The shared stories of people and plants:
Cultural and ecological relationships
between people and plants
in Makkovik, Nunatsiavut
(Labrador, Canada)

by

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Abstract

People and plants live in complex networks of cultural and ecological relationships. In northern Canada, plants are important to cultural practices, just as cultural practices shape plant communities. This research responds to research priorities identified by Makkovimiut, residents of the Inuit Community of Makkovik, Nunatsiavut (Labrador, Canada), on people-plant relationships (2012-2016). These priorities shaped the research objectives, which form the three central chapters of this integrated thesis: i) learning how to respectfully approach research on people-plant relationships in Makkovik; ii) learning about Makkovimiut relationships with plants; iii) learning about the effects of cultural practices on plant communities.

Chapter 2 details and evaluates approaches in Indigenous methodologies that guide the research. As a non-Indigenous student, I rooted research questions in personal meaning and community relevancy, which I sought to understand through preliminary research, the ongoing guidance of community advisors, and by going as a learner to Makkovimiut plant mentors. An iterative approach to learning helped build relationships with Makkovimiut plant mentors and plants.

Chapter 3 discusses Makkovimiut plant knowledge and practices. Plants support life and livelihood for Makkovimiut, and sustain cultural practices such as fishing, which reciprocally support plant communities. Plants are more than objects: plants are present in memory, well-being, and sharing, and have voices of their own. In actively managing—caring for—plants, Makkovimiut nurture the ecological and cultural values that create healthy communities for both people and plants. These values are expressed in the stories people tell about plants.

Chapter 4 explores how research in plant ecology helps voice the stories plants tell about people. The urban ecology of the North shows the lasting effects of metals, salt and wood in soils and plant communities of commercial fishing stations, while specific plants of family fishing places speak to a legacy of soil enrichment. When Makkovimiut cultural knowledge directs and interprets ecological research, the voices of plants and soils become stories that tell of enduring ecological footprints in this peopled northern landscape. Interdisciplinary research deepens our understanding of the shared stories of people and plants, and creates space for people and plants to enrich each other's stories.

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Nellie Winters
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Statement of Co-authorship and Permission

Chapters 2, 3, and 4 of this thesis are intended for eventual publication in refereed journals as co-authored articles. No materials have yet been submitted for publication.

The authors of each article have read and signed the following four statements outlining the role of Erica Oberndorfer as principal investigator and main author on each publication:

"As co-author of 'An Indigenous methodologies approach to understanding people-plant relationships in Makkovik' (Chapter 2), 'The stories people tell about plants – Makkovimiut plant knowledge in practice' (Chapter 3), and 'The stories plants tell about people – Ecological footprints of fishing practices near Makkovik' (Chapter 4), I, Gita Ljubicic, acknowledge Erica Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Gita Ljubicic, have contributed to the papers in this thesis as supervisor of Erica Oberndorfer during the doctoral program in geography. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis. These activities have been entirely consistent with the role of thesis supervisor.

As co-author of 'An Indigenous methodologies approach to understanding people-plant relationships in Makkovik' (Chapter 2), and 'The stories people tell about plants – Makkovimiut plant knowledge in practice' (Chapter 3), I, Carol Gear, acknowledge Erica

Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Carol Gear, have contributed to the papers in this thesis as the Makkovik Community Liaison Officer and as a Makkovimiut (resident of Makkovik) community research advisor. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis. These activities have been entirely consistent with the role of community research advisor.

As co-author of ‘The stories people tell about plants – Makkovimiut plant knowledge in practice’ (Chapter 3), and ‘The stories plants tell about people – Ecological footprints of fishing practices near Makkovik’ (Chapter 4), I, Jeremy Lundholm, acknowledge Erica Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Jeremy Lundholm, have contributed to the papers in this thesis as a member of Erica’s academic committee during the doctoral program in geography. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis, as well as providing code for statistical analyses and guiding analysis of ecological data. These activities have been entirely consistent with the role of thesis committee member.

As co-author of ‘The stories plants tell about people – Ecological footprints of fishing practices near Makkovik’ (Chapter 4), I, Todd Broomfield, acknowledge Erica Oberndorfer as the lead contributing author of this manuscript. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscript.

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These manuscripts represent significant contributions to our understanding of Makkovimiut cultural plant knowledge, the role of cultural practices in shaping northern plant communities and soils, and the critical guidance of Indigenous methodologies in interdisciplinary research. For these reasons we fully support the inclusion of these articles as components of Erica’s doctoral thesis."

Signed statements are included in Appendix WW.

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1 Chapter: Introduction

1.1 Thesis orientation

At its heart, this dissertation is about relationships between people and plants. In particular, it focuses on these relationships in a northern landscape, where plants have often been dismissed by visitors as being unimportant to local peoples. This work looks at the many ways that plants are important to people in the Inuit Community of Makkovik, in Nunatsiavut (“Our Beautiful Land”, the Labrador Inuit Land Claims Area; Figure 1). Makkovimiut (residents of Makkovik) encourage us to think of plants as more than useful objects, and to consider the importance of plants in cultural practices and values. These are the stories people tell about plants.

Makkovimiut are also important to plants. Though it may seem a remote and unpeopled place, the north coast of Labrador is crisscrossed with the ecological footprints of its peoples. Both intentionally and unintentionally, Makkovimiut help shape plant communities and soil conditions, thereby sculpting landscape through culture. These are the stories plants tell about people.

The stories of people and plants in Makkovik are shared stories. Relationships between Makkovimiut and plants show the reciprocity inherent in this arrangement. There is an understanding that people and plants care for each other. This understanding is reflected in the intertwined cultural and ecological systems that support both human and plant communities. This dissertation attempts to share some of the voices, human and plant, that speak from within this place of reciprocity.

Figure 1 Map of the Labrador Inuit Settlement Area (LISA)

Used with kind permission of Torngat Wildlife, Plants and Fisheries Secretariat.

1.2 Contributions of the work

There are scholarly and practical reasons for learning more about people-plant relationships in Makkovik. A failure to understand the extent and complexity of people-plant relationships historically played a significant role in dispossessing Indigenous peoples of their lands and harvesting areas (Deur and Turner 2005). Though the Labrador Inuit Land Claims Area recently celebrated its tenth anniversary, there are still two ongoing land claims in Labrador (Innu Nation, and NunatuKavut Community Council). Even modern land claims processes can underrepresent the importance of plants to Indigenous peoples: for example, of 116 land use maps in the Labrador Inuit Land Use and Occupancy study (Brice-Bennett 1977), only a single map focuses on areas that are important for plant harvesting. When observers compartmentalise plants as individual things, or consider their importance only in terms of economic or caloric value, it diminishes the cultural importance of plants relative to practices such as hunting, trapping, and fishing – even though these practices all depend on plants. Practically speaking, it conceptually reduces the spatial scale at which plant practices occur, and obscures an important way that people relate to broader landscapes. Recognising the importance of plants and plant knowledge can make land use planning processes more comprehensive, and more reflective of the diverse ways in which plants are valued for their own sake, as well as for the practices they support. Since definitions of well-being in Labrador are multi-dimensional and anchored by an enduring and intimate set of practices and relationships with the land (Hanrahan 2000, Martin 2011), recognising the value of plants can enrich an understanding of wellness and inform cultural and community wellness programs.

Labrador is affectionately called “The Big Land”, but it is not an empty land. Inuit have long said “Our footprints are everywhere” (Brice-Bennett 1977) in recognition that Labrador is not an unpeopled wilderness but a cultural place. Research in historical ecology is only recently beginning to look at the ways in which cultural and biological processes in Labrador are intertwined. For example, work in northern Labrador is demonstrating how wooding (wood harvesting) has historically affected forest boundaries (Lemus-Lauzon et al. 2012, Roy et al. 2012, Roy et al. 2015). There are still many gaps in our ecological understanding of the interrelatedness of cultural and biological processes, and how people-plant relationships in Labrador are expressed in landscape. This limited understanding is problematic for decision-makers in land management and conservation planning, especially in the current regional context of increasing mining and hydroelectric pressures. Without a basic knowledge of the role of cultural practices in structuring plant communities, we have a reduced capacity to effectively protect the processes, both cultural and biological, that contribute to biodiversity in Labrador. We need to understand a very broad range of cultural practices with plants to understand the full extent to which people shape landscape. These practices include plant harvesting—wooding, berrypicking, digging sod, tending feral rhubarbs—and they also include the personal, cultural, and ecological rationales for why plants are transplanted, shared, cared for, and protected. It is just as important to learn how cultural practices affect plant communities as it is to appreciate how plant communities support cultural practices and values, in what is a reciprocal relationship.

To learn about relationships between people and plants, and to understand the connected web in which they operate, requires practice with relational seeing. I believe

Indigenous methodologies, with their insistence on relationality, are particularly appropriate in helping us to see plants not as objects but in the context of relationships: with people, with cultural practices, with animals, with weather, with soils, and with space and time. In research that looks at cultural plant knowledge, I think Indigenous methodologies encourage us to see new possibilities for social relationships; for example, how berries are not just something you pick and eat, but how berries are part of a sharing practice that allows you to fulfil family and community obligations. Indigenous methodologies are similarly helpful for ecologists not least of all in the compatible belief that relationships are the primary foundation for life; they also hold great insight for how human relationships shape ecological questions and bring meaning to research findings.

Indigenous methodologies encourage a new kind of thinking about ourselves in relation to our world. One such alternate perspective is that we are connected to landscape and have a place in it, and that this place need not be ecologically destructive. This research adds to existing voices who articulate the very real and practical need to learn from cultures whose values and practices have helped them live within their ecological means (Anderson 2005, Turner 2009).

Indigenous methodologies teach that we have obligations to fulfil in our relationships, be these with human or plant communities. In understanding that reciprocity is so central in all relationships, it becomes clear that this concept extends to research relationships. This is another reason why I feel that Indigenous methodologies are powerful in the context of this research; namely, because they make it clear that research ultimately depends on the strength of our relationships. Carol Gear is the Community Liaison Officer in Makkovik, and a central advisor and co-author in this

research. She describes research as a garden: “Think of Makkovik as your garden. Your garden is only going to be as nice as you tend it. You’re not just going to enjoy all the beautiful flowers—the Elders—but you’re going to have to be giving back to them” (Carol Gear 2016a). Scholarly learning depends on showing reciprocity in building and maintaining strong relationships. Some of this reciprocity has been at larger community-level scales, such as structuring research objectives around community priorities. Some of this reciprocity has been at small and individual scales. As Makkovimiut plant mentor Aunt Nellie Winters says, “Give what you can give” (Aunt Nellie Winters 2014a).

It’s customary in a doctoral dissertation to write about the significance of the student’s research, its novelty, and its broader academic meaning. From an academic perspective, a central contribution of this work is the attempt to understand the ways in which northern landscapes are cultural. To this end, and towards including the North in broader conversations about the role of people in crafting landscape, this research builds on a growing body of work that looks at people-plant relationships in the North. In Labrador, this body of work includes research on Inuit ethnobotany and ethnoecology (Karst 2002, Clarke 2012, Cuerrier et al. 2012, Cuerrier and Hermanutz 2012), and it also includes research in historical ecology that demonstrates relationships between cultural practices and biological communities (Lemus-Lauzon et al. 2012, Roy et al. 2012, Roy et al. 2015). Relatedly, this research contributes to our understanding of the effects of northern built environments on plant communities (Forbes 1996), and to our understanding of the “urban ecology of the North” (credit to Dr. Jeremy Lundholm for this terminology). I have described some of the ways in which I think this research could make contributions to land use planning, programs that focus on well-being, and

conservation planning. Like much research in ethnobiology, this research attempts to communicate some small part of the wisdom of Indigenous communities regarding how we might think and live differently in the world. It also joins a growing body of self-reflexive work written by non-Indigenous researchers on the process of working with Indigenous communities (Nakamura 2010, Getty 2010, 2010, Castleden et al. 2012, Heikkilä and Fondahl 2012). Finally, in working to understand both the stories people tell about plants, and the stories plants tell about people, this research creates a place for Indigenous and ecological methodologies to work together. An interdisciplinary approach helps weaves together the narratives of both people and plants, so that these narratives may inform and enrich each other, and tell a story that is greater than the sum of its parts.

Although there are novel elements in this work, novelty alone is not a particularly strong reason for doing research. Describing the novelty and significance of one's own work is also extremely awkward in Indigenous methodologies, which is a discussion I have included in the conclusion to this dissertation. Many Indigenous scholars assert that research must have meaning and benefit for communities (Crazy Bull 1997, Deloria 1999, Wilson 2001, Louis 2007, Newhouse 2008, Wilson 2008, Kovach 2009, Bull 2010, Healy and Tagak 2014). As I have struggled to articulate the academic reasons for doing this research, I have come to understand that academic reasons have been quite secondary in this learning. When I consider what has truly fuelled this work, I find the answer in Margaret Kovach's writings on patterns of successful research within Indigenous methodologies, in which "personal meaning was bound with community relevancy" (Kovach 2009, 115). In this research, my love for plants found a place in Makkovik, and

found a way to be useful to Makkovimiut. The most honest and important scholarly contribution I can make is in insisting that research is significant when it fulfils both personal meaning and community relevancy.

1.3 Research objectives

In May 2012, I began speaking with research advisors within Nunatsiavut Government and the Makkovik Inuit Community Government to discuss whether there was interest in research on the topic of people-plant relationships. Through three visits to Makkovik in 2012-3, I met with Makkovimiut to better understand research priorities on this topic. These discussions generated a great number of community research priorities (Appendices A-F), including two around which this research is structured:

Priority i. *Documenting cultural plant knowledge in Makkovik:* Many Makkovimiut expressed admiration for the plant knowledge of Elders in the community, and a desire to learn more plant knowledge themselves. Some Makkovimiut expressed concern that parts of a collectively rich body of knowledge were being lost with the passing of Elders in the community. A recurrent research request was the documentation of Makkovimiut plant knowledge.

Priority ii. *Learning more about the plants of family places:* Prior to the 1950s, many Makkovimiut lived seasonally in winter and summer family homes in the areas near Makkovik. Families today continue to fish, trap, hunt, and harvest plants in their traditional family areas, where many family cabins are currently located. Makkovimiut

were interested to know more about the plants particular to their family places.

The primary research objectives for this dissertation come from these two community research priorities. The objectives follow community guidance on what is relevant research, and what is useful research (Kovach 2009). I have worded the objectives to reflect my learning objectives as a student.

Objective 1. *To learn about Makkovimiut relationships with plants*

This objective responds to the Makkovimiut research priority of documenting cultural plant knowledge in Makkovik. It seeks to document to the broadest possible extent the interactions that Makkovimiut have with plants. Moreover, this objective seeks to understand the ways in which plants and plant communities are important to Makkovimiut on personal, family and community levels. It seeks to learn how cultural plant knowledge is actively practiced, and how cultural values shape views on harvesting and respectful behaviour towards plants. This objective also seeks to understand how plant management is practiced in Makkovik, and to understand relationships between plant management, cultural values and ecological values.

Objective 2. *To learn about the effects of cultural practices on plant communities*

This objective responds to the Makkovimiut research priority of learning more about the plants of family places. Family places are the areas around Makkovik where Makkovimiut lived in seasonal summer and winter homes before moving full-time to the community of Makkovik in the 1950s. The details of this objective emerged subsequent

to work on Objective 1, as Makkovimiut plant mentors identified the cultural practices and family places that could tell an ecological story. Specifically, this second objective seeks to understand through research in plant ecology whether plant communities differ in response to different types of fishing stations: large-scale commercial fishing stations, local family fishing places, and mixed use harvesting places.

Objective 3. *To learn how to respectfully approach research on people-plant relationships in Makkovik*

Similarly to the slow and sequential development of Objective 2, this third objective developed in response to working on both of the community research priorities. It developed out of a very basic question: As a visiting researcher, how do I do this work respectfully? Objectives 1 and 2 provided the structure to create tangible research outcomes: names of species, transcripts of stories, findings on the environmental variables that help structure the plant communities of family places. These two objectives support the development of practical community research products, such as a Makkovik plant book, and they support the integration of plant knowledge into programs for youth, community health, and tourism. But before any of these research outcomes could be realised, I needed to better understand what kind of research process would successfully support and sustain these goals, products and programs. This third objective therefore focuses on the research process, on methodology, rather than on research products. This objective seeks to reflect on and articulate how I went about the research process, and to explain how Indigenous methodologies helped guide this work. This objective has been a personal search for how I might be a respectful learner in Makkovik, and what respectful

learning might look like in practice in Makkovik.

1.4 Dissertation structure

This dissertation is structured to reflect the three research objectives. It contains three central chapters, one for each of the objectives. These chapters are intended to eventually be stand-alone journal articles.

Chapter 2. *An Indigenous methodologies approach to understanding people-plant relationships in Makkovik*

Although this methodological chapter reflects the third objective, it is sequentially first in this dissertation. This chapter is a reflection on trying to work according to Indigenous methodologies as a non-Indigenous student. It details the process through which I worked with Makkovimiut plant mentors to document cultural plant knowledge, and also describes the approach I followed to apply methods in plant ecology in a context-specific way. Methodology and methods are what have allowed the shared stories of people and plants to emerge, and yet this methodological chapter is more than the “how-to” prelude to the two other chapters. It is both process-oriented and self-oriented in its attempts to simultaneously detail and evaluate how I went about my work, in learning how to learn from people and from plants. It reflects on the research process, beginning with the personal meaning of this research and understanding community relevancy. It looks at how methods support the relationships upon which research is founded. It considers how we evaluate the methods of others, and how we evaluate what successful research looks like. Because of its centrality to the entire dissertation, this methodology chapter is a

stand-alone chapter that is both descriptive and evaluative.

Chapter 3. *The stories people tell about plants: Makkovimiut plant knowledge in practice*

This chapter looks at the cultural importance of plants to Makkovimiut. Through the example of a single species (blackberry/paunngak/*Empetrum nigrum*/crowberry), it considers the ways that plants are integrated into many aspects of life in Makkovik. This chapter discusses how plants make other cultural practices possible, and the ways in which plants are valued above and beyond unidirectional uses. The section on plant management reviews historical plant management in Labrador, looks at how Makkovimiut care for ecological and cultural values through harvesting practices, and considers how these practices promote cultural values. The chapter closes with Makkovimiut views on the importance of protecting harvesting places and practices, and listening to the voices of plants.

Chapter 4. *The stories plants tell about people: Ecological footprints of fishing places near Makkovik*

This chapter looks at the differential effects of family fishing places and commercial fishing stations on plant communities near Makkovik. It asks whether there are site-level differences in plant communities at family fishing places, commercial fishing places, and mixed harvesting areas. This chapter looks at the effects of the historical built environment on plant communities at these sites, to learn more about the urban ecology of the North. The chapter discusses how plants and soils have ecological voices that tell

the hidden local stories of people. It closes by discussing how ecological research is shaped and understood through cultural knowledge.

1.5 Indigenous methodologies

Indigenous methodologies are central to all parts of the research, not only to the self-contained methodological chapter. They are likewise central to an overall orientation to this dissertation. Instead of placing a review of Indigenous methodologies in the literature review beginning in section 1.6, I am engaging with literature from Indigenous methodologies in this orientation section in order to explain my methodological choice, and to help orient readers to key teachings and principles in Indigenous methodologies (at least my interpretation of them) that are recurrent in this dissertation.

Many non-Indigenous authors conscientiously strive to communicate an accurate account of their work with Indigenous peoples – this dissertation will hopefully be counted amongst these works. It is often impossible to evaluate whether these accounts faithfully or respectfully represent a community’s view (Crazy Bull 1997), or if these written accounts have had community review or approval. Questions around representation—who has the right to speak for whom—are central to Indigenous methodologies as they are to other fields of qualitative research (Kovach 2009). It may be self-evident to write that this account of people-plant relationships in Makkovik is similarly another account of a non-Indigenous visiting researcher. Like other researchers in similar situations, I have reviewed transcripts for accuracy with Makkovimiut plant mentors, worked with Makkovimiut to understand teachings from cultural plant knowledge, developed interpretations of ecological findings collaboratively with

community members, and have reviewed chapters with Makkovimiut plant mentors, advisors, and guides, some of whom are co-authors. Despite these efforts towards collaboration, this dissertation still has only one name on its cover. I understand that I am its author, and that, apart from the direct quotations of others, it is written in my words. I have chosen what to include and what to omit, what to elaborate on and what to skim over. It is an academic requirement that I take ownership of this document. While I recognise this requirement, it remains challenging to consider this “my” dissertation, because it is built with the contributions of many other people and plants. There is more discussion on this tension in the following sections on Indigenous methodologies and in Chapter 2, especially on viewpoints on the nature of knowledge.

