de la faune, CNRP, 1125 chemin Colonel By, Ottawa, ON, K1A 0H3
 N'envoyez ni lettre ni carte dans l'enveloppe servant à emballer l'oiseau ou la queue.

BANDED BIRDS / OISEAUX BAGUÉS
 Please report banded birds
 1-800-327-BAND (2263)
 or online at: www.reportband.gov
 Veuillez signaler les oiseaux bagués
 1-800-327-BAND (2263) ou
 en ligne: www.reportband.gov

PLACE IDENTIFICATION LABEL HERE
PLACEZ L'ÉTIQUETTE D'IDENTIFICATION ICI

4. NAME OF HUNTER
 NOM DU CHASSEUR _____

5. ADDRESS
 ADRESSE _____

6. TOWN
 VILLE _____

7. PROVINCE _____

8. Your Canada Migratory Game Bird Hunting Permit Number.
 Votre numéro de Permis Canadien de chasse aux oiseaux migrateurs considérés comme gibier.
 Yes/oui No/rien Permis Number/numéro de permis

9. Date Shot / Jour abattu: Day/Jour _____ Month/Mois _____ Date received / Internal use only

10. In the box (TOWN), print the name of the town (and check the province) nearest to the place where you shot this bird.
 Dans la boîte (LOCALITÉ), inscrivez le nom de la localité (et cochez la province) la plus proche de l'endroit où vous avez abattu l'oiseau.
 Dans un des cercles, inscrivez la distance en kilomètres entre cet endroit et la localité.

TOWN - LOCALITÉ

1 NORTH NORD
 2 NORTHEAST NORD-EST
 3 EAST EST
 4 SOUTHEAST SUD-EST
 5 SOUTH SUD
 6 SOUTHWEST SUD-OUEST
 7 WEST OUEST
 8 NORTHWEST NORD-OUEST

NI, T.N. at Lac. Manitoba
 P.E.I. / I.P.E. Saskatchewan
 N.B. / N.B. Alberta
 N.S. / N.S. S.C.-C.B.
 Que. / Qué. N.W.T.-T.N.-O.
 Ontario Yukon
 Nunavut

Molt / Internal use only
 Wing Length / Internal use only

061-1703-4 (March 2016) Environment and Climate Change Canada / Environnement et Changement climatique Canada

Figure 13: National Harvest Survey from ECCC

When asked “Have you participated in the National Harvest Survey (license returns) by submitting wings?”, the majority of survey respondents answered ‘No’ (see Figure 14 below). Additionally, when asked, “If you declined to participate in the National Harvest Survey (license returns) by submitting wings, what were the reasons?”, respondents reported that they were either not applicable for the survey (i.e. they were not asked to participate, first hunting season, etc.), it was an inconvenience or felt that it was a waste of time. Furthermore, when asked, “Have you participated in the National Harvest Survey by submitting information on your hunting activity and success?”, two-thirds of respondents answered that they had not submitted information on their hunting activity (see Figure 14 below). Similarly, when respondents were

asked why they did not participate, it was found again that the survey was not applicable, a lack of time, and an inconvenience.