It is important that other voices take precedence in particular sections of this dissertation. For perspectives on Indigenous methodologies, as well views on Indigenous relationships with plants, I privilege the works of Indigenous authors who work with these methodologies. I especially thank Community Liaison Officer Carol Gear, guide Todd Broomfield, Makkovik historian Joan Andersen, Makkovik AngajukKâk (Mayor) Herb Jacque, and individually cited Makkovimiut plant mentors for their perspectives on their own community, in both this introduction and in subsequent chapters. In particular, I hope the direct commentary from Makkovimiut will help bring more of the most relevant voices to this dissertation.

1.5.1 Methodology: resonance and choice

In Indigenous worldviews, knowledge rests on relationships (Wilson 2001). How we work, and the kind of reciprocity we practice, determines what kinds of relationships we

build. This dissertation is about relationships on many levels. In terms of content, much space in this dissertation is devoted to the relationships between people and plants, and how these relationships are expressed in human and ecological narratives. On a deeper level, many other relationships sustain this learning about people-plant relationships. It has been necessary to try to work in such a way as to honour and build these relationships.

Indigenous methodologies are, I believe, the most appropriate place from which to build these relationships and engage with this work. That is not to say that other approaches would have been inherently unsuccessful in learning about people-plant relationships. Some Indigenous scholars discuss the links between Indigenous methodologies and other “methodologies from the margins” (Kovach 2005, 24), such as participatory and feminist methodologies (Kovach 2005, 2009), as well as critical theory and constructivist theory (Wilson 2001). It’s not my intent to advance these comparisons in this dissertation. As with perhaps any methodological approach, a methodological choice is more telling of the worldview and experience of the individual than of the singular appropriateness of the methodology (Kovach 2009).

I grew up in Canada in a family with European ancestry, who instilled in me a great love and respect for nature. I came to view the natural sciences as a way to learn more about and ultimately protect the natural world from the mostly damaging actions of humans. I would say that I have always cared very deeply and viscerally for the natural world, but early on internalized that science had little space for demonstrations of personal feeling.

In my undergraduate degree, I experienced for the first time the scepticism with

which personal feeling could be received in the sciences. I had been meeting with a senior faculty member to ask for advice in selecting courses. When I naively described my ideal professional future as a kind of caring scientist that helped people care more about the Earth, the faculty member replied, “It sounds as though you want science without the science.” I felt ashamed of myself. I had been sized up and found to be lacking in rigour. I didn’t say much more during the meeting. I was still completely unaware that there were alternate kinds of relationships that people could share with plants in which plants were more than objects of dispassionate study.

Small glimpses of other relationships with plants presented themselves as I started to work in field botany. An ethnobotany project between the Royal Botanical Gardens in Hamilton and Six Nations of the Grand River permitted me a brief chance to work alongside people who knew plants not just by names, but in a way that seemed more familial. In regional floras like Harold Hinds’ *Flora of New Brunswick*, I read Mi’qmaq and Maliseet names for plants, and as I walked transects along beautiful rivers I felt that surely there must be more to plants than lists. Dr. Jeremy Lundholm, my MSc supervisor, gave me a book by Robin Wall Kimmerer called *Gathering moss: A natural and cultural history of mosses* that confirmed in the most lyrical way that plants are more than names on lists. I would call it a revelatory text for its interwoven accounts of natural science, Indigenous ways of knowing, and personal experience – and, I would add, for its bravery in sharing deeply personal relationships with moss in writing.

Still more years passed before I began to learn through experience that different ways of knowing the world allow you different ways of seeing the world, both literally and figuratively. I learned this lesson through walking outdoors with guides and friends

in their own communities and places. I've spent a lot of time walking outdoors on my own, and I thought I was pretty observant. I remember one walk in particular in northern Quebec when someone physically stopped me to point out the tracks, topography and patterns in the grass that showed where a fox sat to wait for mice. There was an entire story in the landscape written in relationships, and I couldn't read it. I was so fixated on trying to identify the individual species of grass (*Festuca rubra* again?!) that I was missing its relationships with the world. This was someone sharing a relational seeing born of a relational knowing.

Another penny dropped when I had a discussion with Dr. Henry Lickers, Director of the Mohawk Council of Akwesasne Department of the Environment, about disjunct species; in particular, Carolinian tree species that were growing well north of their usual range. Henry's gentle humour was palpable when he said, "People planted those butternuts. They carried them north over thousands of years and tended them. Or did you think squirrels did all the work?" (H. Lickers, pers. communication, 27 June 2011). I began to understand that I was connected to this network, too. Those relationships connecting the grass to the world, the butternut to the world— they included me. Here was a way of being in the world in which ecologically transformative relationships with plants that were neither unidirectional nor destructive. That understanding has to me become a hopeful touchstone and aspiration.

Many aspects of Indigenous methodologies resonate with me: strengthening relationships between people and plants; collective, experiential and place-based learning; behaving respectfully towards the natural world; and work that is meaningful for communities. As an ecologist, the fundamental belief in Indigenous methodologies

that life exists through relationships (Wilson 2001) makes complete sense to me.

Ecology, the study of “oikos: house, household, also dwelling place, family” is the study of relations (Schwarz and Jax 2001, 145). There are certainly differences in how relationships are understood in ecology and in Indigenous methodologies. Researchers in ecology often use reductionist techniques to make sense of complex networks of variables, such as the statistical analyses in Chapter 4, whereas researchers in Indigenous methodologies strive to find meaning in the holism of story, rather than in recombination of its component parts (Kovach 2009). These fields generally hold different views on the consciousness and agency of plants, which drives differences in how researchers perceive obligations in the research relationship. Many ecologists bring their own personal and private environmental ethics to their research, but ethical codes of conduct for ecological societies focus on conventional professional workplace standards (Ecological Society of America 2013) rather than the obligation to actively practice reciprocity in relationships with plants and soils. Despite these differences, there is great promise in combining approaches towards an understanding of people-plant relationships. Indigenous approaches to learning can more deeply inform research design in ecology, and stories can help ecological findings maintain critical context. Striving for reciprocity in ecological research can strengthen research relationships with landscape and with communities for whom a “field site” is home. For these personal and professional reasons, I believe Indigenous methodologies offer unique and appropriate guidance for learning about people-plant relationships.

1.5.2 Relational knowing

There are key tenets in Indigenous methodologies that have steered the development and practice of this research. In Chapter 2, using specific examples, I trace the ways in which these methodological cornerstones have directed all stages of the research process. In this introductory section, I review the writings of Indigenous scholars who discuss the underpinnings of these key tenets in Indigenous methodologies.

To understand why Indigenous methodologies are appropriate for guiding research on people-plant relationships, one first has to consider Indigenous ontologies, axiology, and epistemology. In particular, Shawn Wilson speaks to the fundamental importance of relational knowledge in Indigenous ontologies:

One major difference between the dominant paradigms and an Indigenous paradigm is that the dominant paradigms build on the fundamental belief that knowledge is an individual entity: the researcher is an individual in search of knowledge, knowledge is something that is gained, and therefore knowledge may be owned by an individual. An Indigenous paradigm comes from the fundamental belief that knowledge is relational. Knowledge is shared with all of creation. It is not just interpersonal relationships, not just with the research subjects I may be working with, but it is a relationship with all of creation. It is with the cosmos, it is with the animals, with the plants, with the earth that we share this knowledge, It goes beyond the idea of individual knowledge to the concept of relational knowledge (Wilson 2001, 177).

Knowledge is pre-existing, eternal, and is shared in by the whole cosmos (Wilson 2001, Getty 2010), and “systems of knowledge are built on the relationships that we have” (Wilson 2001, 177). To me, this worldview means that learning—research—emerges from and is sustained by the relationships that we develop, as Wilson says, with each other, with plants, and with ideas. Research is the process by which people deepen their relationship with the cosmos, and in this way it has been described as a process of “fulfilling your relationships with the world around you” (Wilson 2001, 177), as a sacred

and spiritual journey (Louis 2007), and as ceremony (Wilson 2008). Just as knowledge is not individual or proprietary, the benefits that come from research are not strictly personal or individual, because research must also resonate with an Indigenous axiology. This means that researchers are expected to fulfil their obligations in their research relationships, and work with collective knowledge in such ways that research benefits the wider community (Wilson 2001, Louis 2007).

1.5.3 Links with Indigenous epistemology

Shawn Wilson writes about the importance of Indigenous epistemology to practicing Indigenous methodologies: “when we talk about research methodology, we are talking about how you are going to use your ways of thinking (epistemology) to gain more knowledge about your reality” (2001, 175). Margaret Kovach describes methodology as therefore being process-oriented, as putting into practice the ways that Indigenous peoples come to know. She draws on the writings of other Indigenous scholars in describing what is meant by an Indigenous epistemology:

So what is an Indigenous epistemology? Here are some thoughts. It includes a way of knowing that is fluid (Little Bear, 2000) and experiential, derived from teachings transmitted from generation to generation by storytelling; each story is alive with the nuances and wisdom of the storyteller (King, 2003). It emerges from traditional languages emphasizing verbs, not nouns (Cajete, 1999). It involves a knowing within the subconscious that is garnered through dreams and vision (Castellano, 2000). It is a knowledge that is both intuitive and quiet. Indigenous ways of knowing arise from interrelationships with the human world, the spirit, and the inanimate entities of the ecosystem (Battiste and Henderson, 2000). Indigenous ways of knowing encompass the spirit of collectivity, reciprocity, and respect (Wilson, 2001). It is born of the land and locality of the tribe. Indigenous knowledge ought to be purposeful and practical. It is born of the necessity to feed, clothe, and transmit values. As such the method of knowing must be practical and purposeful. Indigenous ways of knowing are organic with emphasis on reciprocity and humour. These ways of knowing are both cerebral and heartfelt. As the elders say, “If you have important things to say, speak from the heart” (Kovach 2005, 27).

From this overview of Indigenous epistemology, Kovach identifies key themes that help explain Indigenous methodologies. One of these themes is relationality, a concept central to the writings of Indigenous scholars in discussing Indigenous methodologies (Cajete 1994, Smith 1999, Meyer 2001, Wilson 2001, Martin 2003, Weber-Pillwax 2003, Absolon and Willett 2004, Kovach 2005, Louis 2007, Wilson 2008, Kovach 2009). A relationship-based model of research is philosophically important in recognising and respecting the value of relationships in Indigenous communities. This model is also practical in demonstrating the sustained level of commitment that is necessary for successfully learning and working with Indigenous communities (Kovach 2005).

A second key theme is what Kovach calls “the collective” (2005, 30). The collective refers to nature of Indigenous economic, political, and cultural systems, the way that knowledge exists, and the understanding that accountability and reciprocity are implicit in daily life (Kovach 2005). The collective holds meaning for researchers in that knowledge is collectively held and that benefits must be collectively shared.

The third key theme is methods (Kovach 2005). Methods in Indigenous methodologies are discussed in more detail in the following sections. In brief, methods in Indigenous methodologies are more than techniques used to generate data. They are processes that are resonant with an Indigenous paradigm and through that resonance build relationships between everyone in the research process (Wilson 2001). Some of these methods may be adapted from methods in social sciences, such as focus groups (Wilson 2001), and other methods may be “alternate ways of knowing” (Kovach 2005, 31) that help carve out new spaces for ways that knowledge is accessed.

1.5.4 Indigenous methodologies: guidance for researchers

Taken together, Indigenous methodologies and the ontology, epistemology, and axiology that anchor them hold lessons for researchers in how they think of and approach their work, at all stages. If researchers are part of an extended web of relationships, accountable to their relations, and responsible for nurturing these relationships (Louis 2007, Wilson 2008), then researchers need to continuously think about their obligations in these relationships, and how they will fulfil them (Wilson 2008).

As they begin to contemplate research ideas, researchers are encouraged to ask, “Why do I seek this knowledge?” and to ensure that the answer is compatible with an Indigenous axiology (Wilson 2001). Indigenous methodologies emphasise that the research agenda needs to originate with the Indigenous community (Louis 2007). This process shows respect for the ideas of others (Steinhauer 2002) and acknowledges the importance of context and place to Indigenous knowledge (Martin 2003, Louis 2007). Research topics and questions must reflect community needs, respond to Indigenous goals and protocols, and be collaborative (Louis 2007).

Researchers must reflect on whether all aspects of their methodologies work towards building and honouring relationships. Having initially asked, “What are my obligations in this relationship?” (Wilson 2001, 177) researchers must further ask, “Do my methods help me fulfil these obligations?” Conventionally, methods are the tools a researcher uses to gather data; in Indigenous research methodologies, methods are also tools that help researchers build relationships and fulfil obligations of relational accountability (Wilson 2001). The utility and appropriateness of a researcher’s methods should be gauged not only in relation to validity and reliability (Wilson 2001), but

according to expanded criteria that measure how effectively and respectfully methods build relationships.

Indigenous research methodologies insist upon “respectful representation”: a thoughtful, humble and respectful consideration of how the researcher hears, understands, and ultimately represents shared knowledge, the research, and herself (Steinhauer 2002, Louis 2007). Respectful representation applies to the application of methods, insofar as the researcher represents herself, and understands the ideas and perspectives of research partners, but this also applies to analysis, reporting and communication. Relational skills are valued in Indigenous methodologies, where successful researchers will be those persons who have “humility, a sense of humour, and are attuned” as a result of maintaining long-term relationships with Indigenous communities (Kovach 2010, 65).

Relational skills are also required in accessing other kinds of learning, such as learning by attending (Bawaka Country et al. 2015): listening deeply to landscape, and being open to knowledge and insight that comes from sitting, walking, watching, hearing. Attending requires that researchers “open themselves up to the reality of their connections with the world, and consider what it means to live as part of the world, rather than distinct from it” (Bawaka Country et al. 2015). Just as intuition develops over long-term research relationships with human communities, learning by attending to plant communities and landscape requires time.

1.5.5 Sources of knowledge

The nature and purpose of knowledge—that it is collective and meant for collective benefit—are fundamentally different in Indigenous epistemologies than in scientific ones.

The same is true of accepted sources of knowledge. Indigenous scholars refer to many other conduits for knowledge and learning that would equally be considered methods in Indigenous methodologies (Louis 2007). For example, knowledge comes through dreams, signs, solitude, ceremony, walks in nature, and prayer (Maggo 1999, Salmón 2000, Steinhauer 2002, Kovach 2005, Wilson 2008, Kovach 2009). These sources of knowledge are at odds with the empirical modes of inquiry accepted in western science and in academia more generally. Indigenous scholars discuss the many challenges of negotiating Indigenous ways of knowing with scientific ones, as a part of the tension that exists in negotiating relationships with both their academic peers and their own Indigenous communities (Meyer 2001, Wilson 2008, Kovach 2009). Some scholars discuss the qualified welcome that universities extend towards Indigenous scholarship, owing in part to different perceptions on the nature of knowledge and the legitimacy of the methods used to access it: “if, as the academy claims, it is interested in Indigenous ways of knowing, what it means “to know” must be reconsidered” (Kovach 2010, 60).

The question subsequently arises as to who can come to know through Indigenous methodologies. There is discussion as to whether non-Indigenous researchers can work within an Indigenous framework at all (Steinhauer 2002, Louis 2007, Wilson 2008). The relationality at the heart of Indigenous epistemologies (Wilson 2008) is not necessarily present in non-Indigenous worldviews. There is debate as to whether concepts central to Indigenous axiology—that researchers have a moral obligation to be accountable to all their relations (Louis 2007)—are as inextricably woven into the moral or ethical systems of non-Indigenous researchers (Wilson 2008). Indigenous scholars work not simply within a generic Indigenous research framework, but from their understanding of their

own particular tribal epistemology (Kovach 2009). Ways of accessing knowledge that emerge from specific cultural customs and practices may be closed to non-Indigenous researchers.

As a non-Indigenous student, I approach learning through many different personal filters, but none of these have origins in Indigenous worldviews or a tribal epistemology. An Indigenous experience does not inform who I am today, how I think, feel, and view the world. As a result, I believe it is inappropriate to suggest that I can “use” an Indigenous research paradigm (Bennett 2012) like any other research framework or tool. I do, however, believe Indigenous methodologies have transformative teachings for non-Indigenous researchers concerning the importance of humility, relationality, reciprocity and collective knowledge. In genuinely working to understand Indigenous methodologies, non-Indigenous researchers may develop skills and insights that help ensure “research agendas are more sympathetic, respectful, and ethical” (Louis 2007, 134). So I will qualify my relationship with Indigenous methodologies by saying that I strive to learn from and work according to Indigenous methodologies. It is my hope that by being more aware of the importance of relationality and relational accountability I can more sensitively and appropriately approach research relationships and the research process.

1.6 Relevant literature and research context

Relationships between people and landscape

When the “The Nature of Things” aired a four-part television series on the Indigenous-shaped landscapes of Canada (CBC 2015), it seemed a watershed moment for

reimagining wilderness. Researchers whose works were profiled in the series have laboured for decades to bring this understanding—that natural areas are intensely and expressly cultural—to the attention of the public. Formative writings on the cultural origins of landscapes had already been available for decades. William Denevan’s work in the 1960s on Amazonian forests shed light on the intensely worked soils that underlay this seemingly pristine region (Denevan 1966). William Cronon’s “Changes in the Land: Indians, Colonists and the Ecology of New England” (1983) was one of the first texts to demonstrate that the seemingly untouched forests of northeastern North America, with their open understory and park-like spacing of trees that had so impressed colonists, were the handiwork of hundreds of generations of Indigenous peoples shaping the land to their needs. Equatorial forests in Africa (Bailey 1996), Australian landscapes (Hynes and Chase 1982), forests of Mesoamerica (Balée 1989), and meadows in California (Anderson and Nabhan 1991) – all these landscapes were all shown to have anthropogenic origins. In Europe, plant ecologists showed that legacies of Roman land use were still detectable in the soil nutrient availability and plant diversity of forests (Dupouey et al. 2002).

These scholars helped open the door to conversations about the concept of wilderness, in fact began to chip away at the idea of wilderness that many non-Indigenous Canadians had grown up with: that wilderness was a pristine place outside of human influence, shaped only by ecological processes, in need of protection from human activities, and best preserved by leaving it entirely alone. But if an alternate narrative were true, if no place on Earth was untouched by the deep historical actions of humans (Crumley 1994), then wilderness needed to be reconsidered as a very human place.

In the modern context, we still popularly consider the effects of people on wilderness to be negative: habitat loss, invasive species and anthropogenic climate change (Mackey 2008) are all impacts wrought by “*Homo devastans*” (Balée 1996). But there are alternate perspectives on the nature of human relationships with landscape. Scholars from diverse fields have described a broad spectrum of effects of Indigenous interactions with plant communities. In some cases it is argued that certain Indigenous peoples have had predominantly negative effects on plant communities (Diamond 2005). There are also views to the contrary, that Indigenous peoples are careful environmental stewards and have positive effects on plant diversity (Balée 1993, Toledo et al. 2003, Balée 2006, Campbell et al. 2008, Ford 2008, Ford and Nigh 2009, Martínez-Ballesté et al. 2009). Value-neutral positions are also evident (Abrams and Nowacki 2008, Black et al. 2006), as are conclusions that relationships cause no net loss of biodiversity (Ross 2011). The authors of these works qualify their positions on a case-by-case basis, appealing to the inherent diversity of Indigenous relationships with landscape (Denevan 1992, Stahl 1996, Barlow et al. 2012), as well as the biophysical characteristics of specific landscapes (Diamond 2005).

Despite the abundance of research describing the cultural origins of wilderness, and the diversity of relationships with plants that produce correspondingly diverse outcomes vis-à-vis plant communities, it sometimes feels as though this understanding is slow to inform the national discussion. “Pristine wilderness” is still a common descriptor in the language applied to Canadian landscapes by media (Toronto Star 2015) and government (Parks Canada 2015). Texts in ecology describe the effects of past and present-day humans on habitat loss and extinction rates, but do not discuss Indigenous peoples and

the effects of their historical and contemporary effects on landscape (May and McLean 2007). Texts that advocate for broadening the scope of ecology to include Indigenous knowledge overlook the ecological effects of that knowledge in practice (Sagarin and Pauchard 2012). What we are finally learning about the cultural origins of landscapes is butting up against what, for many of us, is a long legacy of western thought and scientific belief about the inherent isolation of humans from nature, and the necessity of a hands-off approach to wilderness for wilderness' own sake (Botkin 1990).

1.6.1 Indigenous ways of knowing about plants

It may therefore be very hard for individuals raised in a western scientific worldview to internalise what many Indigenous cultures know implicitly: that humans are not and have never been separate from nature. Rarámuri scholar Enrique Salmón writes, “Indigenous people view both themselves and nature as part of an extended ecological family that shares ancestry and origins...The kin, or relatives, include all the natural elements of an ecosystem” (2000, 1327).

1.6.1.1 Plants as kin

In some Indigenous traditions, humans are junior members of a kinship network in which their kin, including plants, have consciousness and knowledge equal to or above their own (Deloria 1999, Tinker 2004). Some cultures see humans as originating directly from plants themselves (see examples in Salmón 2000, Kimmerer 2003), or view plants as spiritual ancestors that have been transformed (Clarke 2007). The shared kinship of plants and animals is reflected in Indigenous taxonomic systems (Dritsas 1986).

Indigenous relationships with plants are not just relationships, in the sense of interactions, familiarity, or knowledge of each other: people and plants are *relations*, kin.

Framing the relationships as solely between “people and plants” is insufficient. People and plants exist in a “sea of relationships” (Cajete 2000, 178). Many Indigenous authors address the concept of the relatedness of all life (Salmón 2000, Wilson 2001, Steinhauer 2002, Kimmerer 2003, Martin 2003, Wilson 2003, Atleo 2005, Louis 2007, Sheehan 2011). The expression “all my relations” is sometimes used to acknowledge and honour this extended kinship network (Absolon and Willett 2004). Silko (1996) explains that humans could not come into being before they recognised the importance of these kinship systems to their survival (in Salmón 2000). It is the very recognition of other beings as kin that makes life possible:

Indigenous people are affected by and, in turn, affect the life around them. The interactions that result from this "kincentric ecology" enhance and preserve the ecosystem. Interactions are the commerce of ecosystem functioning. Without human recognition of their role in the complexities of life in a place, the life suffers and loses its sustainability (Salmón 2000, 1327).

Relationships are described as the foundation upon which life operates. Wilson describes this by simply saying, “[Relationships] *are* reality” (2008, 7) (*italics in original*). Human beings do not simply exist in a sea of relationships: they have a responsibility for maintaining and strengthening these relationships, and are accountable to all their relations (Salmón 2000, Turner et al. 2000, Wilson 2001, Tinker 2004). Part of this accountability is behaving appropriately in fulfilling one’s role in relation to other beings. For example, Tinker (2004) writes that buffalo will make themselves a gift to people, so long as humans do certain things to honour them and show reciprocity (115). Likewise, plants “want to be used,” and are honoured through proper care (Blackburn and Anderson

1993, 155). Through use, humans help plants fulfil their destiny and ensure that plants are abundant (Blackburn and Anderson 1993, Salmón 2000). Humans have a responsibility to care for and increase the fertility of the land (Salmón 2000, Tinker 2004); if they do not care for plants, then plants will disappear (Anderson and Nabhan 1991, Blackburn and Anderson 1993, Parlee et al. 2005, Clarke 2007). If plants are misused, this failure of reciprocity reverberates through an interconnected system, and humans suffer repercussions (Turner and Clifton 2009, Sheehan 2011).

The understanding that plants flourish when tended and harvested has ecological resonance. For example, digging for tuberous plants aerates the soil, and it also severs bulblets from parent plants and increases bud development, thereby increasing reproductive success (Anderson and Nabhan 1991, Blackburn and Anderson 1993, Beckwith 2004, Deur and Turner 2005, Clarke 2007). Similarly, pruning and burning encourages the productivity and quality of plants used in basketry (Blackburn and Anderson 1993, Anderson 2005, Turner 2007). Rare and disjunct plants may be a function of lack of human tending rather than overharvest, which raises questions as to how cultural change and biological change are interrelated. Blackburn and Anderson write that “Indigenous systems of resource management that effectively controlled our public lands five centuries ago are now as rare and priceless a resource as the plants, animals, and rocks that these systems of knowledge were designed to protect and enhance” (1993, 174).

1.6.1.2 Plants as teachers

Plants are never simply passive inanimate objects to be used by humans. Unlike

treatments in ecological or social science literature, Indigenous perspectives do not categorise plants as “mere food” (Hill-Trout, quoted in Maud 1978, as cited in Turner et al. 2000). Like humans and all other beings [including rocks (Tinker 2004) and fire (Miller and Davidson-Hunt 2010)], plants have consciousness and spirit (Gardner 2000, Kimmerer 2003, Tinker 2004, Clarke 2007), and once shared a common language with humans and all other beings (Kimmerer 2003). Plants have their own knowledge and communicate this knowledge to human beings in dreams and visions (Kimmerer 2003, Tinker 2004, Davidson-Hunt et al. 2005, Berkes and Davidson-Hunt 2006). The origin of knowledge is as likely to be spiritual as physical or empirical (Maggo 1999, Salmón 2000, Steinhauer 2002, Wilson 2008, Hoffman 2010), and is as important as other sources of knowledge (Louis 2007). From Indigenous perspectives, a central tenet is that knowledge is held in common by this community of relationships, and is revealed rather than extracted (Wilson 2001, Davidson-Hunt et al. 2005, Wilson 2008).

1.6.1.3 Living relationships

Relationships with plants are not simply historic: they are alive and practiced, despite significant challenges to these practices (Turner and Clifton 2009; Turner and Turner 2008). The “living mutualism” as described by Sheehan (2011, 69) is maintained and strengthened by continued participation in these relationships (Salmón 2000, Wilson 2008). Relationships with plants are both culturally-mediated and intensely personal, narrated through the first person and developed through experience (Davidson-Hunt and Berkes 2003, Turner and Clifton 2009): there is no singular or representative relationship between Indigenous peoples and plants.

1.6.2 Ecological ways of knowing about plants

The importance of understanding the contemporary ecological effects of historical human practices on landscape was only rather belatedly acknowledged as a research priority by ecologists (Foster et al. 2003). Ecological methods often measure the detectable ecological effects of past relationships with plants on present-day plant populations and landscapes. Ecological research relies heavily on a wide diversity of research from the natural and social sciences to put these detectable effects in context, and to make inferences about the less tangible aspects of people-plant relationships, since expressions of cultural relationships with plants (e.g. gathering systems) are poorly represented in the physical historical record (Wilson et al. 1988, Deur 2000). Many papers in ecology are review papers that synthesise knowledge from diverse fields towards a reconstruction of historical landscapes and the relationships that shaped them (e.g. Balée 1989, 1993, Black et al. 2006, Abrams and Nowacki 2008). Modes of inquiry into these past relationships can be strongly historical and are often associated with historical ecology (Balée 1998, Crumley 2003, Balée 2006).

1.6.2.1 Ecological footprints of people-plant relationships

In the Americas, as estimates of pre-Columbian populations have grown (Denevan 1992), so too has the realisation that highly peopled landscapes leave ecological signatures (Denevan 1992, Heckenberger et al. 2007). The effects of cultural processes on landscapes can be both widespread and remarkably enduring (Balée 1989, 1993, Foster et al. 2003, Heckenberger et al. 2003, Dambrine et al. 2007, Abrams and Nowacki 2008, Heckenberger et al. 2008, Munoz and Gajewski 2010, Ross 2011, Ross and Rangel

2011). Some of the best known examples of the legacies of Indigenous ecological engineering are the cultural forests of Mesoamerica (Campbell et al. 2008, Ford 2008, Ford and Nigh 2009, Ross 2011, Ross and Rangel 2011) and the Amazon (Balée 1989, Balée 1993, Heckenberger et al. 2003, Balée 2006, Heckenberger et al. 2007), as well as the cultural meadows of the Pacific west coast (Beckwith 2004, Deur 2000, Deur 2002, Deur and Turner 2005, Turner and Turner 2008); there are many other examples (see Fowler and Lepofsky 2011). In each of these cases, the structure of contemporary plant communities speaks to the lasting ecological effects of people managing—selecting for and selecting against—plant species of value to them.

Other effects of people-plant relationships explored in historical ecology and biogeography include changes to soils, wetlands, and forest development from irrigation and earthworks engineering (Heckenberger et al. 2003, Mayle et al. 2007, Heckenberger et al. 2008), and the strategic use of fire to select for particular plant species and habitat types (Patterson and Sassamann 1988, Blackburn and Anderson 1993, Weber and Flannigan 1997, Anderson 2005, Black et al. 2006, Abrams and Nowacki 2008).

Ecologists also note the effects of Indigenous trading and transplanting on the phytogeography and genetics of culturally important plant species, visible in the present day through extended geographic ranges, increased abundance and frequency of valued species at cultural sites, and genetic variability in managed versus wild populations (Gilmore 1931, Gorham 1943, Rousseau 1966, Minnis and Plog 1976, Wilson et al. 1988, Blackburn and Anderson 1993, Turner and Loewen 1998, Nabhan 2000, Huisinga 2001, Black et al. 2006, Parker et al. 2010).

In the present day plant record, ecologists observe direct and indirect effects of

Indigenous relationships with plants. Authors discuss the nuanced ecological knowledge required to optimise the productivity of pasture, meadow and forest habitats for particular plant species (Lepofsky 1999, Deur and Turner 2005, Black et al. 2006, Mayle et al. 2007, Campbell et al. 2008, Ford 2008, Ford and Nigh 2009, Fowler and Lepofsky 2011, Ross and Rangel 2011). In other instances, ecologists observe the indirect effects of people-plant relationships on plant community composition, such as nitrogen-rich plant communities adjacent to Thule settlements (Forbes 1996) and orchard fallows unintentionally created by dooryard gardening (Balée 1993). Authors acknowledge that people-plant relationships can both intentionally and unintentionally affect plant communities (Gilmore 1931, Mark and Lonsdale 2001, Abrams and Nowacki 2008).

Increasingly, research initiatives looking at people-plant relationships involve collaborations among natural and social scientists, and employ methods from both these traditions “to communicate across disciplinary, cultural, and temporal boundaries” (Wolverton et al. 2011, 116; also see Lepofsky et al. 2003, Nabhan 2009, Fowler and Lepofsky 2011). Review papers looking at historical people-plant relationships are especially reliant on multiple lines of evidence from both natural and social sciences (e.g. Abrams and Nowacki 2008), though making these multiple lines of evidence mutually intelligible and mutually reinforcing remains challenging (Lepofsky et al. 2003).

1.6.2.2 Finding meaning in past people-plant relationships

Understanding past human-environment relationships is said to hold philosophical and practical meaning for present-day relationships, especially for biodiversity conservation (Stahl 2011). In considering the role of Indigenous peoples in shaping landscapes, the

authors of these papers often encourage reflection on the assumptions that guide conservation, management and restoration baselines, and highlighting that land use planning must consider the impact of cultural as well as biological drivers of landscape (Anderson and Nabhan 1991, Gomez-Pompa and Kaus 1992, Foster et al. 2003, Mayle et al. 2007, Ross 2011). They also look to the past for models of sustainable people-landscape interactions that might inform contemporary people-landscape relationships.

One of the most important characterisations of the relationships between Indigenous peoples and plants is that these relationships are confined to a finite, historical period. In many cases, these relationships are not characterised as persisting to the current day. In instances where the modern affiliates of ancient peoples may be unclear, such as in Europe (Dambrine et al. 2007), purely historical methods may be more understandable. Authors suggest that archaeological or palaeoecological studies may sometimes be the only ways to study past management, especially when Indigenous knowledge has been lost (Fowler and Lepofsky 2011).

However, the Indigenous peoples of the Americas, whose past relationships with plants are the focus of much work in historical ecology, are (by and large) contemporary peoples. And while some research explicitly acknowledges and is guided by the adaptive continuity of Indigenous knowledge systems and practices (Karst 2002, Toledo et al. 2003, Ford 2008, Ford and Nigh 2009, Martínez-Ballesté et al. 2009), other research is more opaque when it comes to understanding if and how researchers worked with contemporary Indigenous communities to better understand Indigenous relationships with plants (Black et al. 2006, Mayle et al. 2007, Campbell et al. 2008, Tomimatsu et al. 2009, Ross 2011). This is not to say that Indigenous peoples were excluded from this research;

rather, there is no information in the publications to evaluate if or how Indigenous peoples were partners in the research.

1.6.3 Perspectives on people-plant relationships in geography and ethnobiology

Relationships between people, landscape and plants are prominent in the writings of geographers. Wright (1947) discusses the layers of personal meaning that create individualised interpretations of identical spaces. Yi-Fu Tuan (1977) describes the powerful role of personal sensory experiences over time in constructing our own sense of place. His ideas speak to the importance of taking a broad view of people-plant relationships in research, so as to include the memories, aesthetic values, and sensory experiences that make place-based relationships so personally meaningful at the level of individuals. In regions where people have become emotionally alienated from local landscapes and flora, Ryan (2010) proposes using experiential relationships with plants to help foster a “corporeal aesthetics of plants” (543) and re-engage people with their own geographies of place through an appreciation of Indigenous flora. Conventional dichotomies between nature and society are increasingly being challenged by authors such as Whatmore (2002), who has looked to the relational approaches of hybrid geographies to envision a shared space at the intersection of human and non-human actors. Most of these hybrid geographies relate to animals, which has prompted some authors to call for more attention to plants in theoretical approaches in geography (Hitchings and Jones 2004). Head and Atchison (2009) review emerging “human-plant geographies” (236) with attention to human-plant relationships expressed in food, in gardens, and the role of plants in identity, and call for more thinking on how plants might

have a greater voice in our shared story.

There is an enormous volume of work on relationships between Indigenous people and plants in ethnobiology (Ford 2011), and it is as diverse as it is extensive. Early works looking at relationships between Indigenous peoples and plants take a largely utilitarian approach: e.g., how are these plants used, and could these uses benefit Europeans? (Dickenson 2008, Ford 2011). Ethnobiologists such as Castetter (1944) appealed for a more comprehensive and less utilitarian approach to people-plant relationships, and the field has spread in numerous directions, including linguistics, cognition, taxonomy, archaeology, nutrition and foodways, and ethnoecology (Hunn 2007).

Recent works in ethnoecology take a broader approach to the role of plants in Indigenous culture. These place people-plant relationships within the context of belief systems and practices, and focus on non-utilitarian reasons for valuing plants (Anderson and Nabhan 1991, Davidson-Hunt and Berkes 2003, Barrera-Bassols and Toledo 2005, Davidson-Hunt et al. 2005, Berkes and Davidson-Hunt 2006, Huff 2006, Turner et al. 2009, Miller and Davidson-Hunt 2010). Other authors focus on complex systems of plant management by Indigenous peoples (Anderson and Nabhan 1991, Blackburn and Anderson 1993, Anderson 2005, Deur and Turner 2005, Turner et al. 2009). Many other works address particular utilitarian aspects of Indigenous relationships with plants: for example, as sources of food and medicine (Yanovsky 1936, Arnason et al. 1981, Turner 1981, Brand-Miller and Holt 1996, Bussmann 2006, Fediuk et al. 2002, Black et al. 2008, Lipski 2010, Uprety et al. 2012).

1.6.3.1 Assessing past and present relationships

As in ecological work, it is challenging to assess the role of Indigenous peoples in ethnobiological research that looks at Indigenous relationships with plants. Beyond citing academic ethics protocols, the methods sections of many articles do not mention the degree of collaboration with Indigenous communities, or whether resulting publications were read and approved by community members or advisors (e.g. Ager and Ager 1980, Arnason et al 1981, Mackey and Orr 1987, Motley 1994, Brand-Miller and Holt 1998, Hall 2000, MacDougall 2003, Lipski 2010, Uprety et al. 2012). Accounts by individual Indigenous authors about plants are scarcer, although there is an increasing number of works that express the personally meaningful nature of these relationships (Kimmerer 2003, Turner and Clifton 2009, Ziegler et al. 2009, Kimmerer 2013). Although many researchers focus on the continuity of relationships between Indigenous peoples and plants, there can still be a tendency to summarise past relationships from ethnographic literature without discussing these relationships in a contemporary context and using the present tense, especially in review papers (Brand-Miller and Holt 1998, Hall 2000, MacDougall 2003).

Authors sometimes express concern over the decline of traditional plant knowledge in present day communities (Ager and Ager 1981, Bussmann 2006, Uprety et al. 2012). While there is no doubt that many Indigenous relationships with plants have undergone tremendous changes (Turner and Turner 2008), altered practices do not necessarily reflect deteriorating local or traditional knowledge; there is an important distinction between knowledge loss and knowledge adaptation (Menzies and Butler 2006). Traditional/non-traditional dichotomies for knowledge also raise concerns about how these categories can

be used to traditionalise, assimilate or silence Indigenous peoples (Wilson 2008).

1.6.4 People and plants in northern regions

Plants are often held to be unimportant to northern peoples, and people-plant relationships in the North have received less attention than in other regions (Forsberg 1985, Rautio et al. 2014). Discussions of foodways in northern regions can be biased towards animal foods (Lepofsky et al. 2001). Northern peoples, especially Inuit, are often characterised as subsisting almost entirely on meat and having very few uses for plants (except, in some cases, “berries” generically). Writings by Frank Boas during his visit to Baffin Island are a good example of this perspective: “As the inhospitable country does not produce vegetation to an extent sufficient to sustain life in its human inhabitants, they are forced to depend entirely on animal food” (Boas 1888, 419). A similar conclusion appears to have been drawn by other early observers (Hutton 1912, Giffen 1930, Stefansson 1935, Schaefer 1959, Draper 1977). Plants continue to play a minor role in more recent publications on northern diets (Fediuk et al. 2002, Ross et al. 2006, Hopping et al. 2010, Lipski 2010, Pufall et al. 2011, Jeppesen and Bjerregaard 2012).

The ethnographic record can poorly represent relationships between Indigenous peoples and plants (Beckwith 2004); but, conversely, good ethnographic records of people-plant relationships in the North have also been summarily ignored (Lepofsky et al. 2001). At northern latitudes, observer bias may be responsible for equating low plant diversity with low levels of plant valuation and use (Lepofsky et al. 2001). Dritsas (1986) holds ethnocentric researchers responsible for incorrectly assuming that plants are insignificant to northern peoples, and further suggests that researchers with more

sensitivity to women's roles would better recognise the value of plants to Inuit. Issues of gender are relevant in considering the interests and motivations of researchers who choose to study hunting cultures in the North, as well as the social spheres they have access to (Matthiasson 1992). In all regions, gender bias may influence the status and attention afforded to plant gathering and "women's work" (Norton 1980, Moss 1993, Deur 2002, Howard 2006, Turner 2007). These biases may be especially apparent in early ethnobotanical works, few of which are authored by women (Ford 2011). Other factors associated with undervaluing relationships between Indigenous peoples and plants include low interest by early ethnographers in food plants and plant practices (Norton 1980), lack of botanical and technical knowledge by researchers (Norton 1980), and the dearth of Indigenous accounts of people-plant relationships. This latter gap is highly problematic for many reasons: outside observers of cultural plant practices may not be privy to certain types of cultural knowledge (MacDougall 2003); they may wrongly derive conclusions based on limited observation, incomplete information, and interaction with only certain people in a community (Lepofsky 1999, Deur 2002); and they frequently encounter language barriers (Ager and Ager 1980).

1.6.5 Existing work on Inuit-plant relationships in North America

There are few historical works that look closely or exclusively at Inuit-plant relationships. Authors who do choose to engage with Inuit-plant relationships describe the importance of plants in Inuit culture. Porsild (1953) notes that although quantities of harvested plant foods in the Arctic are small, plants provide critical vitamins in the diet, and storage techniques maximise the nutritive value of harvested plants. McGrath (1977)

reviews plant dyes in the North in the context of experimental dye workshops and crafting in Spence Bay, and comments that new roles for plants in crafting and art quickly became an “economical extension” of traditional plant practices. Ager and Ager (1980) describe plant uses in Alaska in the community of Tununak. They briefly discuss Yupiit plant taxonomy and the effects of cultural change on plant knowledge. Dritsas (1986) focused her master’s thesis on the ethnobotany of Iglulingmiut (in Igloodik/Iglulik, Nunavut), and also discussed taxonomic structure and the role of plants in worldview.