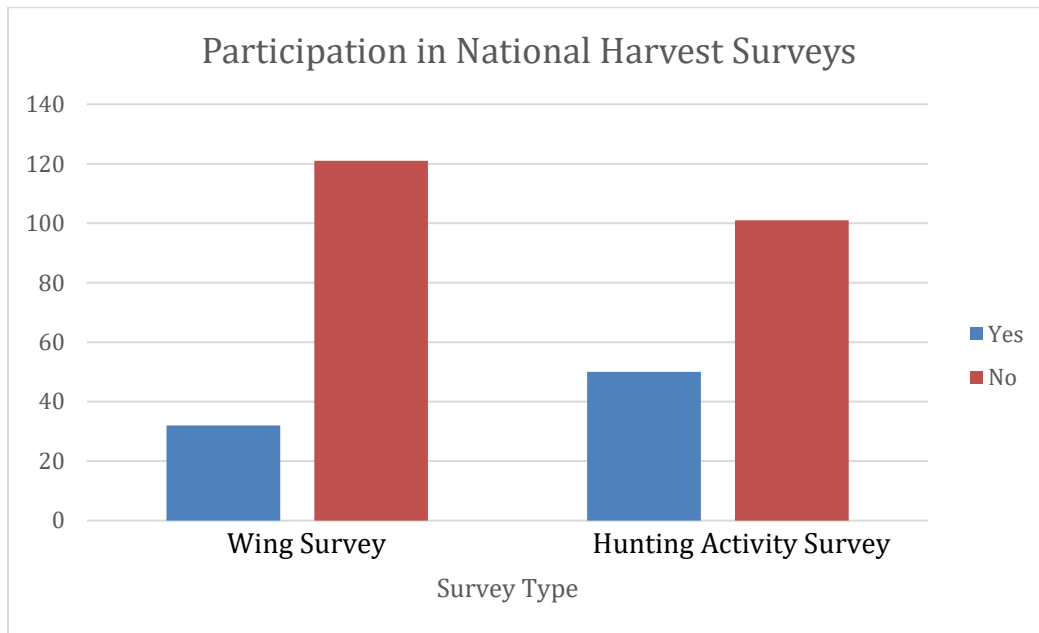


Figure 14: Survey Responses to 'Have you participated in the National Harvest Survey (license returns) by submitting wings?' or 'by submitting information on your hunting activity and success?'

3.3.4 Regulation Enforcement

Regulation and enforcement initiatives are at the crux of maintaining a sustainable murre hunt. Enforcement officers are permitted to perform random checks on murre hunters to ensure that they are abiding by regulations. When asked about their experience with hunting enforcement in the last five years, over seventy percent of survey respondents reported that they had never been checked by enforcement (see Figure 15 below).

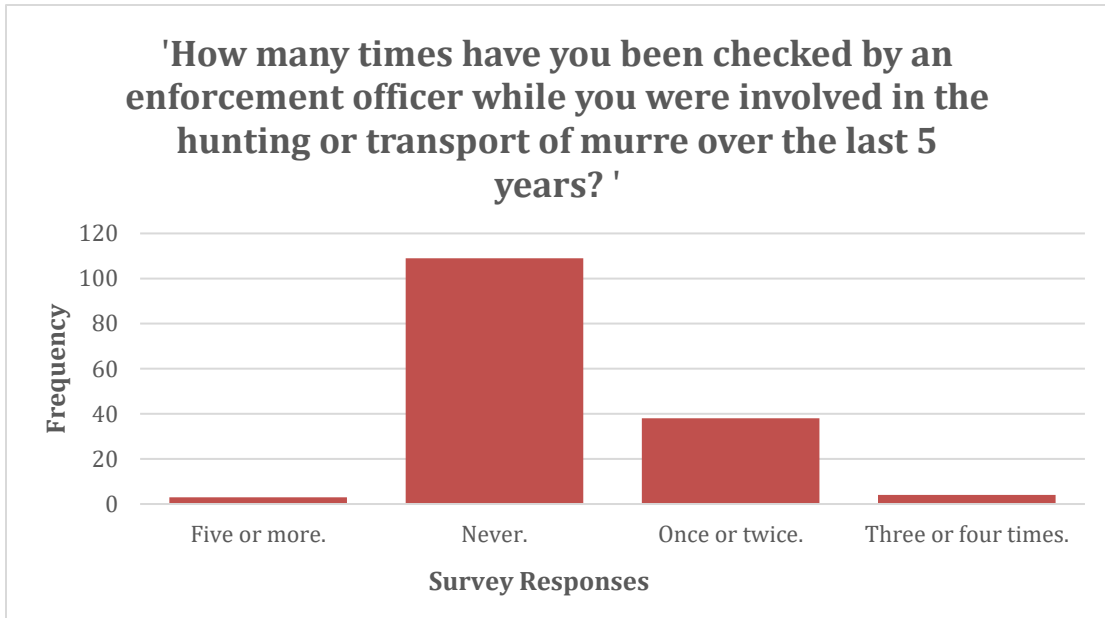


Figure 15: Bar Graph Displaying Survey Responses to 'How many times have you been checked by an enforcement officer while you were involved in the hunting or transport of murre over the last 5 years?'

Of those respondents who did report having been checked by enforcement in the last five years, it was the Provincial Wildlife Division that performed more checks than CWS and the Royal Canadian Mounted Police (RCMP) (see Table 4 below).

Table 4

Survey Responses to 'Which of the following officers were you checked by?'

Which of the following officers were you checked by? (Check all that apply.)		
	Frequency	Percent (%)
I was never checked	107	69.5
Provincial Wildlife Division	21	13.6
Unsure	11	7.1
Canadian Wildlife Service	7	4.5
Canadian Wildlife Service, Provincial Wildlife Division	5	3.2
Royal Canadian Mounted Police, Provincial Wildlife Division	2	1.3
Royal Canadian Mounted Police	1	0.6
Total	154	100.0

Hunters were also asked how they felt about the current amount of regulation enforcement they had experienced in their area. It was found that respondents were divided almost equally in terms of how they perceived the level of enforcement in their area (see Table 5 below). Responses were divided between hunters feeling that enforcement was too low, and others who felt that it was just right.