More recently, there has been better recognition of the importance of plants to northern peoples in North America. Burt (2000), Blondeau et al. (2010), and Jones (2010) have all authored field guides to northern plants (in Nunavut, Nunavik, and Northwest Alaska, respectively). Jones (2010) focuses on the nutritional value of Iñupiaq plants, and includes detailed instructions and illustrations on harvesting, storage, preparation, and recipes for plant foods. Blondeau et al. (2010) have written a trilingual field guide (Inuktitut, French and English) that contains a detailed section on Inuit plant uses. Burt (2001) also provides Inuit uses for plants, as well as habitat descriptions for species, and translations are provided in Inuinaktun for paraphrased information on each plant species.

There are a few Inuit-authored works on plants. *Walking with Aalasi* (Ziegler et al. 2009) is a book in Inuktitut and English communicating the plant knowledge of Aalasi Joamie, which she shared with coauthors during walks around Iqaluit Kuunga and Niaqunnguq (Nunavut). Also rich in detail and context is *Interviewing Inuit Elders: Perspectives on traditional health* by Ootoova et al. (2001), in which Inuit Elders describe traditional Inuit plant medicines.

1.6.6 Labrador research context

1.6.6.1 Early botanical collections and writings

The earliest known botanical collection made in Labrador occurred during the Moravian exploration journey in 1765, when Moravian missionary Christian Andreas Schlözer (1738-1769) made collections of plants close to what is now Nain (Pringle 1992, Cayouette 2013). There are several publications that summarise the foremost collectors amongst the Moravian missionaries, discuss taxa of interest to the missionaries, list prominent collecting locations, and trace the use of collections in floras by Pursh (1813), Hooker (1829-1840) and Torrey & Gray (1838-1843) (Pringle 1992, Cayouette and Darbyshire 1994, Cayouette 2013, Cayouette 2014). Many historical botanical collections from Labrador are housed in international herbaria (Cayouette 2013). While the increasing digitalisation of Moravian missionary journals has created new opportunities to query these resources for writings on plants, there remain extensive Moravian collections and correspondences to review for botanical information, and quite possibly for the earliest documented accounts of Labrador Inuit plant knowledge (H. Rollmann, personal communication, 25 May 2015).

1.6.6.2 Labrador plants in natural sciences publications

More recent publications in the natural sciences that include work on the flora of Labrador can be thematically grouped:

Forest management and government research

There is a large body of academic, government and industry literature that mostly focuses on economic interests in the flora of Labrador, or on industrial activities with projected

impacts on plant communities. This literature examines forest ecology from a silvicultural and forest resource management perspective (Wilton 1965, Meades and Roberts 1992, Roberts et al. 2006, Hagemann et al. 2009), and considers the responses of birds and mammals to forest management activities (Simon et al. 2000, Newbury and Simon 2005). The Forest Ecosystem Strategy Plan for District 19, Labrador/Nitassinan (Innu Nation and Department of Forest Resources & Agri-Foods 2003) is a notable exception in the region in identifying cultural objectives for consideration in forest management activities. These objectives include protection of cultural heritage values and landscape aesthetics. Mining and hydroelectric exploration activities have contributed vast numbers of technical reports on vegetation and soils through Environmental Impact Statements (e.g. Nalcor 2009), but the data in these reports are typically restricted to the defined area of project impact. A review the negative effects of hydroelectric projects on riparian vegetation in Labrador is found in Luttermann's doctoral dissertation (2007). Government documents that mention habitat classification or critical habitat include the Department of National Defence Environmental Impact Statement on low-level flying in Labrador (1994), the Recovery Strategy for boreal caribou herds in Labrador (Schmelzer et al. 2004), and three Bird Conservation Region Strategies (Environment Canada 2014). The most recent and comprehensive ecoregion and ecodistrict mapping for Labrador is through the Newfoundland and Labrador Nature Atlas (Nature Conservancy of Canada 2014), which is an ongoing project to compile existing ecological data towards identifying areas of high conservation value throughout Labrador. Its mandate includes the development of new datasets, such as revised Ecological Land Classification, and a Human Footprint assessment to illustrate impacts

of industrial development in the region. The online Atlas includes georeferenced data for rare and special plant species in Labrador, although most records are “limited to communities, roads and areas assessed as part of development proposals” (Nature Conservancy of Canada 2014) and there are no available data for plants near Makkovik.

Climate change, historical ecology, and other plant research

The effects of climate change on vegetation represent another research focus in Labrador. Effects of climate change on vegetation dynamics and berry productivity are documented by Allard and Lemay (2012). Studies in the Mealy Mountains focus on seedling recruitment, tree persistence, and forest expansion in response to recent anthropogenic climate change (Munier et al. 2010, Trant et al. 2011, Wheeler et al. 2011). Other research has looked at paleoenvironments (often through palynology), with a view to understanding the post-glacial revegetation of Labrador and temporal shifts in the forest-tundra boundary in response to climate change (Jordan 1975, Nishimura and Laroque 2011). There is a large body of work focused on establishing links between climate change, vegetation change, and patterns of human migration and cultural change, both over millennia and in the past 500 years, especially with respect to changes in Inuit settlement patterns (Jordan 1975, Fitzhugh 1977, Loring 1992, Hood 1993, Kaplan and Woollett 2000, D’Arrigo et al. 2003, Woollett 2007, Rankin 2009, Woollett 2010, Roy et al. 2012). These studies often combine work in climate and sea ice studies, archaeology, and palynology. Zutter (2009, 2012) has authored the only studies on the archaeobotany of Inuit archaeological sites in Labrador, which draw attention to the importance of berries and shrubs to 18th century Inuit.

Other thematic areas for research on vegetation in Labrador include the fire ecology of Labrador forests (Jordan 1975, Foster 1983, Foster and King 1986), caribou-lichen woodland dynamics (Boudreau and Payette 2004, Theau and Duguay 2004), remote sensing of vegetation in northern Labrador (Fraser et al. 2011), carbon storage (Moroni et al. 2010), and Aboriginal forest management (Wyatt et al. 2009). There are a number of contemporary field guides on the flora of Labrador, most published quite recently:

- Native trees and shrubs of Newfoundland and Labrador (Ryan 1995)
- Wildflowers of Newfoundland and Labrador (Scott and Black 2008)
- Edible plants of Newfoundland and Labrador (Scott 2010)
- Trees and shrubs: Newfoundland and Labrador (Boland 2011)
- Our plants, our land (Cuerrier and Hermanutz 2012)
- Digital flora of Newfoundland and Labrador (2001)

Despite this diverse literature, data on the distribution and abundance of plant species in Labrador remain sparse. Most data continue to be gathered from areas that have undergone environmental assessments, and are also assembled from data mining of herbaria, literature and online databases (C. Hanel, personal communication, 10 July 2012). Recent collecting trips by provincial botanists (summer 2010) extended the known distribution of several species in Labrador by hundreds of kilometres: “Botanically speaking, Labrador is still very much unexplored” (Chaulk 2010, 24). In the Makkovik region, there are no known studies in plant ecology or on historical cultural effects on plant communities.

1.6.6.3 Ethnobotanical research

One of the earliest accounts of any length on Inuit plant knowledge in Labrador is by Hawkes (1916). Of his 235 page report, four pages are devoted to plants. There are

passing mentions of plant use in Turner (1894), Low (1896), and Hutton (1912). The most comprehensive accounts of relationships with plants in Labrador are found in *Them Days Magazine*, which began as a publication of the Labrador Heritage Society in 1973 and is now published quarterly (Them Days Magazine 2015). *Them Days* consists of interviews with Labradorians by Labradorians, and is a priceless archive for regional stories and photos. “Snowblind and seal finger: Stories of early Labrador medicine” (MacDonald 1998) contains interviews on plant medicine, and other issues have detailed building komatiks (sleds) (Winters 1976), turning snowshoes (Davis et al. 1975, Oliver 2000), berrypicking and jam-making (Learning 1975), making birch brooms (Stone 1978), barking nets (Ford et al. 1982), and gardening (Saunders 1982), among many other practices involving plants. Plants feature in the stories told in “Our footprints are everywhere: Inuit land use and occupancy in Labrador” (Brice-Bennett 1977), in which Labrador Inuit detail their relationships with land and sea. In many ways, these interviews and stories are testament to shared experiences with plants that are common to Labradorians throughout the region: for example, the universal importance of berrypicking, and the continuity of this practice to the present day. In other instances, interviews reveal the highly personal and individualised experiences of Labradorians regarding plants, which are expressed in stories about the plants of specific family places, or are revealed in interviews about wood carving or grass sewing.

Only more recently have university researchers begun to work more closely with communities in Labrador in documenting plant knowledge, and in learning about cultural perspectives on plants and habitats. In southern Labrador, Karst (2002) worked with southern Inuit communities (NunatuKavut Community Council) to look at the

ethnoecology and reproductive ecology of bakeapples (*Rubus chamaemorus*) for her undergraduate thesis. In central Labrador, Tracy Inkpen (1999) worked with Innu Nation on knowledge of forest medicines (undergraduate thesis). In Rigolet (Nunatsiavut), research by Luise Hermanutz and Alain Cuerrier is looking at ethnobotanical knowledge and potential nutraceutical potential of *Rhodiola rosea*. In Nain, Hermanutz, Cuerrier and their research team have worked extensively on Inuit ethnoecology (Clarke 2012, Master's thesis) and ethnobotany. Cuerrier and Hermanutz have produced the first guide to the plants of Nain and Torngat Mountains Basecamp and Research Station (Nunatsiavut), a book that includes Inuit plant names and uses (Cuerrier and Hermanutz 2012). They have also published work on the effectiveness of Elder-youth plant workshops in both teaching traditional knowledge and in creating opportunities for communities and researchers to engage with one another (Cuerrier et al. 2012). Downing et al. (2013) produced a Nain community plant booklet from these workshops. There are no available studies that look at cultural plant knowledge in Makkovik, or that take close look at how cultural and ecological values inform plant management practices in Labrador.

1.6.7 The Inuit Community of Makkovik

The Makkovik area has a long human history, which archaeologists date to the retreat of the glaciers 9,000 years ago (Rankin 2013). Subsequently, the region was home to Maritime Archaic, Paleoeskimo, and Thule peoples (Kaplan 2012). Their descendants are today represented in Labrador by Nunatsiavut Government (Inuit), Innu Nation (First Nations), and NunatuKavut Community Council (Southern Inuit).

Nunatsiavut means “Our Beautiful Land” in Inuttitut, the language of the Labrador Inuit (this language is also called Inuktitut, Inuttut and Nunatsiavumiuttut; Torngâsok Cultural Centre 2013). For over thirty years, the Labrador Inuit Association worked to negotiate a land claim and a self-government agreement for Inuit on the north coast of Labrador. The Labrador Inuit Land Claims Agreement (LILCA) came into effect on December 1, 2005, a date that marked the establishment of Nunatsiavut Government and the first self-governing Inuit region in Canada (Nunatsiavut Government 2016). In other regions of Labrador, land claims for Innu Nation and NunatuKavut Community Council are still ongoing.

The Inuit Community of Makkovik (55 degrees 07'N 59 degrees 03'W) is one of five communities in Nunatsiavut. In 2011, Makkovik had a population of 361 people (Statistics Canada 2011). It is one of the more southerly Inuit communities in Canada, surrounded by boreal forest, high rocky barrens and outcrops, and the Labrador Sea (Figure 2).

Makkovik came into being as a permanent settlement in 1860, when a small trading post was built by Mary Ann Thomas (daughter of Mary Thomas, née Broomfield, of Rigolet, and Samuel James Thomas of England) and her husband Torsten Kverna Andersen of Norway, who came to Canada to work for the Hudson’s Bay Company (Andersen 1996). The new post attracted families living in nearby bays, and in 1896 the Moravian Church established their most southerly mission station at Makkovik to minister to the growing settlement (Inuit Community of Makkovik 2013). Many families continued to live in their traditional family areas nearby Makkovik, and visited the town to attend church services, purchase supplies, and sell furs and fish. From October to July,

Figure 2 The Inuit Community of Makkovik - Photos

Photos in descending order: Makkovik shoreline (21 July 2012); Makkovik from the boardwalk (27 June 2014); Makkovik from Makkovik Hill (18 July 2013); Makkovik shoreline during the Annual Heritage Dog Team Race (28 March 2015).

families lived in winter homes at sheltered mainland sites such as Adlavik, Big Bight, Tessialuk, Lanse Ground, Ben's Cove, and Island Harbour. In late June or July, families moved to summer fishing stations at outer bays and islands, such as October Harbour, Ragged Islands, Manaks, Ironbounds, and Turnaviks (the locations of some of these family places are shown in section 4.2.4). Only in the 1950s did families move to Makkovik on a permanent full-time basis. After Newfoundland and Labrador joined Confederation in 1949, it became mandatory for children to attend boarding/residential schools run by the Moravian Church. Families in the areas around Makkovik eventually moved to the town in order to be closer to their children (Herb Jacque 2016). In the 1950s, families from Nutak (1956) and from Hebron (1959) were relocated to Makkovik when these two northern communities had their services removed by the provincial government, the Grenfell Mission, and the Moravian Church (Brice-Bennett 1977; Nunatsiavut Government 2016). These families established five households in the Nutak area of Makkovik, and twenty-six households in what is known as Hebron end in Makkovik (Herb Jacque 2016).

As full-time residents in the town of Makkovik, some Makkovimiut found work at the Cape Makkovik DEW line radar station, or further north in Hopedale at the USAF radar site (J. Anderson, pers. communication 10 February 2016). Makkovimiut also worked as wildlife officers, or worked with Brinex in uranium prospecting in the area (J. Anderson, pers. communication 10 February 2016). Some residents worked locally as carpenters, or at the store (Herb Jacque 2016). Many Makkovimiut continued to work in the codfishery, either as part of family fishing crews or at the Makkovik fish plant which opened in 1972 and originally processed salmon, codfish and char (Herb Jacque 2016).

After the 1992 moratorium on the cod fishery, fishing and fish processing shifted focus to snowcrab and turbot (Greenland halibut), and while the food fishery remains critically important for food, commercial fisheries no longer provides the breadth of employment opportunities they once did.

Ways of life in Makkovik have changed over the years; the fishery is one example. Primary means of transportation have moved from dogteams to snowmobiles, and regular flights by Twin Otter have replaced the DHC-2 Beaver that once landed in the harbour on ice or water. Community infrastructure has expanded with the installation of electricity in the 1960s, the completion of water and sewer lines in 1979, the construction of a community hall, inn, store, government offices, youth centre, and a new indoor arena currently under construction (Herb Jacque 2016). The new J. C. Erhardt Memorial school building opened in 1993 and offers K-12 instruction.

Family harvesting areas today remain relatively unchanged from the years prior to full-time residency in Makkovik (Brice-Bennett 1977). Fishing berths, traplines, and hunting areas are still closely tied to winter and summer family places in the areas around Makkovik, where many families now have their cabins. Wooding (wood harvesting) locations continually shift in response to natural fire events, which produce burned wood that is for many Makkovimiut the preferred wood for home fuelwood (Todd Broomfield 2015a). Over time, these burned woods become cut out, but there are sufficient natural burns to open up new areas for wooding, as well as for harvesting early-successional species like poplar (*Populus tremuloides*) used in carving. Green wood is plentiful around Makkovik, and species burned as fuelwood include spruce (*Picea* spp.), juniper (*Larix laricina*) and fir (*Abies balsamea*). Although there is increased harvesting pressure on

areas immediately surrounding the town, there is no scarcity of fuelwood as is seen in more northern communities in Nunatsiavut (Todd Broomfield 2015a). Makkovimiut preferentially harvest berries close to their traditional family places, most commonly redberries (*Vaccinium vitis-idaea*), blackberries (*Empetrum nigrum*), bakeapples (*Rubus chamaemorus*), blueberries (*Vaccinium caespitosum*), groundharts (*Vaccinium boreale*, *V. angustifolium*), backieberries (*Vaccinium uliginosum*), squashberries (*Viburnum edule*), and also currants (*Ribes glandulosum*). Berry picking areas directly in Makkovik have become scarcer with the increasing size of the town footprint and its new infrastructure (Carol Gear 2014). Wood and berries are harvested for immediate and extended families as needed, and both are extensively shared in Makkovik, especially with Elders or those unable to harvest themselves (Aunt Annie Evans 2014b, Todd Broomfield 2015a). Plants are very rarely sold. Wood is sometimes sold on a small scale basis, and berries are occasionally sold if they are plentiful, but selling plants is an ad hoc activity rather than an employment or income generating strategy (Todd Broomfield 2015a).

Mr. Herb Jacque is AngajukKâk (Mayor) of Makkovik, and he describes Makkovik as a “friendly, family, home community” (Herb Jacque 2016). Makkovik is a welcoming community for visitors, with festivals such as the annual Trout Festival, walking trails like Poet’s Path and the community boardwalks, a new Craft Centre, and many outdoor activities. Makkovik is also a very musical community, with a long history of Moravian church music, brass bands, an annual Jamboree, and recording artists who are well-known in Labrador, such as Gerald Mitchell and Gary Mitchell (Herb Jacque 2016). Many traditions are thriving: sewing skills, making traditional clothing, and drum

dancing are popular with young people (Herb Jacque 2016). Most importantly, AngajukKâk Jacque says he believes “our community stands together and supports each other” (Herb Jacque 2016). Carol Gear (Community Liaison Officer, Nunatsiavut Government, Makkovik) echoes and extends this sense of support to visiting researchers, and says that “researchers experience more community interaction in Makkovik” (Carol Gear 2012) and can thrive in this learning environment.

1.6.8 Academic research in Makkovik

The vast majority of academic studies in the Makkovik area are geological and related to uranium prospecting (e.g. Sinclair et al. 2002, Barr et al. 2007). There are also seabed mapping surveys (Sonnichsen 2008), country food surveys (Mackey and Orr 1987, 1988) and archaeological studies on the Moravian Mission (Cary 2009). The archaeological excavations at nearby Long Tickle through the Central Coast of Labrador Community Archaeology Project produced a remarkable children’s book called Anguti’s Amulet (Central Coast of Labrador Archaeology Project 2005) based on research findings at the excavated site. Ben-Dor (1966) conducted an ethnographic study on Inuit-Settler relations in Makkovik in the years following the Hebron and Nutak relocations, and a follow-up study was done by Kennedy (1982) nearly twenty years later. In partnership with Torngat Wildlife, Plants and Fisheries Secretariat, botanist Claudia Hanel (Department of Environment and Conservation, NL) conducted a plant “bioblitz” in Makkovik in 2010 to record vascular plants, bryophytes and lichens in the region. There are no comprehensive studies in plant ecology, cultural plant knowledge, effects of cultural practices on plant communities, plant management, or any aspect of people-plant

relationship in Makkovik that could be found.

1.7 Conclusion

In her doctoral work, Jonaki Bhattacharyya takes an exploratory, adaptive approach to learning about the cultural-ecological role of free-roaming horses in the Brittany Triangle and Nemiah Valley (2012). Based in part on the work of Babbie (2004), Bhattacharyya explains that an exploratory approach is particularly appropriate in research that seeks an understanding of complex issues, rather than a testing of hypotheses; and for research in which “published research is scarce and local knowledge is rich” (48). An adaptive approach is one in which researchers continuously reflect upon and revise their approaches based on new insights and teachings from others in the research relationship, in both cultural and ecological contexts (Bhattacharyya 2012).

This work takes a similarly exploratory, adaptive approach to learning about people-plant relationships in Makkovik. It is exploratory in its mandate: in asking Makkovimiut about their research priorities on the topic of people-plant relationships; in responding to the priorities of documenting cultural plant knowledge, and learning more about the plants of family places; and in allowing story to illustrate and illuminate Makkovimiut plant knowledge. An exploratory approach is also in keeping with Indigenous views on the nature and goals of learning and scholarship: “If research is about learning, so as to enhance the well-being of the earth’s inhabitants, then story is research” (Kovach 2009, 102). Documentation of the stories people tell about plants, and the stories plants tell about people, is therefore simultaneously a community goal, a research process, and the research product itself. This work is adaptive in responding to

storylines and topics introduced by Makkovimiut plant mentors, and in basing research in plant ecology on the teachings of Makkovimiut plant mentors in order to answer questions that fulfil community research priorities. The subsequent chapters in this dissertation are structured to discuss each research objective—methodologically respectful learning, cultural plant knowledge, and cultural effects on plant communities—one at a time, but together they form the bigger story of people-plant relationships in Makkovik.

2 Chapter: An Indigenous methodologies approach to understanding people-plant relationships in Makkovik

2.1 Introductions

Imagine you are sitting on an island, south of Makkovik [Figure 3]. It's a beautiful sunny day in July. You are sitting on berry bushes, and there are blue, black and red berries as far as the eye can see. They are very soft, warm and fragrant. Seagulls are flying overhead. The water is calm and pristine, but there is a gentle breeze. You can feel the warm sun on your skin, but it's not hot, it's very relaxing. Close your eyes and take a deep breath. Can you smell the berry leaves? I can. Even though I have not touched a plant, I am now calm and relaxed. In order for anyone to understand the importance of plants, wherever in the world they may be, they need to experience the beauty of the whole picture (Carol Gear 2015b).

Figure 3 View of Long Tickle from Malona Point, south of Makkovik, July 2014

Methodologically-speaking, I think it's significant that Carol focuses on experience as the way to develop understanding: "In order for anyone to understand the importance of plants, wherever in the world they may be, they need to experience the beauty of the whole picture" (Carol Gear 2015b). How we come to know affects what we come to know. Since 2012, I have been working with mentors in the Inuit Community of Makkovik (Nunatsiavut, Labrador) to learn about the importance of plants to Makkovimiut (residents of Makkovik). Many Makkovimiut describe the cultural importance of plants through story (Chapter 3), as Carol Gear does in this opening paragraph. Relatedly, I have been trying to hear the ecological stories that plants tell about people, that speak to the importance of people in shaping plant communities and soils (Chapter 4). Together, the shared stories of people and plants are the "whole picture" of this work.

A methodology based in relationality is my way of learning about the relationships that sustain these shared stories. This methodology chapter focuses on my attempts, as a non-Indigenous student, to be guided by Indigenous methodologies in learning about the cultural and ecological relationships between people and plants. It is my reflection on what these Indigenous methodologies have meant philosophically and practically throughout this work.

Before we begin, please allow me to introduce the authors in order to clarify whose voices are speaking in this chapter. The first person singular is me, Erica, a PhD student through Carleton University, living in Goose Bay, Labrador. My words are my own attempt at relating the methodology and methods that produced this collective work. Carol Gear is the Community Liaison Officer for Nunatsiavut Government in the Inuit

Community of Makkovik (Nunatsiavut, Labrador, Canada). Carol is a Makkovimiut advisor for research in her community, and is a local research advisor for this project. At the regional level, Carol is President of AnanauKatiget Tumingit Regional Inuit Women's Association, and President of the OKâlaKatiget Society Board of Directors (the only Inuttitut-English radio station in Labrador). At the community level, she is a member of the Makkovik Tourism Committee, Secretary/Treasurer of the Pantry/Grub Box Committee, a member of the Times of Crisis Committee, and the founder and organizer of the Makkovik Moravian Church Online Auction. Carol speaks in this chapter in her own words through direct quotations. Throughout this work I have also been guided by Dr. Gita Ljubicic, my academic supervisor. Gita's own research projects in northern communities are founded on community-identified research priorities, and predicated on a strong commitment to locally relevant and meaningful research. Her experience has continuously informed this doctoral research. The ongoing expertise and advice of Carol and Gita find expression in our collective work, which is why we are all coauthors on this article.

Just as basic tenets of Indigenous methodologies guided this work at all stages, so will a reflection on these tenets be embedded throughout the chapter. For details and discussions of the cultural importance of plants and Makkovimiut plant management, as well as cultural effects on the plant communities of family fishing places and a more detailed description of ecological methods, please see Chapters 3 and 4.

2.1.1 Self-reflection in Indigenous methodologies – why it's necessary

“Research is ceremony”: this concept is so fundamental to Indigenous methodologies that

it is the title of Shawn Wilson's seminal book on the subject (2008). He explains that as the goal of ceremony is to deepen relationships, so too is the goal of research to deepen relationships (see also Bawaka Country et al. 2015). Indigenous research methodologies are built on a particular axiology, one that is rooted in relational accountability (Wilson 2008). All beings are accountable to their relations, and are responsible for nurturing these relationships (Louis 2007, Wilson 2008). In research, as in all of life, being accountable includes your relationships with "the idea or topic, as well as with the people or mice or trees or whatever you are working with" (Wilson 2001, 178). Researchers, as part of this extended web of relationships, need to ask ourselves some questions about our obligations in these relationships (Wilson 2008), and reflect on whether all aspects of our methodologies work towards building and honouring these relationships.

It is in keeping with my research obligations that this chapter is a reflective one. Indigenous scholars speak about the obligation to reflect on one's self and understand one's motives (Newhouse 2008), and about the significance of "listening and observing the self as well as in relationship to others" (Atkinson 2001). Working with the principles of Indigenous methodologies "requires not only knowledge of content, but also knowledge of one's values, perspectives and attitudes, or at least a willingness to explore them" (Newhouse 2008, 192). This chapter not only outlines the tenets that guided my approach to this research project—my methodology—but also pauses to take stock of how I tried to deepen relationships throughout it.

2.1.2 Respectful representation

A critical obligation in Indigenous methodologies is respectful representation (Louis

2007): to only speak from one's own experience, and not to tell the stories of others as if they were one's own. I wish to be clear that I am a non-Indigenous student and I am not from the Inuit Community of Makkovik. Respectful relationships must be honest ones, and that is why I make my position as a non-Indigenous student clear. I believe it is important to be up-front about these points because I want readers to know that I am unable to speak about research or plants or anything from the perspective of an Indigenous person, and that my understanding of life in Makkovik is from the perspective of a visitor rather than a community member. I only have my own experience with the research process to tell.

We all have our own way of relating to ideas, and our own way of communicating them. Carol once wrote, "My approach to telling people how much plants and our habitat mean to me would differ from Erica's, and I think it is very noticeable. I am not an academic, so my approach would be much more simple. I would prefer to tell you a story" (Carol Gear 2015b). In Indigenous methodologies, the fundamental obligations of personal reflection and respectful representation require that I examine my place in this research, and how I communicate this research. This is difficult, as unlike Carol I would not consider myself a storyteller. Throughout this project, I have thought of myself more as a scribe or listener to the stories of others. Now that it is time to tell a methodological story from my own perspective and through my own words, I have become more aware that, want it or not, I wield an editorial power just by sitting at a desk and typing. Because of this editorial power, it is even more important to reflect on representation.

To be quite honest, the coward in me would prefer not to write about methodology at all, but simply to write about plants. To someone who is shy about committing

personal thoughts to permanent page, personal reflection feels at best like unnecessarily inserting myself into a story, and at worst like unproductive navel gazing (Aveling 2013). However, I appreciate that Indigenous methodologies require more than just a detached story about plants. Margaret Kovach reminds us that, “If it all comes together, the process cannot be separated from the product because they belong together, they complete each other. Making meaning within Indigenous inquiry demands this much” (2009, 129). In the following sections, I reflect on each interconnected step of the research process in the hopes that these reflections might improve our collective efforts to build relationships with Indigenous partners and mentors, and to be more respectful researchers.

2.2 Recognising where questions come from

How do we choose what we work on? An Indigenous methodology includes how we choose our questions. Eber Hampton’s message that “memory comes before knowledge” (1995, 48) asks us to reflect deeply on the motivation for the knowledge we are seeking, and to pinpoint where it originates in our own experiences and memories. Kovach points to a recurring pattern in the successful research of Indigenous scholars: “Among the scholars I interviewed, there was a consistent belief that research should be collectively relevant. In their own research, the personal meaning was bound with community relevancy” (2009, 115). This marriage of meaning and relevancy ensured that work was transparent, honest, strong, and “collectively relevant.” In the context of this project, it was fundamental that I ask myself: i) How do I come to know what is personally meaningful? and ii) How do I learn what is meaningful to the people with whom I work?

2.2.1 Personal meaning – Home is where the plants are

Kovach's discussions with Indigenous scholars reinforce the message that "knowing purpose is wise in any endeavour, and that we find purpose within our personal narrative" (2009, 119). Taking stock of one's personal motivations for doing this work is perhaps the most important first step towards pursuing collectively relevant work. Cora Weber-Pillwax writes that research begins by looking inward: "The source of a research project is the heart/mind of the researcher, and 'checking your heart' is a critical element in the research process. The researcher ensures that there are no negative or selfish motives for doing the research, because that could bring suffering upon everyone in the community" (Weber-Pillwax 2003, 42).

To find personal meaning, we must look at memory, at personal story (Hampton 1995, Kovach 2009). Unlike many of the people I work with, there is no single place that I call home. One of my clearest and saddest childhood memories is the moment my Dad explained that we would have to move from our home in Hudson, Quebec, in order for him to keep his job. Maybe it's more normal than I know, but just as I was anxious to leave my human community, I was also anxious to leave the white pines, the fiddleheads, the cherry tree, the trail through the cedar hedge. What would happen to the places I loved? Would the next people care for them as we had? Since that first move, I have often yearned for a place to return to, where my family is "from" and where we belong. Instead, I have kept moving from region to region, aware that no matter where I am, I am always from somewhere else. It was never a conscious strategy, but I found that becoming familiar with plants in each new place—learning their names, recognising them as I walk outside, spending time with them—made me feel as though I was actually part

of a community. With plants, I had a home in the landscape, wherever I was. Plants made me feel like I had family there and that I belonged. When I return to places I have lived, it is the plants that make me feel home again. If research is ceremony that bridges the sacred space between people and their environment (Wilson 2008), then connecting with plants in the landscape is my way of “fulfilling [my] relationships with the world around [me]” (Wilson 2001, 177). Connecting with plants deepens my feelings for the world as home, and deepens my capacity for empathy, in general.

I thought I could learn more about plants by doing my Masters of Science and studying plant ecology. I did get to know the plants of the coastal barrens of Nova Scotia (Oberndorfer 2006), but often in a unidirectional way that engaged my mind and not directly my heart. If I wanted to learn more completely about plants, I realised I also needed to learn from mentors who actively practice a different kind of relationships with plants (Turner 2005). Furthermore, I believed it was important to base my learning in the place I live, and to learn from landscapes with whom I already had relationships. I had opportunities to do doctoral work in other beautiful places that were unfamiliar to me, and at times could not understand my hesitation to accept these already funded projects. All I can say is that deep down I knew these places would never be home, and I didn’t think my heart would be fully in the work. If the heart directs the research, then a partially engaged heart would be repeating errors I had already made. Labrador is where I live, where my husband’s family is from, and where the plants are familiar. Everything about learning here felt right.

Were these personal motivations so hard to share? Yes, as a matter of fact they were. As students and researchers, we are not often encouraged to explain our personal

motivations for choosing particular research paths. It's common enough to justify research to departments and committees in terms of its academic significance, or to explain to funding agencies why the work is critical and urgently needed, but the framing is often in relation to the pressing needs of other people, especially in the context of problematized Indigenous communities (Smith 1999, Louis 2007). There is little space or encouragement to explain one's personal motivations, even though these personal reasons are thought by many Indigenous scholars to be at the heart of all research (Hampton 1995, Weber-Pillwax 2001, Wilson 2008, Kovach 2009).

It may be a difficult conceptual leap, especially for researchers who come from a natural sciences background, that we have an obligation to share the experiences and feelings that make research personally meaningful. My professional and private relationships with plants have never shared space in academic work, and I am still trying to find my own way to publicly say that the story of plants "cannot be told by data alone" (Kimmerer 2003, 6). In contrast, I don't think it was considered unusual in Makkovik that my love for plants was a central factor in my work. Indeed, I believe that in showing my love for plants I connected with Makkovimiut who felt similarly, and that this connection based on shared passions was deeper and more equal than one based on a problem to be solved.

2.2.2 Community relevancy

Successful research is based on "personal meaning [...] bound with community relevancy" (Kovach 2009, 115). What does community relevancy look like? Many Indigenous scholars contend that knowledge for knowledge's sake is useless, and that

researchers working with Indigenous communities have an obligation to pursue research that has meaning and benefit for the community (Crazy Bull 1997, Deloria 1999, Wilson 2001, Louis 2007, Newhouse 2008, Wilson 2008, Kovach 2009, Bull 2010, Healy and Tagak 2014). Dr. Frank Rowland discusses this belief from a Cheyenne perspective: “Wisdom was learning how to use profound knowledge to help the community. If knowledge was gained but was not used to help the community, it was meaningless” (Crazy Bull 1997, 17). Carol is clear on this point also: “Communities are being surveyed to death – to what end? To help someone get through their school. It’s no benefit to us. [...] It’s important for people’s degrees, but the community never hears anything from it afterwards – that discourages people” (Carol Gear 2013b). Learning is not a selfish, individual or “abstract pursuit,” but rather an act that enriches everyone and helps fulfil one’s obligations in the research relationship (Wilson 2001, 177).

Writings on Indigenous methodologies by Indigenous scholars are important places to start in understanding how respectful research relationships develop in Indigenous communities, and these writings are often the first place a researcher goes before she personally knows anybody to speak with. But community relevancy is rooted in community context and cannot be interpreted from books. Every community has its own unique context, which is why Carol cautions against methodologically pigeon-holing Makkovik, or any other community. She encourages researchers to arrive without a predetermined idea of how people will think, work, behave, or relate to you, or to your research methodology:

Makkovik is an isolated Inuit community. We live in a little bubble, and there are long periods without outside contact. There’s lots going on all the time, lots of issues to deal with every day. When you’re visiting us from outside, it’s a big adventure. But to us, it’s how we live [...] Makkovik is a small community. We

are in tune with each other. We know everyone, we're related to everyone. Everything in Makkovik shuts down for certain things. Everyone is your responsibility, all the kids are your responsibility. It's important not to generalise, not to make assumptions about remote and isolated communities. Every community is different, so don't even stereotype (Carol Gear 2015c).

Carol says a good way to think of a methodology is, "This is my stepping stone, this is where I'm going to start," but cautions researchers about being dogmatic: "Some researchers come in thinking what they know is carved in stone, but it's not always true. If you come in with your mind already made up, you will find a way to prove what you think you already know, and ignore what everyone is actually telling you" (Carol Gear 2015c). There are good reasons to take a more individualised approach to working with people: "People in Makkovik are not always going to see eye-to-eye or have the same opinions. You don't know what's going on behind the scenes. It really depends on who you're approaching in the community" (Carol Gear 2015c).

Carol reflects that community relevancy cannot be separated from personal meaning, which echoes Kovach's insight on these two related touchstones of good research. When research is irrelevant to a community, when it is of no use, "it's not always just because of timelines, funding deadlines, limitations from the university. It's because students are not fully into their work, or because they get interested in something else. When your heart is in it you will do a good job. You will go back just to visit, just to be there" (Carol Gear 2015c).

I would add that it is equally necessary to consider regional relevancy, especially when beginning research planning. In Nunatsiavut, Inuit Research Advisor Carla Pamak is instrumental in ensuring there is compatibility between the interests and needs of Nunatsiavut communities and visiting researchers. Regional guidance was very

important in providing me the overview I needed to work where my research interests could be most useful at the community level.

2.3 Preliminary learning

Community relevancy is context specific. Carol makes it clear that researchers need to get to know individual communities in order to understand what community relevancy means at the local level. Kovach (2009) also emphasises that researchers need to have relationships with a community before they can know what is “useful”, and before they can give back through their research. Preliminary research is a crucial first step in developing these research relationships (Pearce et al. 2009, Laidler and Grimwood 2010, Grimwood et al. 2012) and in ensuring community participation and representation in research (Kovach 2009).

2.3.1 Introductions

Learning how to make your introductions in a community in an appropriate and respectful way requires a local community advisor. As the Community Liaison Officer for Nunatsiavut Government in Makkovik, Carol is a go-between linking Makkovimiut with visitors to her community. One of her many roles is as a kind of cultural interpreter, meaning that she helps non-residents understand Makkovik’s cultural protocols. In essence, she helps people like me learn how to learn in her community. In Carol’s words, research projects “need to reflect the actual situation [...] You need someone who knows the community, who is readily available, and thinks the work you’re doing is worthwhile. They have to share your interests, so they’re passionate, too” (Carol Gear 2015c).

Some of Carol's earliest advice on respectfully introducing myself to Makkovimiut hinged on showing respect for people's time: "People here have so much to do" so researchers need to plan their introductions well in advance of actually visiting (Carol Gear 2012). Additionally,

Researchers need to give a formal introduction at the local level with lots of announcement time prior to visiting. Some people say, "I already have my permit and I'm coming tomorrow." That's not well-planned, and it shows no concern for the community. Their only concern is with their own work, and it has no benefit to the community (Carol Gear 2013b).

Carol suggests that researchers should visit a community as visitors, not researchers, before they commit to working somewhere: "Before you start, just go to the community and familiarise yourself. Just come as a person. Take a week, come in and get to know the place, walk around, go into the store, interact with people. Be a scout. It's like when you choose a location for your cabin – take your bearings. Ask yourself, is this community right for you?" (Carol Gear 2015c).

Introductions in a community must be sensitive to the diversity of people living there:

Different people in town have different answers or actions based on their life, their job, their own context. Don't base opinions on small groups. Much of what a researcher learns about Makkovik will depend on who they speak with – and on what day. You need to talk to and get to know different people. It makes for better research to get different points of view (Carol Gear 2015c).

For example, Carol says, "Contact an Elder, a middle-aged person, and a youth. You'll get different views. You need to talk to a representative section of the community" (Carol Gear 2015c). It was important to speak to many different community members about their research priorities, and to accomplish this Carol advised that I consider the venue

(community hall, in-home visits, town office), meeting time (evening, work day, season), and activity type (round table discussion, individual visit, formal presentation, Elder's dinner, scheduled appointment). This advice proved invaluable throughout all three introductory visits to Makkovik to learn about community research priorities.

2.3.2 Understanding community research priorities

With Carol's guidance, I visited Makkovik on three occasions (July 20-26 2012; Sept 4-7 2012; Feb 18-22 2013) in order to learn more about research priorities involving people-plant relationships. Each time I had the opportunity to meet with Makkovimiut, I asked three questions:

- 1) What are community priorities for research on the topic of people-plant relationships in Makkovik?
- 2) What are useful research products you would like to see for Makkovik?
- 3) What advice do you have for being a respectful researcher in Makkovik?

Most of the discussion time focused on Question 1). Responses broadly fit into the topics of: i) culturally-important wild plants and harvesting; ii) cultivating food plants, and; iii) learning more about the plants of family places and their harvesting/cultivation potential. I kept written notes of all research priorities that were raised, and returned them in a summarised printed visit report to everyone who spoke with me, to the Makkovik Inuit Community Government, and to Carla Pamak, Inuit Research Advisor for Nunatsiavut (Nain) (Appendices A-F).

The priority research areas did not emerge in a single and united community voice (Nakamura 2015); they were an amalgam of priorities shared by individuals. Nevertheless, some priorities were more recurrent than others, or were a first step from

which future work could spring. Foremost amongst these recurring research priorities was documenting cultural plant knowledge in Makkovik, particularly the knowledge of Elders. As Carol says, “We are losing our Elders, and they are the people with knowledge about plants” (Carol Gear 2012). A written record of plant knowledge and plant practices was described as a chance to bring together the community’s diverse individual plant knowledge and expertise into one central community resource. The most frequently recommended research product (Question 2) was the creation of a Makkovimiut plant book that could first and foremost be a resource for all Makkovimiut, and that could also share Makkovimiut plant knowledge with wider audiences. Part of contributing to locally relevant research was assessing what professional skills I could (and could not) bring to these topics. I felt that my experience in field botany could help inform cultural plant documentation, and could also contribute to an understanding of local plant species in and around Makkovik. If my experience had been in agricultural research or contaminants, I would have responded to Makkovimiut research priorities along a different path.