Table 5

Survey Responses to 'How do you feel about the amount of migratory bird enforcement of all types (bag checks, boat checks, selling charges, etc.) in your area?'

How do you feel about the amount of migratory bird enforcement of all types (bag checks, boat checks, selling charges, etc.) in your area?		Frequency	Percent (%)
	It is too low.	77	50.0
Valid	It is just right.	72	46.8
	It is too high.	5	3.2
	Total	154	100.0

As there are many issues and concerns that have been recognized regarding the murre hunt, survey respondents were asked what they perceived to be the most common problem related to murre hunting in NL. When given a list of commonly recognized problems with the murre hunt, respondents ranked 'going over the allowed bag limit' and 'selling migratory birds' as being the most common (see Table 6 below).

Table 6

Survey responses to ‘Here are some common problems with migratory gamebird hunting in general. Please select what you feel is the most common problem related to murre hunting in Newfoundland and Labrador’ (Note: Numbers represent the total amount of participants that indicated that option as a problem)

Here are some common problems with migratory gamebird hunting in general. Please select what you feel is the <u>most common problem</u> related to murre hunting in Newfoundland and Labrador.	
Selling migratory birds	77
Going over the allowed bag limit	72
Not retrieving all crippled birds	38
Buying migratory birds	32
Using the open season for one species as an excuse to carry a gun to hunt other birds	26
Hunting migratory birds before the legal season	26
Hunting migratory birds without a license	23
Using unplugged shotguns	24
Shooting species that are protected	22
Hunting migratory birds after the legal season	21
Shooting flightless birds	12
Shooting migratory birds at night	9

Hunters were also asked for some specifics about their hunting habits. For example, hunters were asked about the type of shot they typically use when hunting murre (see Figure 16 below). In response, most hunters reported that they use lead shot when hunting murre. In comparison, the use of steel shot, or both steel and lead shot, was reported far less amongst respondents.

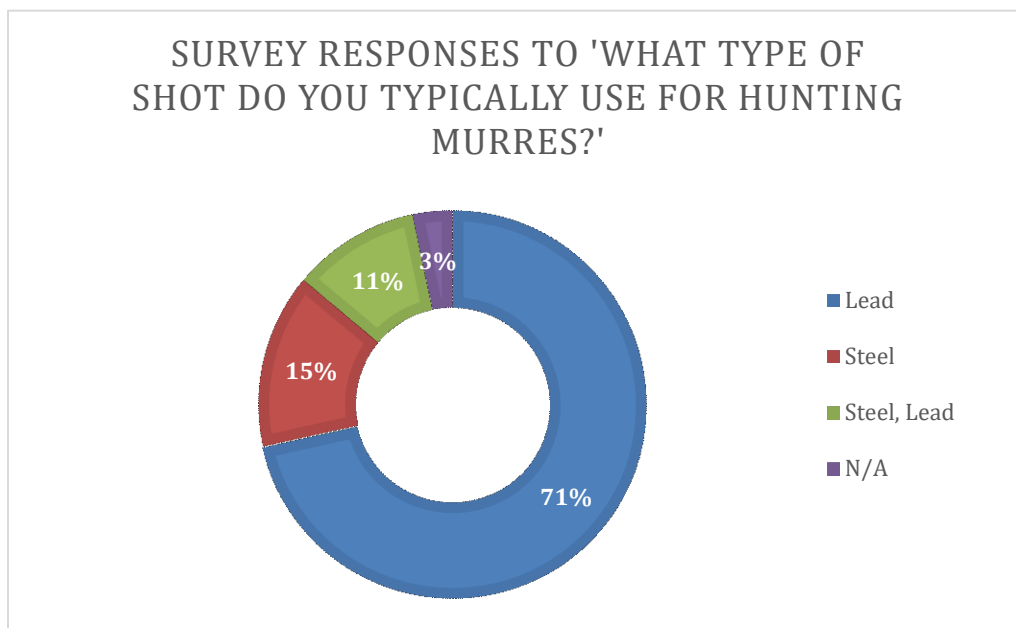


Figure 16: Pie Chart Displaying Survey Responses To 'What Type of Shot Do You Typically Use for Hunting'

Respondents also reported that on average, they will use about six 25-count boxes of ammunition during a murre hunting season.

3.4 Discussion

3.4.1 Importance of Effective Liaison

Murre harvesting regulations are designed to keep the hunt sustainable, therefore, understanding if hunters are satisfied with current hunting regulations can inform how regulations could be amended in the future to better suit hunters. Past researchers like Chardine (1994), recognized the importance of effective liaison between hunters and those organizations that establish and enforce regulations. Similar to Cox et al. (2024), when analyzing perspectives towards regulation enforcement, survey responses suggested that hunters are displeased with the current enforcement of hunting regulations. Humphries (2022) found that it was characteristic of hunters to question the legitimacy of government surveys and regulations. A possible explanation for this may be that many hunters reported in this study that they felt that regulation enforcement

in their area was lacking, indicating their displeasure with wildlife enforcement, and perhaps further explaining the disinterest observed in this study with hunter participation in annual NHS studies. An ongoing dialogue between hunters, policymakers and wildlife enforcement is fundamental to the effective establishment of sustainable murre hunting regulations. As suggested by Humphries (2022), although displeased with the current state of regulation enforcement, it was found that murre hunters in NL continue to be generally in support of hunting regulations in the province. To improve the perception that murre hunters hold towards regulation enforcement, it is suggested that regulation enforcement methods are intensified. One method of increasing regulation that was found to have support from hunters was the implementation of a tagging system. While some hunters did not agree with the implementation of a tagging system, and others were in support but found unwilling to pay an additional fee, there was a considerable portion of survey respondents who reported that they would be willing to pay an additional fee, upwards of \$30, to implement a tagging system.

Murre hunters can provide data on hunting conditions through LEK (Gilchrist, 2005; Humphries, 2022). As hunters have direct exposure to hunting areas, they can provide useful observations regarding species populations as well as environmental and human impacts on species hunted (Gilchrist et al., 2005; Humphries, 2022). With many hunters partaking in the murre hunt for multiple years, insight can be gained from individuals' experiences as to whether hunting conditions are changing from year to year. Additionally, the trends observed in this study support Humphries' findings that LEK may not always be a sufficient means of informing the murre hunt. Humphries' case study found that the hunter's LEK was not representative of the true conditions of the murre hunt when compared with the findings of wildlife officials (Humphries, 2022). For example, hunters in this study reported that murre populations are currently healthy

although this conflicts with recent studies reporting on the increased mortality of murre species as a result of the HPAI outbreak in NL (Humphries, 2022; Newfoundland & Labrador, 2024).

3.4.2 Past and Present Perspectives on Murre Hunting Regulations

Having analyzed hunter PAV regarding current hunting regulations, these findings can be compared with those findings of previous hunter surveys, like the NHS. Being able to compare these findings is beneficial as it can be observed whether hunter opinions are changing over time. Chardine (1994) explores the results of the *1988 Hunter Opinion Survey* (HOS). In 1988, a large sample of migratory bird hunters in NL (n=1847) were surveyed and produced a response rate of thirty-two percent (Chardine, 1994). In comparison, the survey analyzed in this study only produced a nine percent response rate. The survey respondents included in this study were more experienced in comparison to those hunters surveyed in 1988. On average, participants in the current study reported 30 years of hunting experience while participants in the 1988 study (Chardine, 1994) reported 17 years of hunting experience on average. This could be indicative of an aging population of murre hunters in the province. In 1988, survey respondents reported that they would be satisfied with a bag limit of 15 murre (Chardine, 1994) which is also comparable to today's hunters who are satisfied with a slightly larger bag limit of 20 murre. When asked about season limits, survey respondents in 1988 reported that they were satisfied with a season limit of 60 murre (Chardine, 1994). Although hunters in 1988 were satisfied with hunting less murre per day, they were in support of a higher season limit in comparison to today's hunters who are satisfied with a season limit of 40 murre. Like today's murre hunters, hunters in 1988 felt that murre populations were healthy, although about one-third of respondents felt that murre populations were declining at the time (Chardine, 1994).

3.4.3 Research Significance and Future Directions

This study focused on murre hunter PAV regarding current hunting regulations as a means of informing future policy and regulation amendments. As the murre hunt is a long ongoing annual occurrence in NL, the attitudes that hunters present throughout the years are changing. This study will help provide insight to federal and provincial wildlife authorities and policymakers on the status of how murre hunters are perceiving regulations. Effective liaison with the hunting population not only establishes communication between hunters and wildlife management but is also essential in guiding effective management (Chardine, 1994; Gilchrist, 2005). This study is important to ensure that future research on NL's murre hunt continues to maintain an understanding of murre hunter PAV.

Studying murre hunter PAV through a HDWR framework allows for varying human dimensions of the hunt to be explored. Using the dimensions outlined in the framework creates a holistic understanding of how humans are interacting with the species throughout time (Bath, 1998). It is recommended that future research on the murre hunt integrate a HDWR framework as this will support an ongoing dialogue between hunters and researchers which has been observed as being essential to understanding the ever-evolving relationship between hunters and murre. HDWR studies have been recognized for their successful management solutions and therefore present great potential in remedying human-wildlife conflicts (Bath, 1998; Pimid et al., 2022; Serota et al., 2023).