Nearly a year after my first phone call with Carol in May 2012, I formally submitted a research proposal to Nunatsiavut Government and to my department. Its goals were based on the priorities discussed during preliminary research visits: to learn about Makkovimiut relationships with plants; and to learn about the effects of cultural practices on the plant communities of family places. My research proposals were approved by my academic committee (15 April 2013), the Carleton University Research Ethics Board (20 May 2013, Project number 14-0165), and the Nunatsiavut Government Research Advisory Committee (12 July 2013, by letter). Nunatsiavut Land Use Permits

were granted annually (2012, 2013, 2014, 2015) through Lead Conservation Officer Errol Andersen in Makkovik, directly.

2.4 Learners and mentors

It seemed to me that there was a general reticence to answer the third question from my preliminary visits: What advice do you have for being a respectful researcher in Makkovik? When I asked Carol why this question generated so little discussion, she replied that many people are reluctant to appear confrontational or to criticise the behaviour of others: “We only talk to our kids about their behaviour. If someone is making mistakes, we will offer to help, but won’t take over. You don’t tell adults what they should do or can do. Like in a marriage, you don’t tell each other how to behave. You find a non-confrontational way of intervening when the situation needs to change” (Carol Gear 2015c).

Politeness, compassion and care with words are important in conversation (Annahatak 2014). Carol says, “You never know what’s going on in someone’s life. So people hold their tongues – you don’t live their life, you don’t know what they’re going through” (Carol Gear 2015c). Not all visitors to Makkovik are as careful with words. Makkovimiut have had negative experiences with researchers who were not cautious with words, and who were presumptuous about making unverified work publicly available. As a result, too many publications on Makkovik have contained “lies or exaggerations,” or were the product of researchers “thinking they know everything” (Carol Gear 2012; also see Crazy Bull 1997, Smith 1999, Louis 2007). “Most times you don’t even know they’re here until a report comes out [...] and then everything from the study ends up on the

internet and it's all wrong" (Carol Gear 2013b). Mary B. Andersen talks about how experience and knowledge can be misinterpreted by visitors: "It's as if researchers think we're simple, like we don't know anything. It's only that we're not used to having to explain things that are just second nature to us" (Mary B. Andersen 2014).

Being careful with words and recognizing cultural differences also touches on the importance of being humble about one's knowledge. When I was trying to find a word to describe people who were knowledgeable about plants in Makkovik, I started testing the phrase "plant expert" in lieu of informant, participant, collaborator, or knowledge holder. But no one wanted to be called an expert. A tongue-in-cheek working title for the project became "I don't know anything about plants, but..." because it was the single-most repeated disclaimer offered by whomever I was speaking with - one that invariably preceded a conversation about plants that lasted hours. I eventually found "mentor" to be a more resonant term (from Meyer 2001) that helped convey respect for the role of a teacher.

Humility is valued in many Indigenous communities (Smith 1999, Meyer 2001, Lightning 2002, McGrath 2003, Louis 2007, Newhouse 2008, Berkes 2012). This is true in Makkovik, as well: "You don't like tooting your own horn. If you keep saying 'I, I, I' it makes you sound like you're not a team player, like you're doing it for recognition or glory. Nine times out of ten you're not the only one anyhow. It is a team effort" (Carol Gear 2015c). It is important to be careful in speaking only from one's own experience, and not drawing attention to what one knows: it is "better to act from the humble state of knowing nothing" (Lightning 2002, 27). Valuing humility in relation to learning can actually make it hard for a learner to find "experts" to speak with, since many people do

not consider their knowledge remarkable. Janet McGrath writes of the tendency for Southerners to overlook the qualities of respected Elders and professionals on account of the deep humility that informs their communication (McGrath 2003). It was only after repeated requests from researchers to be interviewed that Makkovimiut plant mentor Mary B. Andersen remarked, “They kept asking me to talk so they must have thought I had something important to say” (Mary B Andersen 2014).

In learning, too, it is not appropriate to be conceited about one’s knowledge (Lightning 2002). It is therefore doubly important that researchers go humbly as learners, both to be a humble learner and to pay respect to the humility of teachers. The learner-teacher dynamic is foundational in developing respectful research relationships in Indigenous communities (Archibald 1997). Carol explains, “You’ll reach your goal quicker as a researcher when you come in as a learner, not as an expert. You’re not an expert *here*, you’re here to learn. So act that way! Be more open to what you can learn here. If you are coming to learn, why are you pretending you already know everything?” (Carol Gear 2013b).

I realise now that the research proposal goals did not explicitly state a frequently mentioned community priority: that everyone involved would learn more about plants, and that there would be ongoing community learning. I was so intent on being the learner in this relationship that I was surprised when people wanted to learn from me, too. I was hesitant to share my own learning out of concerns that my type of plant knowledge might negatively impact the way Makkovimiut shared their own plant knowledge. For example, people would often ask me to tell them the “proper” names for plants, a question I always felt awkward about being asked. I was here to learn about plants from a Makkovimiut

perspective, not introduce plant names rooted in the context of other places.

A story helps illustrate the foolishness of my fear that I would irrevocably change plant knowledge in Makkovik. I had read a vague description of a plant in a historical account of Labrador that was given a generic English name and no Inuttitut name. The identity of this plant was hard to establish in Makkovik. I asked many Makkovimiut what this plant might be but no one seemed to know for sure. Finally, one person said she knew exactly which plant I meant. Elated, I asked her if she could show the plant to me in person, to which she replied no, as she had seen it on APTN (Aboriginal People's Television Network). That was my first lesson that Makkovimiut plant knowledge is drawn from all available sources, and has been for many centuries. Makkovimiut plant knowledge has never existed in its own isolated little bubble. Knowledge is as likely to come from the Vesey's Seed Catalogue as it is from a family member. The origin of plant knowledge matters less than how useful the knowledge is in daily life. Ethnobotanical knowledge is flexible, adaptive and dynamic (Anderson 2011).

Being asked to contribute my own expertise with plants taught me that "sharing knowledge has to go both ways" (Louis 2007, 135). Carol emphasises this as well: "This is a two-way street: we are both learners, the researcher and the community" (Carol Gear 2012). Showing reciprocity means honouring community priorities in a practical way by demonstrating benefit (Bainbridge et al. 2015). If an important community priority is to learn, then researchers must honour this priority by participating in an exchange of knowledge (Runk 2014) rather than solely making knowledge withdrawals. In my case, I could contribute skills in plant ecology towards enriching knowledge of the plants of family places (Chapter 4), and my field botany experience positioned me to make links

between the knowledge of individual Makkovimiut plant mentors towards a community plant guide. I was able to communicate academic literature on nutrition through presentations at Elders' dinners and at cultural suppers, introduce Makkovimiut to more uncommon and unfamiliar plants in the region, and be a resource person when someone found a plant they did not recognise. Sometimes the choice is not entirely between going as a learner and going as an expert, but by meeting somewhere in the middle as "co-producers of knowledge" (Farrelly and Nabobo-Baba 2014, 323; also Graveline 1998).

Carol talks about how the give and take of learning is what propels learning forward:

Learning is a wheel, always going around. Knowledge needs to be shared for the wheel to move, for it to be in constant movement. If you're not willing to share what you know, you're not helping the process. There has to be a constant flowing. If you want to keep the wheel going, your spokes got to be greased on both sides. If a spoke pops out, it already needed to be repaired before that happened. One example of this is when a researcher is not pulling their weight. Or a spoke can pop out for other reasons too, legitimate reasons, like a death in the family. So if that's the case, then come by with a card and help fix the spoke. When spokes pop out it keeps the wheel from turning, and then no one is learning. The biggest part of learning anything is the give and take (Carol Gear 2016a).

Just as we learned from each other, so too did we all learn from plants. In this work, land is also mentor and "author-ity" (Bawaka Country et al. 2015). Learning about "the stories plants tell about people" means trying to understand what plants have to teach. Kovach relates the words of Blackfoot scholar Narcisse Blood, who "spoke about places as being alive, that they are imbued with spirit and are our teachers" (Kovach 2009, 61). Early on in this research, I was advised not to be afraid to ask for help from all sources, including plants. It is important that the same humility be brought to learning from plants as to learning from human mentors. This means showing reciprocity in relationships with plants. Makkovimiut show reciprocity with plants in principled behaviour: harvesting conscientiously, not being wasteful, and

sharing what they harvest. I have tried to emulate these respectful relationships with plants in my actions on the land, including the way I have handled, harvested, and returned plants and soil, as well as in sharing harvested plants with Makkovimiut. I hope that learning from the land in this way can demonstrate a broader reciprocity to Makkovimiut, in working to apply and communicate respectful practices in plant ecology that may help inform others.

2.5 Methods

In Indigenous methodologies, research methods must help fulfil obligations of relational accountability. Methods are therefore not simply tools that generate data, but are the tools with which a researcher builds relationships and helps fulfil these obligations (Wilson 2001). Methods are evaluated not just by the validity and reliability of the data they produce, but by how effectively they build relationships (Wilson 2001), and by how well they serve the community (Weber-Pillwax 2001).

From this perspective, methods are more than enumerated steps in a research project - and that makes describing methods problematic. As much as researchers want to be transparent about their methods, many of the moments that collectively build relationships with people are private and personal, and may not be appropriate to share in print. Other people in the research relationship have a right to privacy and respect, especially for those moments in which they share most deeply of themselves. I used to wonder why methods sections in papers often seemed so lacking in detail, but I now understand that sometimes this is out of respect and care for others. Methods sections may also be lacking in detail if researchers approach their work with humility. How can

a researcher possibly remain humble and honour private moments by trotting them out as evidence of how hard they worked at fulfilling their obligations in a research relationship? Kovach writes:

Much of the sacredness of our research would never appear in my written research document – family gatherings, kind words, friends, smiles, teasing, tears, teachers, a deer sprinting across the open prairie, or manitow giving energy when I could go no further. These experiences constitute meaning that cannot be written, only felt, remembered, and at best spoken” (Kovach 2009, 140).

As Kovach suggests, certain methods may only be appropriate to share as spoken word, rather than in print. Sharing an oral narrative has implications for how academics affirm or critique the work of their peers, a discussion I return to in later sections of this chapter.

Before proceeding to a discussion of the project methods that are appropriate for sharing, there are two topics that have bearing on the iterative processes described in the next section:

Location: I live in Goose Bay, Labrador. To get to Makkovik, it is 1.5 hours by Twin Otter, 18 hours by ferry, 6-8 hours by snowmobile, or 10 hours by speedboat, depending on weather and conditions. There are daily flights between Goose Bay and coastal communities in Labrador, and people fly these routes frequently for visiting and to access medical services in Goose Bay and beyond. As such, it’s relatively easy for me to travel between Goose Bay and Makkovik. I can book a flight from Goose Bay in the evening and be in Makkovik for breakfast the next morning. Similarly, I can cancel and reschedule visits with little notice. This flexibility is a real advantage as a visiting researcher because it allows me to make more frequent visits, to stagger them seasonally, wait out weather holds, and to schedule around community events and the personal schedules of plant mentors (see also section 3.2.1).

My location helps me respond more respectfully to the “pulse of the community, so [I] can have good and appropriate timing ... [and have] a backup plan for research in case of unexpected events in the community” (Carol Gear 2013b). I believe my location is also a factor in building better relationships with people in Makkovik through degrees of shared experience. Living in Labrador, we share weather and seasons, foods and activities, news and music, and, through marriage, we share family connections. I want to be careful and clear here because I am not from Labrador, I am not from Makkovik, and can never espouse a Makkovimiut perspective (Rigney 1999). Makkovik and Goose Bay will never share the same historical or day-to-day context. But I believe that in living more closely to where I work, in kilometres and in context, gradually I can bring more of a lived understanding to my learning.

Language: English and Inuttitut are both spoken in Makkovik. Most bilingual speakers are Elders, and the mother-tongue of many younger community members is English, which is generally the language of business and instruction in Makkovik. Bilingual speakers declined to have an interpreter present during discussions, and so all discussions occurred in English. Community reports were translated into Inuttitut and printed copies in both languages were delivered to all plant mentors and participants. Because discussions were held in English, it was possible for me to communicate directly with plant mentors in person and by phone, and this made it easier for me to repeatedly follow-up on conversations and verify the accuracy of notes. Working in a shared language also meant that relationship building was direct, without the intermediary of an interpreter, which I believe helped everyone get to know each other more quickly.

2.5.1 Learning from people

2.5.1.1 Different ways to meet and talk to people:

Initially, advisors like Carol, Janine Lightfoot (former Economic Development and Tourism Officer, Makkovik), Errol Andersen (Lead Conservation Officer, Nunatsiavut Government Makkovik), and AngajukKâk (Mayor) Herb Jacque recommended plant mentors to approach in Makkovik. There was usually a strong consensus amongst these local advisors on who in Makkovik was knowledgeable about plants. As I began speaking with plant mentors, names of family and friends emerged in their narratives, and they also began to recommend people to speak with. This is sometimes called snowball sampling (Bradshaw and Stratford 2010), or network sampling (Bhattacharyya 2012). In Makkovik, relational sampling (Kovach 2009) is an apt term because it places the responsibility for sampling success squarely on the shoulders of the researcher, who either has existing relationships with community members or must demonstrate trustworthiness in the research relationships they build. Relational sampling acknowledges that Makkovimiut also had to choose to work with me based on their initial impressions of my approach and methods in their community. Relational sampling later shifted the selection process more firmly to Makkovimiut: for example, people would approach me after events, presentations at the community hall, or Elders' dinners to share something about a plant they knew, and to express interest in being involved in the project. I had very little success in phoning people cold and asking permission to speak with them about plants, and much greater success when I met people face-to-face while walking on the road, getting groceries, or at community events.

2.5.1.2 Conversational methods

Most conversations occurred in people's homes and were one-on-one, or with one or two additional family members. The way in which discussions happened with Makkovimiut plant mentors could best be described as open-structured conversational method (Kovach 2009), which relinquishes control of the discussion in deference to the importance of the stories a participant wants to tell (Kovach 2009). In some traditions, this method is also known as yarning, which is sometimes described as "the telling and sharing of stories and information" (Bessarab and Ng'andu 2010, 38). Carol also speaks to the importance of allowing people to tell their own stories unbounded by the topic areas of a directed interview, to everyone's benefit: "Rigid professionalism is counterproductive. You take more in if you are open-minded, and don't cut people off. For example, don't say to someone 'We're only going to talk about these questions, no we don't need to talk about that'" (Carol Gear 2013b). A conversational method typically takes more time and repeat visits than structured interview methods (Kovach 2009). I did use topic areas in the beginning to provide some structure to introductory discussions (Appendix U), and in order to respond to the advice that "researchers can also act respectfully by being clear about their research focus so that community members are well-informed about what is being asked of them" (J. Lightfoot, pers. communication, 13 November 2012). Conversations became more open-ended with more frequent visits, as people became more accustomed to me as a visitor and introduced broader areas of discussion. The transition to a more shared steering of conversations was a positive step towards more respectful research relationships, especially with Elders (Thomas 2005, Wilson 2008).

2.5.1.3 Walking

When it was possible, the same conversational approach was used outdoors. Learning about plants while outdoors was appropriate because plants, like people, exist in an extended network of relationships – in habitat. Not only are boundaries between plants and habitat blurred in many Indigenous taxonomic systems, but plants become unfamiliar and harder to identify once they are removed from the context of their habitat/their relationships (Ager and Ager 1980, Dritsas 1986).

To learn about plants, I would follow Elders on a plant walk (Hitchings and Jones 2004, Anderson 2005), either in their yard or garden, down a path in town, or around their family cabin outside of Makkovik. A short comment while walking in these places was packed with learning. When out at her family home in Ben's Cove, Aunt Annie Evans saw a willow and remarked:

The willow flowers are nectar for the bees before the bumblebee flowers are in bloom. Bumblebee flowers are open sooner in town than at the cabin. The bumblebee flowers tell you that the bakeapples are ripe. When bumblebee flowers are in bloom, it's time to pick bakeapples. That's what my Grandfather [Mr. Harry Andersen] told me. That was always the rule of thumb (Aunt Annie Evans 2015d).

Later on, I tried to look at the comment with an ecologist's brain, and I made a list: three plant species, seasonal phenology, plant-pollinator relationships, the effects of habitat on phenology, and phenological indicators for optimal harvesting time. Being outdoors, when plants are in context with their relationships, helps to encourage a rich narrative, one that is harder to evoke when seated at a table (Aalasi Joamie, in Ootoova et al. 2001). There are physical limitations to working outdoors, however, and these may include the health and mobility of Elders, as well as adverse or unsafe weather conditions.

2.5.1.4 Apprenticing

Plant knowledge in Makkovik is actively practiced, so sometimes it was more natural to learn through working with plants than it was to ask about plants in the abstract. I helped make spruce beer, make a smoke pot to keep away the flies, smoke fish with blackberry sod, cut wood, pick berries, turn snowshoes, and make plant dyes. I would gather plant materials on behalf of Elders, help prepare the plants, and clean up afterwards. I learned to share what we had made, either by physically bringing a jar of spruce beer to a neighbour, or by sharing some of these apprenticeships by slideshow at an Elder's dinner or community presentation.

All of the apprenticeships took place over many days, especially learning how to make snowshoes. This gave us lots of time to talk about plants and to get to know each other in a "lived relationship" (Debassige 2013) where new topics and new avenues for learning opened up as we went about our work (Bawaka Country et al. 2015), and where learning could happen by watching and doing, rather than asking questions (McGrath 2003). Returning to work on long-term projects demonstrated commitment and interest, and it gave Elders a chance to explain through actions instead of words, in the way most Elders had themselves learned their skills: "We never asked one question growing up. We just patiently watched what our Elders were doing when we were kids" (Carol Gear 2013b). Carol explains that Elders were busy with the work of day-to-day life, with the "work of necessity" that they had no time to describe out loud what they were doing (Carol Gear 2016b). Instead of teaching with words, Elders teach through actions (Carol Gear 2016b). Shared practice is therefore the most important mechanism for learning not only particular skills but the stories, histories and values that are connected to skills. As

Carol says, “Stories come from *doing* things, knowledge comes from *doing* things, not reading every book in the library. When you experience what you’re learning instead of just reading about it, then you’re learning. You’re right in the middle of what you’re doing” (Carol Gear 2016b).

Apprenticing as a method may just sound like participant observation (Kearns 2010). I believe there are differences. Apprenticing is explicitly skill-based, whereas different types of participant observation may include, but do not necessarily require, learning by doing. An apprentice wants to learn a particular skill because they have a passion for it; they don’t participate in the skill simply as a means to another end. An apprentice also approaches relationships as a learner, as a novice, in acknowledgement of the expertise of the mentor, rather than from the equal position of a participant. Perhaps it is entirely semantics on my part, but I would never want to say to a Makkovimiut plant mentor, “I am here to observe by participating.” Similarly to my discomfort with the terms informant, participant, collaborator, or knowledge holder, I simply do not feel comfortable with the language of participant observation.

2.5.1.5 Group discussions and events

Group discussions of between five and fifteen people were one of the most animated ways to speak with plant mentors, and were very effective in bringing individual plant knowledge back into community circulation. As a common method in qualitative research, focus group discussions can be similar to talking circles (Wilson 2001) and are therefore sometimes incorporated into Indigenous methodologies (Wilson 2001). In one instance during a group discussion, we used a sequence of plant photos to see if we had

collectively missed talking about any species, as a sort of photo elicitation (Harper 2002). It was immeasurably rewarding to hear exclamations of, “Oh, I had forgotten that!” when plant mentors reminisced about plants with their neighbours. I was glad for the opportunity to have a range of discussions, from one-on-one meetings to large groups, because individually talkative people sometimes become unexpectedly reserved in large noisy groups. Carol recommends speaking with people in different formats and settings in acknowledgement that no single type of discussion will work for everyone:

A lot of people are not comfortable talking one-on-one. In groups, ask people directly and give everyone a turn to speak. When you’re used to listening, you’re not always ready to volunteer to speak up. We grew up listening, and many people are not going to speak up unless they’re asked. It’s good to have informal group discussions, and not just more formal public meetings, so it’s not such a big deal for people to talk and ask questions. And try to get to know people in different ways – ask them to show you a craft, for example (Carol Gear 2015c).

As Carol explains, people often have a lot to say, but a public meeting is not always the place to say it, especially in a small community (Carol Gear 2016b). What people say does not only depend on the venue or that precise moment in their day. It also depends on who is listening, which is why “there is a time and a place to say something, depending on the audience” (Carol Gear 2016b).