3.4.4 Recommendations

Having gathered murre hunter PAV on existing hunting regulations and conditions, some insights were gathered, and recommendations were formulated as a means of guiding future amendments to the MBCA.

3.4.5 Regulations

Having addressed the concerns reporting murre mortality and HPAI in NL in 2022 and finding that it was the Common Murre that was impacted, as opposed to the more popularly hunted Thick-billed Murre, the following recommendations were made. It was observed that most hunters are satisfied with the current possession limit of 40 murre and would be satisfied with a season limit of 40 murre. Additionally, the majority of hunters were also content with a bag limit of 20 murre. Keeping these findings in mind, it is recommended that the current season and bag limits for the murre hunt remain the same unless deemed unsustainable in the future by CWS. As suggested by Humphries (2022), it is characteristic of murre hunters to agree with regulation enforcement which is further supported by the observation that hunters feel it is important to manage murre populations for human benefit and that it is important to protect species if they become threatened. When asked about how to aid murre populations if their numbers were to decline, many hunters felt that going over the allowed bag limit, and the buying/selling of migratory birds were the biggest threats facing murre and that focusing on the reduction of the illegal harvest was the best approach to improve murre populations. These findings suggest that murre hunters rely heavily on regulation enforcement to implement effective wildlife management and keep the hunt sustainable.

3.4.6 Regulation Enforcement

It was found that survey respondents reported migratory bird regulation enforcement being too low. It is recommended as a general guide to increase wildlife enforcement in all popular murre hunting areas to address these concerns with a particular emphasis on increasing the surveillance on the buying/selling of murre. Furthermore, most survey respondents reported that they had never been checked by any form of wildlife enforcement in the past five years. The

presence of wildlife enforcement should be increased in bays throughout NL to mitigate the illegal activities that have been identified by hunters and authorities as being problematic to the hunt (i.e. buying/selling birds, going over the allowed bag limit, etc.). One method to increase enforcement of the murre hunt would be through the implementation of a tagging system that required hunters to affix harvested murre with specific tags that were issued to the hunter. Through applying a tagging system, wildlife officials in the province will be granted the ability to more effectively enforce bag/season limits as well as be better equipped to address concerns regarding the illegal buying/selling of murre.

This study also revealed that 71% of murre hunters in NL only utilize lead shot, when hunting murre. Although legal for hunting murre, lead has been recognized by the Canadian government as being toxic for human ingestion and the environment (Government of Canada, 2024). As outlined in the 2024 MBR hunting regulations, it is legal for murre hunters to possess and use lead shot for hunting murre although it is prohibited when hunting other gamebird species such as ducks and geese. Because of the popularity reported by hunters to use lead shot, it is suggested that murre hunters are educated on the dangers of using lead shot thereby encouraging more hunters to use non-toxic shot such as steel.

Hunters were also asked about their participation in the NHS, and it was observed that most hunters do not partake in the annual survey. Because hunters viewed the NHS as a waste of time, it is suggested that hunters be given incentives to increase participation. For example, hunters may not perceive the survey as being such an inconvenience if they were to receive some form of compensation for their participation. Involvement in the NHS may increase if hunters are rewarded for their time with hunting materials such as ammunition or items that can be used to display participation in the hunt such as an embroidered hat or a patch. Additionally, the NHS is

only distributed to a sample of the province's murre hunting population. To increase future participation, it is recommended that all hunters are given the opportunity to participate. This could be accomplished through distributing the survey along with MGBHP each year. Another option to increase participation in the NHS would be to make survey completion mandatory for hunters. A way to enforce this would be through requiring MGBHP applicants to complete the NHS as a condition of acquiring a permit. Providing participants with follow-up communications is another method to increase participant involvement as individuals could provide additional information on their hunting experiences or feedback on the NHS. A follow-up program with participants also creates a sense of ongoing dialogue between hunters and wildlife officials which offers the advantage of having steadily available access to information. Allowing hunters to participate in follow-up programs occurring outside of the hunting season also increases the likelihood that hunters are not so preoccupied with the hunt that they do not have the time to participate in a survey.

4.0 CHAPTER 4: Summary

The findings presented above demonstrate how understanding local culture and hunter perspectives on wildlife management in NL is important for the successful and sustainable management of murre populations. NL's murre hunt represents a distinctive resource management challenge. Murre populations are not only subject to changing environmental conditions but anthropogenic impacts as well. In NL, anthropogenic impacts include a wide array of activities from the active offshore oil industry to the historic and culturally significant murre hunt. Understanding murre hunter perspectives in NL has been recognized as instrumental in maintaining effective management of the hunt (Chardine, 1994). Having addressed hunter PAV in this study, the findings can be utilized to inform future research and make recommendations for future policy amendments. HDWR has been established as an effective and informative tool in natural resource management (Bath, 1998; Serota et al., 2023). Having used a HDWR methodology to assess murre hunter perspectives in NL, these findings can be used to inform and adjust regulations to address and mitigate existing human-wildlife conflicts of the hunt.

However, there are limitations to this study and considerations for future research. Similar to the NHS, the response rate for this survey was low. This indicates the need to improve how officials communicate with hunters. Future studies should address this limitation by exploring various methods of observing hunter PAV and prioritizing HDWR studies. It would be beneficial to wildlife officials to research the best means of obtaining hunter perspectives. Allocating additional resources to recognize the strengths and weaknesses of various research methods, such as surveys, workshops or one-on-one interviews, would optimize the efficiency and success of hunter surveys. By establishing the ideal circumstances by which hunters prefer to share information, officials can increase response rates thereby increasing the data available and

improving the accuracy of findings. Furthermore, survey responses from the Labrador region were extremely limited. This affected the outcomes of this study as findings may not be fully representative of hunter perspectives in the Labrador region. Because of this, the observations discussed in this study are most applicable to communities in insular NL, which is where most of the harvest occurs due to weather and ice conditions. If this project were to be replicated in the future, this could be prevented by reaching out to specific residents in Labrador who have voiced interest in murre survey participation in the past. Although using this approach would impair the ability to use random sampling in the study, it would ensure that survey data is inclusive of all regions in the province. Another limitation of this study is that the survey did not include an additional comment section for survey participants to voice concerns not highlighted in the survey. This resulted in some survey participants asking for an opportunity to voice additional concerns elsewhere as well as other participants writing comments in empty spaces on the survey paper. If this study were to be replicated in the future, the survey distributed to hunters should include a comment section so that participants can include comments that they believe to be of importance to the murre hunt. Additionally, by consulting with hunters during the study and survey design, researchers could develop survey material that better addresses the needs and concerns of murre hunters.

This project documented the cultural dimensions of the murre hunt and hunter's perspectives on the regulation of the hunt. This project was necessary as it illustrated the cultural importance of the murre hunt to NL heritage as well as providing an updated report on hunter perspectives towards regulations. A goal of this study was to give murre hunters in NL an opportunity to tell how hunting murre contributes to NL culture and heritage. Effective liaison between wildlife officials and hunters is crucial to understanding the various dimensions of the

hunt, however, murre hunters in NL often feel that they do not often have their voices heard during times of decision-making.

This study also contributes to the broader field of HDWR studies by adding to the growing collection of work using this framework. The case of the murre hunt in NL acts as another human-wildlife conflict that has been assessed using perspectives outlined in the HDWR framework. Having focused mostly on the social and legal perspectives of the murre hunt, there are remaining perspectives in the HDWR framework that still require a more in-depth analysis such as the biological or technological perspectives. This study and its findings will be useful for future wildlife researchers in NL to reference as a guide and source when researching the province's murre hunt; also, it will be useful for CWS and policymakers to reference when making amendments to future regulations. Finally, this study will be made available for open access through MUN's online archives.

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Appendix A – NL Murre Survey

You are invited to take part in a research project entitled “*Human Dimensions of Newfoundland and Labrador's Murre Harvest.*”

Purpose of study:

This survey is intended to gather information on murrens and their environment in Newfoundland as well as hunter experiences and preferences.

What you will do in this study:

In this study you will be asked to complete a questionnaire about your murre hunting experience in Newfoundland & Labrador.

Length of time:

It will take approximately 30 minutes to complete the questionnaire.

Anonymity:

Anonymity is a desirable protection for participants. The sample size of this project is large, and all data collected (both virtually and physically) will be grouped together with the data of other participants to ensure that survey responses cannot be traced back to individual participants. None of the information collected here can or will be used to incriminate the participant or others.

Consent:

By completing this survey your consent to participate is implied.

What is implied consent?

With implied consent, participants indicate that they knowingly agree to participate in the study by completing a research activity (e.g., by completing a survey/questionnaire). It does not require a signed consent form (i.e., express consent), but it does require provision of information to research participants to make an informed choice.

Your submission of this survey means that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time prior to the submission of your survey.

The proposal for this research has been reviewed by the Grenfell Campus-Research Ethics Board and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the GC-REB through the Grenfell Research Office (GCREB@grenfell.mun.ca) or by calling (709) 639-2399.