2.5.1.6 The power of story

Carol insists that, “While you’re learning, you should also be having fun” (Carol Gear 2015c), and there was a lot of laughter during conversations and apprenticeships. There were also quiet and sad moments, as discussions stirred memories of places and people far away, or those who had passed on. Plants are generally considered to be a fairly apolitical and benign topic in Labrador, at least in comparison to other related research in

fisheries or wildlife. When I completed research ethics applications, I did not anticipate that discussions would burden people emotionally. I was therefore unprepared when stories about plants sometimes lead to emotionally difficult moments for mentors. I had not considered how strongly plants were linked to place and to memory, especially for Elders, some of whom had experienced forcible relocation from their home communities, and almost all of whom had left home to attend boarding/residential schools. If I could offer a caution to others considering similar work with plants, it would be to not underestimate the power of story to unlock emotion (Kovach 2009), no matter how gentle the topic area may seem; and to consider what kind of supports the research project can provide when difficult emotions surface. Carol advises that researchers respond to these moments in ways that continue to respect the knowledge of plant mentors:

When you're going through reliving a traumatic experience, you shut down a bit, until you can find a way to snap through it. If you're speaking with someone and you notice they're having trouble, follow up with another question – like, 'Do you remember that plant at any happy times in your life?' Then you're acknowledging what they're saying and giving them the opportunity to go on to something not as sad, to share their knowledge on a related topic. Help them make the small switch. You're still respecting their knowledge, and you're helping them make the small switch in a positive way" (Carol Gear 2015c).

2.5.1.7 Documenting and storing

Audio recording, note-taking by hand, photography, and memory recall notes were used during and after conversations to help document cultural plant knowledge. Most early conversations were recorded on a digital audio recorder. I took written notes when plant mentors expressed hesitancy to have their voice recorded, or showed a preference that I take notes by hand. I took photos of people working with plants after asking permission.

Taking notes by hand offered certain advantages that audio recordings did not. It's

a technique common to students and learners, one Elders themselves used in school. It seemed that Elders were more at ease when there was no audio recorder between us, and the conversations were more relaxed and less formal as a result. Taking notes by hand helped me to more quickly understand the natural cadence of someone's pattern of speech, as I was too preoccupied writing notes to accidentally interrupt. When I put down my pen during more private comments, it was clearly visible to Elders that I was not recording sensitive information, and that I understood this knowledge was not appropriate for a general audience (Louis 2007).

Of course, the advantages of audio recordings are also numerous: the value of having a much-loved Elder's full and original narrative in their own voice is priceless to families and to a community's archives. Audio recordings allow for direct transcription rather than paraphrased notes, and transcripts can retain more of a speaker's voice, although they are incapable of communicating emotion in the voice. How does one transcribe the moment when an Elder is describing the scent of Labrador tea and audibly inhales at the memory? How does any print medium capture that expression of the memory of scent?

There were occasions during discussions when I did not take notes of any kind, but simply listened. As the project progressed, I was surprised that instead of finding it easier to ask permission to record a discussion in audio or writing, I actually became more reluctant to ask. As I got to know people better, I felt as though I was visiting as a guest or friend. It felt impolite to visibly turn the visit into work by taking out a notebook or recording device. Instead, I would try to recall important plant-related details after the visit, and write them down at the earliest opportunity. I would then bring these notes on

my next visit and wait until I felt the moment was more appropriate to review, correct and add to them.

With the permission of each mentor, audio and written transcripts will eventually be stored at the White Elephant Museum in Makkovik. The museum is local, accessible, and locally curated. These conditions help support Makkovimiut as gatekeepers for the collective plant knowledge of the community (Thompson 2005).

2.5.1.8 Ethics and consent

For me, understanding what it meant to have informed consent was one of the hardest parts of this work. Initially I used a template from similar community-based research, modified it, tried to simplify it, and had it duly approved by my university Research Ethics Board (Appendix R). Though I was the author of this revised version, it made me uncomfortable. I practiced explaining it before going to meet with plant mentors. During an introductory visit, when it came time to introduce the topic of consent and I brought out the form, people either waved dismissively at it and asked me where they should sign, or seemed worried by what might be in the small print. After discussions with Carol and Gita, and the approval of the Carleton Research Ethics Board, I moved to an oral consent process that transformed the written consent form into key points in an oral script (Appendices S, T). Transforming the fine print into a verbal discussion made the consent process less unidirectional. Plant mentors and I actually began to focus on a point-by-point discussion of consent issues—for example, how mentors wanted to be named or acknowledged, direct quotations, storage of transcripts—rather than where signatures went on the form, and I felt marginally better about the process.

In following an approved oral consent process, I now had what constituted informed consent for my research by the standards of my university. I continued to feel uneasy. Was I clearly explaining every consent consideration each time? Did the oral consent process pressure plant mentors into replying on the spot without deliberation? Did I even know how far electronic media could travel? How could people possibly give consent to share words they hadn't even spoken yet? The informed consent sought by the university seemed better suited to protect the university and myself than Makkovimiut (and the same held true for liability release forms I was advised to develop for local guides and for a local student research assistant).

Because different kinds of knowledge are appropriate for different settings (Louis 2007, Lambe 2011), I check with Elders individually each time I would like to write or present something that will share their words and identities, to make sure I am using their approved transcripts in an appropriate context. This includes conference presentations, my comprehensive exams, and this dissertation. Meaningful issues and messages need to be brought up repeatedly to make sure they are understood and remembered (McGrath 2003, Beaulieu 2012, Runk 2014). This iterative consent process has both personal and professional benefits, in that relationships are constantly being renewed as permissions are repeatedly checked.

In some instances, checking consent repeatedly with people could potentially have the opposite effect and induce worry, rather than instil confidence. Feeling the need to repeatedly check consent may happen more in cases of oral consent, where there is no physical signed document to indicate that consent has been given. In my experience, an iterative consent process provided me the chance to build trust, better explain the project

as it grew through increasingly rich narratives, and allowed Makkovimiut plant mentors time to appreciate and understand the role of their contributions in the context of a growing story of collective plant knowledge. Some plant mentors chose to change the way they were acknowledged, from the more anonymous “Makkovimiut plant mentor” to their name when they saw the printed context in which their words would be shared.

Many authors have discussed the need for an expanded view of ethics and consent in research with Indigenous communities (Smith 1999, Ellis 2007, Kincheloe and Steinberg 2008, Kovach 2009, Hall 2014, Healy and Tagak 2014), one that “makes the researcher responsible, not to a removed discipline (or institution) but rather to those studied” (Denzin et al. 2008, 15). I can appreciate why some Indigenous scholars insist that research in Indigenous communities should be the responsibility of members of that community (Wilson 2001, Steinhauer 2002). It can come down to a question of loyalties. Are your obligations greater to your community or to your university? Ethical behaviour has a different meaning when you have to live alongside the people with whom you work, when you yourself are not an autonomous unit (Meyer 2001).

For these reasons, Carol believes that the consent process is and must be different for community researchers than for visiting researchers: “A person who’s from the community who is doing a survey gets consent right away because of trust. But visitors should get consent *after* they come back with transcripts” (Carol Gear 2015c). In this model, there are multiple stages of consent and approval: initial consent to speak, approval of transcript accuracy and suitability, and quite possibly repeated stages of consent to verify revisions. Multiple visits and iterative consent “makes the writing more fair because you’re getting closer to the situation than just one interview or impression.

It's not helping research at all if people are misquoted or if it's misconstrued based on the researcher's own context" (Carol Gear 2016b).

This iterative consent poses a risk to researchers in that the time and effort they invest in discussions, transcription and visits may not be academically useful to them if consent is withheld at later stages of the relationship. If this process builds trust, develops research relationships, and improves everyone's understanding of consent, I believe it is a risk that must be taken.

2.5.1.9 Transcribing

I transcribed audio files myself, and I am glad I did because it was only in hearing some stories over and over again that I began to understand them. I tried to transcribe the audio as literally as possible to keep the storyteller's voice whole (Kovach 2009). Though at times I was dismayed at the slow pace of my transcription, transcribing also generated powerful moments of gratitude in me (Kovach 2009). At these times I would often pick up the phone and call the plant mentor whose voice I was hearing to say thank you. I feel that doing the transcriptions myself helped deepen my relationship with plant mentors, and gave me repeated chances to express my gratitude.

2.5.1.10 Verifying – Talking and checking goes in a circle

Research seems very linear when you read about research projects in an article or a book. The structure of this article is no different. The stages of learning about plants from Makkovimiut seemed like they would be a similarly linear process: talk, verify, analyse. But after I visited plant mentors with the first round of printed transcripts in hand, the

straight line of research began to curve into a circle. As we reviewed these initial audio transcripts together, there were spelling corrections to make, inaudible blanks to complete, and sensitive information to strike. But when plant mentors reread their own stories, they almost always added additional detail or completely new information. I made notes from these verification discussions, revised the transcripts as per their instructions and comments, and when I next brought the revised transcripts and notes back to review, the same thing happened again (Lightning 2002).

Walking outdoors amongst plants was a way to stimulate conversation about plants, and sometimes I brought photos as a still-life version of the outdoors, to similar effect. In the case of the audio transcripts, and later written notes, the printed stories themselves acted as a type of “story elicitation” for plant mentors, so much so that it was hard to tell where one conversation ended and another began. These iterative discussions blurred the lines between discussion, transcription, and verification. On repeat visits, mentors would often say something to the effect of, “I was thinking about what we talked about last time, and I remembered that...”, which to me speaks to the value of a rest period between related discussions, where latent thoughts are allowed time to surface. This rhythm was easier to achieve because of my proximity to Makkovik and the frequency with which I was able to visit. Visits to verify the content of previous conversations were especially important for notes I had written from memory after a visit was over, as these were not a verbatim transcript of a mentor’s words. I was able to use notes written from memory as a discussion aid on subsequent visits, when we could fill out more details in the conversation and sometimes confirm verbatim quotations.

An unexpected benefit to notes written from memory and then verified in person

was that plant mentors could see I had been paying attention to their stories in informal contexts, too, and not only during scheduled visits. Carol describes this process as a way to “keep open ears for what people have to say” (Carol Gear 2015c), and she describes it as an important method in showing sensitivity in research and in day-to-day life:

Understanding human nature is the key to any good research. A person’s context changes every day. Researchers need to be aware of what a person’s attitude is on different days, in different situations, and how it will affect what they say. You have to keep open ears for their viewpoints on all days, not just one. Keeping open ears is not just so you can get “information” but so you can understand what’s going on with them as people, to see how they’re doing. Listen with your eyes, your senses, everything. Take things from people’s demeanour. Keep open ears as a researcher and a human being (Carol Gear 2016b)

First and foremost, keeping open ears helps develop the relational skills that Kovach describes as so important in long-term research relationships with Indigenous communities (Kovach 2010). As a learning technique for particular topics, such as cultural plant knowledge, the process of keeping open ears should be used with caution. Carol points out that this method is only appropriate when you have a follow-up discussion to verify and expand upon your memories of a conversation. Otherwise, imperfect memories will yield misinterpretations of what someone said. Even not knowing someone’s sense of humour can generate misunderstandings: “Imagine we’re at the store by the spices, and I say to you, ‘Oh, we used to grow that one here.’ I was only joking, but there you go and you write it down” (Carol Gear 2016b).

Repeatedly verifying transcripts and notes also gave plant mentors the opportunity to fine-tune their consent. They could point out which sections of transcripts or notes were ok to share, parts of a discussion where they would rather be acknowledged more generically, and information that should be kept only in their own personal written copies

of the discussion. When a plant mentor was satisfied with a “finished” version of our discussions—one they would feel comfortable having publicly accessible—these documents were considered ready to be stored in the community archives of the White Elephant Museum. Through this iterative process, I gained more confidence that transcripts and notes were as detailed and accurate as possible, and that I was respecting the wishes of mentors regarding content and consent. While a “finished” copy of transcripts would become part of a community archive, the context in which the stories of Makkovimiut plant mentors would be shared is part of an ever-renewing discussion.

2.5.1.11 Understanding meaning

“Gathering knowledge is an intrinsically rewarding aspect of research. Interpreting data and presenting those interpretations is less congenial for many researchers” (Kovach 2009, 129). Kovach’s insight into the anxiety that accompanies analysis rings very true for me. The dawning realisation that I would one day have to put some of this work into print, and the worry that in doing so I would make hurtful mistakes, literally gave me nightmares. I was acutely aware of the trust that had been placed in me by Elders, by plant mentors, by Makkovimiut. I was grateful, and I could also feel the weight of it.

One of my major fears was that I would distort knowledge when trying to make meaning of collective plant knowledge. By this I mean potentially seeing patterns where there were none, missing patterns that did exist, or stripping voice and context from knowledge through generalisations. Indigenous scholars write feelingly about the challenges and discomfort of trying to bring story into the realm of academic analysis (Stevenson 2000, Meyer 2001, Kovach 2006, Wilson 2008, Kovach 2009), where the

stated aim of analysis is to decontextualise knowledge into bits of data (Kovach 2009). During my MSc, I already struggled conceptually with transforming living plants into data, and my reluctance has grown as my work has grown to include people. I can't empathise with the struggles of Indigenous scholars who must make meaning in academia whilst simultaneously fulfilling their own community or tribal obligations. My dilemma has been that I must try to make meaning as a non-Indigenous researcher working with an Inuit community, without adding to a legacy of extractive and decontextualized research (Smith 1999), and while upholding personal ethics and reputation in a region I both work and live in.

What helped connect me most to the stories themselves was the priority research product, the community plant book. I thought about the community plant book and asked myself these kinds of questions: What would a plant book for Makkovik look like? What content would it have that would be useful? How would this book and its content be made to feel familiar to individuals and families? How could it best reflect Makkovimiut? Makkovimiut stories about plants are often set in the context of practice. Plants are central in activities like wooding and berrypicking, and they also support practices such as fishing, hunting and travelling. I looked to thematic grouping (Kovach 2006, Guest et al. 2012) to help understand plant practices and the cultural conventions that guide them. In many cases, themes for my dissertation and themes for a Makkovimiut plant book are identical. Both Chapter 3 and a Makkovik plant book are structured around species-specific cultural plant knowledge, and plant knowledge in the context of practices such as fishing, hunting, travelling (Appendix V). The two works share how people care for plants (plant management); and how plants relate to sharing, teaching, community values,

and respectful behaviour. Some themes are only intended for a Makkovimiut plant book, and these themes involve plant knowledge relating to specific family places, and to specific families. The level of detail of geography and family history is more relevant for a Makkovimiut audience than an academic one.

Themes were written down on an ongoing basis throughout discussions and plant ecology field work. I used NVivo 10 to help organise stories and content from audio transcripts and written notes into these thematic groupings. I then invited community members to review these themes at a community workshop, where we discussed whether the sections reflected the range of Makkovimiut relationships with plants. I presented revised themes twice more at a community dinner and a community hall presentation, with audio clips and quotations to give examples of content that fit within each theme.

Themes developed iteratively through the ongoing cycle of discussions, transcriptions, reading, and reflection (Kovach 2006). Verification of this thematic approach worked itself into ongoing loop of discussions and checking transcripts and notes with Makkovimiut plant mentors: if someone suggested a new theme, it often presented opportunities to ask new questions about an overlooked area of plant knowledge, or identified new people in Makkovik to speak with. Iteratively checking this thematic analysis with plant mentors ensured that I was working with book sections that would be recognisable and relevant to Makkovimiut, and that I continued to be on track as a researcher (Wilson 2008). Checking in also gave Makkovimiut a chance to be involved at a more developed stage of the research, and to see how their particular contributions fit into the larger project. Several people commented that they were so used to working with their own window of knowledge that they hadn't realised how big the

story became when you brought everyone's plant knowledge together in one place. There was a sense of collective pride at the sum total of knowledge, rather than the individual pride of personal contribution. In these moments, I truly felt the power of this analysis had "less to do with capturing 'truth' or drawing general conclusions, than the reconnecting of self, family, community" (Martin 2003, 15).

2.5.1.12 Communication

One final item that I feel is vital to discuss in a methods section is communication. Communication has to start at the very idea of a project (Carol Gear 2012), and it needs to be an ongoing effort with everyone in the research relationship. Carol states it succinctly: "Don't even do the work if reporting back is not going to happen" (Carol Gear 2013b). This is especially true when partnering with community researchers, because "it puts them in an awkward position in their community" (Carol Gear 2013b) if visiting researchers fail to uphold communication promises. Any findings need to be approved by the host community (Louis 2007), not simply to ensure accuracy and sensitivity, but to maintain and strengthen the relatedness of community participants to their work (Martin 2003).

Research reports need to be physically accessible (Carol Gear 2013b) and available in the language of the community. Writing style also needs to be accessible to readers. The language we choose is part of how we allow others to evaluate our intent and our actions, and how we ensure we are transparent. This is true for ensuring that consent is indeed informed, and it is true for how we represent our work and our relationships with other people in print. Will an Elder be able to recognise herself in the way her words have

been put into print? Carol cautions, “It’s no good to use big words and be too analytical” (Carol Gear 2013b). Keeping language accessible is part of being respectful and fulfilling one’s obligations in the research relationship (Louis 2007). It may also help researchers “find ways of sharing their knowledge while remaining humble” (Ruwhiu and Cathro 2014, 6).

Honesty is part of communication and respectful representation (Louis 2007). Researchers need to ask ourselves, do I have the right to speak to this? If an Elder reads this article, would I be ashamed of anything I have written? When I was writing my comprehensive exam, I knew that Carol would read it. This realisation made me think very hard about what I was in a position to say, and what I had no business writing. Keeping others in mind while writing and having work scrutinised by community members and Indigenous scholars will help writing aim towards a “high standard of care” (Cameron 2015, xx), and keep researchers mindful that “[i]f we choose to write our research findings, then we must find form and content that honours them” (Kovach 2009 129). This high standard of care is not only necessary for contemporary readers, but for future readers, such as the children and grandchildren of Makkovimiut plant mentors. In her doctoral dissertation, Cora Weber-Pillwax writes of the devastating personal effects of unexpectedly coming across a distorted representation of her Grandfather’s narrative in an anthropological article, and of the effects on her family (Weber-Pillwax 2003). Carol has every right to ask, “If [my daughter] is at university and reads this in 15 years, will she get meaning from it? What meaning will she get from it?” (Carol Gear 2016b). I was once advised that scholarly writing should be accessible to all, and that to work towards this one should write as if one’s Grandmother were reading a scholarly paper (C.

Aporta, pers. communication, 20 January 2011). I would agree, and add that we can also write as if future generations were reading.

Working with Makkovimiut plant mentors to respectfully communicate research is not only a continued part of the verification cycle, but is itself a path to further learning. In January 2016, while I was in Makkovik to review a draft of this dissertation with plant mentors, I worked with plant mentor Aunt Nellie Winters on a way to visibly illustrate people-plant relationships. Aunt Nellie Winters is a well-known artist whose sewing, embroidery, and grasswork is exhibited in galleries, museums and private collections both in Canada and internationally. She is also a skilled illustrator, especially of Inukuluks (little people) that are often used in embroidery. Aunt Nellie drew a series of Inukuluks to show some of the many ways that blackberries are present in daily life, as well as the ways that plants support practices such as fishing (please see sections 3.3.1, 3.3.2). Many of the scenes she drew were plant practices she herself had described many times before. Even still, new details about plants emerged as Aunt Nellie explained each part of the scene she drew, and told stories about the memories behind her illustrations. Finding collaborative ways to communicate plant knowledge further enriches learning, relationships and the wealth of a collective knowledge.

2.5.2 Learning from people and plants

Just as I initially had to learn how to learn from Makkovimiut, so too did I have to learn how to learn from plants. It was personally meaningful for me to learn from plants directly, but this learning also had to be in service to research needs in Makkovik. The community research priorities shared during preliminary discussions included a broad

interest in learning more about the plants of family places. This interest became the foundation for work in plant ecology, which looks at the plant communities of family fishing places (Chapter 4).

It was not enough to develop ecological questions rooted in community research interests. The entire design for work in plant ecology had to be informed by cultural knowledge and local context. I first needed to learn about land use practices before I could think about ways to look for the ecological signals of those practices in plant communities, and this learning comes primarily from cultural knowledge. The learning sequence—cultural knowledge precedes ecological knowledge—respects Makkovimiut knowledge and experience as the authority on their history in this place. Ultimately, the success of work in plant ecology depended on how successful my methods were in working with Makkovimiut on documentation of cultural plant knowledge.