Murre Hunter Preference and Observation Survey: Newfoundland and Labrador 2024

Introduction

My name is Hayley Myers and I am in the process of completing a Masters in Environmental Policy at Memorial University's Grenfell Campus. As part of my thesis, I am conducting research along with co-investigator and Master's student, Claire Brenton, under the supervision of Dr. Stephen Decker with funding provided by Canadian Wildlife Service.

The Canadian Wildlife Service of Environment and Climate Change Canada or Memorial University of Newfoundland is undertaking a survey to solicit the preferences and observations of murre hunters in Newfoundland.

We will use the word **murre** to refer to both the Thick Billed Murre (Northern Turr) that breeds in northern waters and the Common Murre (Newfoundland Murre) which breeds in Newfoundland waters.

In recent years there have been many questions raised around the practice of hunting murre in Newfoundland and Labrador and what the preferences of hunters are. For example, one suggestion has been to use a tag system and have a seasonal limit. This survey is intended to gather information on murre and their environment in Newfoundland as well as hunter experiences and preferences.

This survey is in addition to the National Harvest Survey or Species Composition Survey that you may also be asked to complete.

All information is confidential, and analysis will be done on all the responses summed together. Individual responses will not be identified. It is important that you provide factual and accurate information. To ensure anonymity, we ask that you please refrain from including your name (first or last) anywhere on the survey.

This survey can also be completed online by scanning the QR code to your right or by entering the following address into your browser:

<https://forms.gle/Uhz8aw9MG28QA1HH8>

Instructions:

For ranked questions:

Please mark an 'x' in the circle of your preferred response.

For Yes/No questions:

Please mark an 'x' in the circle of your preferred response.

For Written Response questions:

Print your response in the space provided.



To Return Completed Survey:

To have your responses recorded, please complete/return the survey by **July 1st, 2024.**

Fold the survey and place it inside the empty envelope that has been provided with your survey package. The recipient address and stamp are prefilled. **Please do not include a return address.** Finally, mail your survey at your local post office/box.

Thank you for your participation!

Section A: Cultural Questions	In this section, I would like to gather some information about how hunting murre impacts your lifestyle and culture.
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		Strongly Disagree	Disagree	Unsure/I Don't Know	Agree	Strongly Agree
1.	Hunting murre is important to my culture.					
2.	Hunting murre is an important source of income.					
3.	The murre hunt is important to the province of Newfoundland and Labrador.					
4.	Murre is a part of a traditional Newfoundland and Labrador diet.					
5.	Murre is an important food source for my family.					
6.	Hunting murre has been a tradition in my family for generations.					
7.	Hunting murre makes me feel connected to nature.					
8.	The murre hunt is a controversial topic in Newfoundland & Labrador.					
9.	It is important to me that future generations hunt murre.					

Section B: Murre Management	In this section I would like to learn about your perspectives on murre management in Newfoundland & Labrador.
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		Strongly Disagree	Disagree	Unsure/I Don't Know	Agree	Strongly Agree
10.	We should manage murre populations so that we can benefit from it.					
11.	I am satisfied with the length of the hunting season for murre.					
12.	It is important to protect endangered species.					
13.	The murre hunt is still as important as it once was.					
14.	Murres are environmentally threatened (i.e. habitat loss, oil spills, etc.).					
15.	Murres are being impacted by climate change.					
16.	I think that the murre harvest should be decreased.					
17.	There is a healthy murre population.					
18.	There is an overpopulation of murre.					
19.	There is an underpopulation of murre.					

20.	If murre populations decrease, which of the following methods would you prefer to be used to help rebuild these populations? (Check all that apply.)	
	Open the season later.	
	Close the season earlier.	
	Lower the daily bag limit.	
	Close the season for several years	
	Have a season limit on murres harvested through the use of tags.	
	Reduce illegal harvest.	
	Other (please specify):	

21.	If you support a season limit for murre please indicate the maximum, you would be willing to pay to implement a tag system (Check one circle only).	
	I do not support the implementation of a tag system.	
	I would pay an additional fee of \$0 to implement a tag system.	
	I would pay an additional fee of \$10 to implement a tag system.	
	I would pay an additional fee of \$20 to implement a tag system.	
	I would pay an additional fee of \$30 to implement a tag system.	

22.	If you support a season limit for murre please indicate the maximum number of murre that could be taken by a hunter in a season (Pick one answer only).	
	10	
	20	
	40	
	60	
	80	

23.	How many times have you been checked by an enforcement officer while you were involved in the hunting or transport of murre over the last 5 years?	
	Never	
	One to two times.	
	Three to four times.	
	Five times.	
	More than five times.	

24.	Which of the following officers were you checked by? (Check all that apply.)	
	Canadian Wildlife Service	
	Royal Canadian Mounted Police	
	Provincial Wildlife Division	
	Unsure	
	I was never checked.	

25.	How do you feel about the amount of migratory bird enforcement of all types (bag checks, boat checks, selling charges, etc.) in your area? (Pick one answer only)	
	It is too low.	
	It is just right.	
	It is too high.	

26.	Here are some common problems with migratory gamebird hunting in general. Please select what you feel is the <u>most common problem</u> related to murre hunting in Newfoundland and Labrador.	
	Hunting migratory birds without a license.	
	Shooting migratory birds at night.	
	Going over the allowed bag limit.	
	Hunting migratory birds before the legal season.	
	Hunting migratory birds after the legal season.	
	Shooting flightless birds.	
	Using unplugged shotguns.	
	Not retrieving all crippled birds.	
	Shooting species that are protected.	
	Using the open season for one species as an excuse to carry a gun to hunt other birds.	
	Selling migratory birds.	
	Buying migratory birds.	
	Other (please specify)	

Section C: Hunting Questions	In this section I would like to learn more about your murre hunting experience.
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		Strongly Disagree	Disagree	Unsure/I Don't Know	Agree	Strongly Agree
27.	I am confident in my ability to correctly identify murre.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28.	Did hunt murre during the 2023/2024 season?	
	Yes	
	No	

29.	If you hunted this past season, how many murre did you harvest during the 2023/2024 season? (Please skip this question if you did not hunt during 2023/2024.)	
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30.	Do you hunt every season?	
	Yes	
	No	

		Strongly Disagree	Disagree	Unsure/I Don't Know	Agree	Strongly Agree
31.	I am satisfied with the current bag limit for hunting murre.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32.	If you support a bag limit for murre please indicate the maximum number of murre that could be taken by a hunter in a day (Check only one box).	
	10	
	20	
	30	
	40	
	60	
	80	

33.	Please list the closest communities where you hunt murre. Please list all that apply.

34.	Thinking back to past seasons, how many days do you normally hunt murre a year?	
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35.	The current daily bag limit for murre is 20 per day per hunter. What percentage of the days did you get a daily bag limit in 2022-23 season? Indicate the correct percentage.	
	0%	
	25%	
	50%	
	75%	
	100%	

36.	Thinking back to past seasons, how many murre were hunted per hunter in a day? (Please provide an approximate number.)	
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37.	What percentage of trips would you hunt both murre and sea ducks?	
	0%	
	25%	
	50%	
	75%	
	100%	

38.	What type of shot do you typically use for hunting murre? (Check all that apply.)	
	Lead	
	Steel	
	Other (Please specify):	

39.	How many boxes of shells (25 count boxes) would you typically use <i>in a season</i> when hunting murre? (Please provide an approximate number of the total boxes used.)	
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40.	Have you participated in the National Harvest Survey (license returns) by submitting wings?	
	Yes	
	No	

41.	If you declined to participate in the National Harvest Survey (license returns) by submitting wings, what were the reasons?	
	Lack of Time	
	Inconvenience	
	Concern over how the information would be used.	
	Not Applicable (i.e. you were not asked to participate, this is your first hunting season, etc.)	
	Other	

42.	Have you participated in the National Harvest Survey by submitting information on your hunting activity and success?	
	Yes	
	No	

43.	If you had declined to participate in the National by submitting information on your hunting activity and success what were the reasons?	
	Lack of Time	
	Inconvenience	
	Concern over how the information would be used.	
	Not Applicable (i.e. you were not asked to participate, this is your first hunting season, etc.)	
	Other	

Section D: Hunter Background	In this section, I would like to learn more about you and your hunting habits.
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44.	Do you participate in hunting outside of the murre hunt? (Moose, rabbit, bear, etc.)	
	Yes	
	No	

45.	How many years have you been hunting murrens?	
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46.	Who do you typically hunt murre with? (Check all that apply.)	
	Family	
	Friends	
	Other (Please specify):	

47.	How many people are typically in your hunting group?	
	1	
	2	
	3	
	4	
	More than 4.	

48.	To which age group do you, the survey participant, belong?	
	12-17	
	18-24	
	25-34	
	45-54	
	55-64	
	65+	

49.	Gender:	
	Female	
	Male	
	Other	

50.	Location (Community of current residence):	
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If you would you like to be contacted in the future to participate in discussions or meetings about murre management in Newfoundland and Labrador please contact nlmurrestudy@gmail.com.