From September 2012-June 2014, I travelled extensively by boat (and occasionally by snowmobile) with guides Sheldon Andersen and Todd Broomfield, and also with Conservation Officer Errol Andersen and other Makkovimiut plant mentors. They took me to family homes in the coves, bights and islands around Makkovik, where families lived before resettling to the town of Makkovik. These family homes were frequently at the heart of conversations about plants, and they are the places where many Elders first learned about plants. From many hours of discussion on boat and walking over land, I learned where the cod traps were set, where ships would moor, how grasses grew where people had lived, where the raised beds of an old garden were still visible. My guides pointed out to me patterns of vegetation, like how hemlock (*Angelica atropurpurea*) grows well at sod houses.

I experience the land much differently than Makkovimiut. My vision has developed along different cultural lines than people who live in this land (Meyer 2001). Not only are my physical senses differently attuned, but my vision also lacks the overlay of personal family history and experience. Without guides to help me learn to see the land, I would have missed things that were physically there but functionally invisible to me. I would also have been blind to the intertwined cultural and ecological history of the land. As I spent time in these places with knowledgeable guides, “the history of the land became alive with people and their stories” (Weber-Pillwax 2001, 171). Only in July 2014, two years after speaking with plant mentors, reading and rereading transcripts and notes, and spending time on the land did I feel ready to formally start work in plant ecology.

2.5.2.1 Plants as teachers

Plants are teachers in many Indigenous traditions (Gardner 2000, Kimmerer 2003, Tinker 2004, Clarke 2007, Bawaka Country et al. 2015). I was advised early and often that to learn from plants, I had to be outdoors in them. I had to become familiar with their forms, their habitats, their changes over the seasons. I had to commit myself to a “methodology of attending” as some authors describe it:

Methods such as storying and exchanging talk are most often used amongst People but methods for interacting with other Entities (e.g. Animals, Weather, Skies) are equally necessary. This requires fieldwork that immerses the researcher in the contexts of the Entities and to watch, listen, wait, learn and repeat these processes as methods for data collection” (Martin 2003, 15).

Learning by attending reminds us that our ethical obligations in the research relationship extend beyond human beings. Calling attention to these responsibilities encourages others to broaden their understanding of ethical behaviour in research (Bawaka Country et al.

2015).

Learning about plants by being out in them, and the months of plant ecology work that followed, had important effects on my relationships with people in Makkovik. Elders were excited that I had seen their family homes, and that their stories could finally gain traction in the mental pictures I carried. We could look at my recent photos of their family places together, and this would often spark more stories about plants. They would ask me questions: How was my rhubarb patch? Did you see the brook? Are the bakeapples ripe? Carol observed that places didn't become real to me until I went there: "If you haven't been to Adlavik [a family place], then you're just talking about Adlavik. You can't start to feel what it means to people" (Carol Gear 2016b). When I was out with my guides for the day, they always took the opportunity to hunt or fish on the way, and when they shared what they had harvested with me, I could in turn share with others in town. The most special moments were when I could share berries or rhubarbs I had harvested at the family places of Elders. The work in plant ecology did so much more than enrich my own relationship with plants. It enriched my relationships with plant mentors and their families, and I believe it continued to enrich relationships between plant mentors and their family places.

2.6 Time

Time is critical to deepening research relationships, yet there is no minimum time threshold that guarantees successful research. Researchers need to "spend time here," learning what it is to be a human being in Makkovik (Carol Gear 2012). Just as plant mentors demonstrated their commitment to me through repeated welcomes, I also needed

to show reciprocity in ways that are valued in Makkovik. Relationships are actively practiced through sharing in Makkovik: people share what they harvest with Elders, and donate their time and skills to teaching and workshops. I likewise needed to be an active contributor to life in Makkovik and demonstrate “practical empathy” (Farrelly and Nabobo-Baba 2014). Some of these contributions followed-up on other identified community priorities, such as organizing workshops on plant practices and gardening, developing plant programs for youth, and presenting slide shows on local plants. Other contributions were less project-oriented, like baking for community suppers, writing songs for Jamboree, helping with Trout Fest activities, and doing yard work and gardening for Elders. I had a good idea that my visit frequency was adequate when I ceased to cause a commotion by walking down the school hallway. I remember one student looking into the hall and saying, “Oh, that’s just Erica” and it was a wonderful feeling to have become so unremarkable.

There were many times that I couldn’t offer any practical value to Makkovimiut, but I could at least demonstrate that I cared enough about the community to repeatedly want to spend time participating in it (Bishop and Glynn 1992). As much as researchers might like every moment of their time to be of meaningful service to a community, sometimes the most value they can add is comic relief: “When you were in the swim race, and people saw you trying to swim, that gave everyone a good laugh. That’s important, too! You’re not just taking but giving something back” (Carol Gear 2015c).

I believe that if research relationships are sincere and good, then researchers will simply want to spend time with the people they work with, which has the natural effect of further improving research relationships: “If you’re not interacting with the community,

you're not going to get very much out of your research. When people see you interacting with the community, they'll open up" (Carol Gear 2013b). Everything one does as a visitor in a community has the potential to strengthen research relationships and demonstrate reciprocity, including pursuits that appear completely unrelated to a research project.

I sometimes worried in the earlier stages of the project that there was not enough plant-related discussion in my conversations with people. These fears were especially present when I made very slow progress, time-wise, in transcribing long and wide-ranging audio interviews in full. But in listening to the audio files, hearing the emotion in someone's voice, I would viscerally understand that content was possibly the least important part of what I was hearing. Carol insists that researchers have important responsibilities in supporting Elders: "Give Elders opportunities to pass on their knowledge. Give your time to show that you value Elders. They are then encouraged to tell other people because of your interest in them and their experience" (Carol Gear 2013b). People listened to their audio recordings at home or read through their transcripts with family members. Elders talked about old stories with each other again, independent of interviews. All the stories, plants and otherwise, helped people build relationships with each other, and audio files and transcripts of these conversations were also valued as family archives.

Moreover, I realised that people were sharing their trust in me through their stories. As Kovach writes, "For stories to surface, there must be trust" (Kovach 2009, 98). If I had insisted on cutting to the chase, being strict with time, sticking more precisely to a list of subjects, maybe on balance I wouldn't have heard any more about plants at all. I

might have heard even less, and less often. The time it took to get to know people helped lay the foundations to support strong relationships in which personal stories could be shared (Steinhauer 2002). Makkovimiut plant mentor Mary B. Andersen says that visiting researchers who leave without understanding the depth of local knowledge may have not spent enough time getting to know the people they are speaking with: “Like any relationship, it takes time to say things to each other” (Mary B. Andersen 2016).

Kovach encourages researchers to have respect for the narrative when speaking with Elders, to let their stories unfold (Kovach 2009). The same is true of the larger narrative of the work. A research project is a small endeavour that depends on people and the strength of their relationships with each other. At a conference in 2014, almost two years after I had begun speaking with people in Makkovik about plants, I was asked if Makkovimiut actually hear the voices of plants. I didn’t know the answer - not because I wasn’t interested, but because at that time I had not yet had the courage to ask the question. Only several months later did I feel comfortable enough to speak with Elders on this topic. Research relationships need to be sufficiently developed before certain kinds of questions can be appropriately asked and answered, and all research participants need to have sufficient time to feel ready for these questions. Even with a cautious approach, there may be some answers that researchers are not prepared to understand, such as knowledge that requires a certain cultural context (Louis 2007, Blodgett et al. 2011, Lambe 2011). Researchers need to remember that they are not ready for all knowledge at all times.

It takes time to introduce yourself in an appropriate way, and to learn about a community and its research needs. It takes time to transcribe conversations and to check

accuracy and permissions. It takes time to write community research reports, write letters, update project websites. It takes just as much time for community advisors and guides to teach you, for Elders to speak with you, and for plant mentors to patiently wait as you hopefully learn enough to ask better questions – all with the hope that the time invested in a researcher might this time lead to some community benefit (Coombs et al. 2014).

It takes time to learn about plants, too: to think about methods, to visit and select sites, to find equipment, to take measurements, to work through collections at home, to transcribe field notes, to run and interpret statistical analyses. But more than that, learning *from* plants takes time, a different kind of time altogether. Learning by attending is not something that can be rushed, or that invariably happens in a short field season outdoors. The intuition and deep knowledge particular to experts develop through time and experience. It is this time and experience that, over life-long learning, prepare the senses to receive and interpret complex and interconnected signals in an intuitive way (Flyvbjerg 2001, Meyer 2001, Gegeo and Watson-Gegeo 2001, Kovach 2009). Learning from plants means being attentive to more than just plants, as important messages are sometimes communicated through other parts of an interconnected web of relationships:

You have to be aware of the connections and relationships which bring everything into being. You have to be attentive and open. You need to be alert to the world in all its complexity. The messages that animals, plants, winds send may be heard by humans or they may not. You see, those messages are not sent directly to humans because humans are not the centre of things (Bawaka Country et al. 2015, 275).

I can say in retrospect that valuing the learning that comes from being outdoors was excellent advice, but at the time it was challenging to follow. I felt the pressure of trying to make progress in my degree in a certain timeframe, and worried about what I had to show for the funding I was spending. I often wondered how all this wandering about and

waiting for illumination was benefitting anyone. I don't claim to have been very good at attending to plants in and around Makkovik. It's hard to attend and feel productive at the same time, as you try to be really, really present outdoors and simultaneously wait for the penny to drop so you can get on with your work. There are lessons to be learned here in allowing oneself sufficient time in a research project to simply attend, without having the additional pressure of having to produce numbers and lists at the end of every day.

Perhaps we can also borrow from astronomy in adapting the practice of averted vision, which involves looking slightly away from something in order to focus on it more clearly (Barrett 1977). In allowing the gaze to drift slightly from plots, polygons, and individual species, we may in fact see and understand more of what we are ultimately seeking to learn.

Much like spending time on pursuits seemingly unrelated to discussion about plants, you never knows how “unproductive” time makes you ready for some other epiphany. Quite possibly, I learned more about nutrient cycling by watching my guides clean fish at the shoreline than I did by running soil analyses. At times, maybe I started to touch on why the more we hurry to accomplish, the less we learn. As I reflected in a journal at the end of a day of field work: “It's special to have tea and smoked salmon and toast [made by Sheldon Andersen while out looking at family sites]. I have to remind myself not to hurry. I am sure that many years on I will ask myself why I was in such a rush.”

2.7 Implications for evaluating research

There is very real concern that Indigenous methodologies can be more of a cachet than a

methodology; that by aligning themselves with an “IM” acronym, researchers are seen to have done their due methodological diligence (Coombs et al. 2014, 851). Even with the most conscientious of attempts to learn from Indigenous methodologies, there is discussion as to whether the best-intentioned non-Indigenous scholars can ever truly understand or work according to them. If those of us who are non-Indigenous researchers can’t fundamentally understand Indigenous methodologies, how are we in a position to critically evaluate anyone else on the appropriateness and respectfulness of their research with Indigenous communities?

I don’t know how we can, fully, and not simply because some of us lack an Indigenous perspective. How does one assess relationships? University research ethics boards don’t have the ability to judge and pronounce upon one’s personal ethics throughout a research project (Hall 2014). Methods that might attest to broader personal ethics and behaviour can’t always be written for reasons of respect for privacy and humility (Weber-Pillwax 2001). Only community members can truly speak to the relevancy and appropriateness of research to their own community, and community members are not frequently asked for comment in the peer review process. So what exactly are academic readers qualified to assess in the methodologies of their peers? I believe there are two critical elements that must inform a reader’s understanding of research.

Firstly, a reader or reviewer can look for the personal meaning of the research. How did a researcher come to choose this topic? What is the feeling behind their intent? What is the personal place from which a researcher builds her relationships? Revealing personal meaning helps reveal one’s motive (Hampton 1995) and ensures that there is a

transparent purpose to the research (Weber-Pillwax 2003).

The personal meaning behind research can only be considered if it is shared. Sharing personal meaning can be very difficult. Non-Indigenous academics have learned that they are judged by their peers on the quality of their data, not the quality of their relationships. Consequently, there is very little incentive to disclose one's personal motives; in fact, there are strong disincentives. If researchers really want their research with Indigenous communities to improve, not only will they “have to be a human researcher – that means having emotion and responsibility” (Carol Gear 2013b), they will also have to find ways to disclose more of their personal motives in their writing and communication. This means encouraging each other to position ourselves and reflect on our actions throughout the research, and not just in the introductions.

Perhaps in learning to share our motives, academics might also learn to be a bit kinder towards each other. If we acknowledge that we always lack the complete context to fairly evaluate the work of others, we might reconsider the merits of our academic critiques, and temper them with a view to understanding where an author is coming from, or what is the origin of their personal meaning. Since many methods cannot be written, perhaps we need to find ways of sharing our methods outside of print, and make more time for speaking with each other and learning from each other in person (Weber-Pillwax 2001, 173; Kovach 2009). If we appreciate that we lack the authority, experience and insight to critique the methodologies of our academic peers in a truly informed way, researchers might also come to acknowledge that our praise for their work may be just as meaningless. Any measure of research success originates with communities, and applies to the entire research process as much as to any end product.

Secondly, a reader or reviewer can look for evidence that research questions come from a community, and that the research is wanted or welcomed by a community (Louis 2007). Many Indigenous scholars write that a good heart will lead to good research (Weber-Pillwax 2001, Wilson 2008), and it is truly remarkable that Indigenous scholars continue to have so much faith in researchers, broadly, after so much extractive and disrespectful research, some of it likely well-intentioned. It is not enough to state one's personal meaning. Researchers must try to be transparent about how research priorities were determined, and who has determined the research need. This will help researchers avoid the belief that "academic knowledge production must be used to benefit the community... whether they wanted it or not" (Louis 2007, 135). It is important that researchers demonstrate not only origins and relevancy of research questions, but also demonstrate that community relevancy was maintained throughout all stages of the project. As Kovach writes, intent and approach must both be there: "The elders say that if it comes from the heart and is done in a good way, our work will count" (2009, 8).

2.8 Community relevancy - Measures of success

I come back to Kovach's statement that good research resulted when "personal meaning was bound with community relevancy" (2009, 115). Understanding community relevancy starts during preliminary stages of research; understanding long-term relevancy requires that one evaluate ongoing project successes and benefits at the community level.

In Carol's view, "Measures of community success are only apparent in the long term. You don't know in the short term – you're just getting to know people and they're getting to know you" (Carol Gear 2015c). There are some basic measures of interim

success during the research process, however, and these can be very straight-forward: “Word gets around very fast – good and bad. [...] If someone passes you on the street with their head up, smiling, saying ‘Nice to see you,’ then you’re doing a good job. If they keep their head down – well, that’s not so good. If no one wants to meet with you... A community’s response will be a measure of the quality of your research” (Carol Gear 2013b). Carol suggests asking different demographics in the community for feedback on the project. If you get different answers by age, for example, the research may have been less successful for certain groups within the community (Carol Gear 2015c).

Successful research over the long-term will have “uptake in the community” (Carol Gear 2012). Uptake can be in the form of useful community products that engage people, take time to produce, and that therefore demonstrate care for the community (Carol Gear 2015c). Uptake can also be outcomes that “stimulate interactions with others in the community, for all involved” (Carol Gear 2013b). People will talk about plants more with each other, recognise plants on the boardwalk from a slide show at the community hall, or experiment with a new recipe. Carol describes these broadening project effects as “the project expanding itself, as people take knowledge and possibilities into new areas of their own lives” (Carol Gear 2016c).

There is no unit of measurement for these strengthened relationships, and they are often physically invisible to a visiting researcher. There will never be a big banner hung over the airstrip when I arrive that says, “Erica, this research is great, and we want you to know we are deepening our relationships with plants!” As Carol says, “success is lots of little things” (Carol Gear 2015c). The most I might hear about uptake in the community is in passing conversations: for example, when an Elder mentions that she is bringing a

picture of a plant we saw to the next sewing circle to show to the other ladies; when I hear a young person outside on their bike singing a plant song that he heard at Jamboree; or when parents describe the pride their child is taking in their contributions to the youth plant guide. Sometimes it is the smallest of moments which affirm that relationships between people and plants in Makkovik are strong and are strengthening, and that this work is of some value to some people.

Indicators of successful research are sometimes only visible when a project is finished. As Carol observes:

Part of the decision of ending your project is personal choice, or because of personal interests. Everyone understands that. But it's nice when people keep coming in, still keep their connections to the community. You're successful if you're keeping in touch not just about project related questions. If your project ends and people are still inviting you to come back, then you're successful (Carol Gear 2015c).

Successful research does not just rest on personality, or how likeable a person one is. If you are a generally nice person, but your work lack community relevancy or your interpretations are unfounded, you may not be invited back on charm alone. Similarly, if your work has benefit for the community, but your personal relationships with residents are undeveloped, you may also not be invited back. The quality of research is related to the quality of the research relationships; in fact, it depends on the research relationships. As Carol says, "If I'm not a nice person, if I am not approachable, then my credibility is gone" (Carol Gear 2015d). Without credibility—which is earned through your methodology—there is no trust, and without trust there is no story. Without story, there is no research. Strong relationships are therefore the means to and the ends of successful research. Evaluating one's methods and what they work towards may be more helpful

than looking for metrics of research success.

2.9 Concluding thoughts

In *Indigenous methodologies*, Margaret Kovach relates a conversation with a colleague who makes the point that “epistemology ought to be congruent with life choices in general, not just in research”(2009, 120). She reflects:

Was it ok to apply a worldview (e.g. feminist, Indigenous) to our research but not practice it in our lives? [...] I was reminded of the holism inherent in Indigenous epistemologies and thought of how we teach research methodology classes in Western universities. We assume that people can select methodologies solely in relation to a research curiosity without a reflection on the self. No wonder it can be a “head trip” (Kovach 2009, 120).

If personal meaning is truly to inform research, it is imperative that researchers consider if and how our methodologies and our lives can mirror and support each other. For me, this means nurturing relationships with people and plants that are close to home, and that strengthen my local connections to people and place. It means being mindful of ongoing and long-term responsibilities to communities (Newhouse 2008, Castleden et al. 2012), particularly in the context of existing relationships with advisors, guides and plant mentors in Makkovik. It means privileging the knowledge and voices of Makkovimiut in learning about plants, recognising that plants are also teachers, and working to strengthen relationships between people and plants. It means finding ways for my personal life to support research relationships, understanding that these research relationships shape and enrich my personal life, and participating in work that strengthens relationships, broadly. Perhaps the practice of basic tenants of Indigenous methodologies, such as reciprocity and relational accountability, can be further strengthened if our life goals and research

goals are mutually supportive.

For me, as a student, trying to match my life to my research and vice versa has also meant that I have been more community-oriented than academically-oriented. This is to some degree a natural result of geography: from home, I am 200 km from Makkovik, and 1400 km from my university. My life choices mean that I have gravitated more closely towards Makkovimiut, whom I see more often and spend more time with, than to my academic peers. As I ask myself if I am working hard enough at building relationships in Makkovik, I sometimes struggle to fulfil my academic obligations of reflecting on the relevance of this research to academics and students.

Some of the most basic recommendations I can make from this work are simply reiterations of the messages of others. The title of Eber Hampton's lecture sums it up: "Research may improve if researchers remember their motives" (Hampton 1995). It is important to reflect upon and to communicate personal motives for research. Kovach asks readers to consider how personal meaning can be bound with community relevancy (2009). Carol Gear says that local advisors, preliminary learning, and community measures of success can help researchers keep on track towards community relevancy at all stages of a project. Finally, Kovach encourages us to find ways to connect personal motivation with community relevancy to create strong, meaningful and enduring research (2009).

I would also like to emphasise that engaging with Indigenous methodologies has the potential not just to develop critical insight into how Indigenous peoples negotiate respectful and healthy long-term relationships with plants and with place (Turner 2005), but it also has the potential to transform our very understanding of knowledge as

something that is made, or exists, through our relationships with others. In Indigenous worldviews, knowledge is never the product of a single individual's work; rather, "the insights rise up from the passion and toil of self-in-relation" (Kovach 2009, 129).

Without relationships with people and plants, there is no insight, and no academic recommendations to impart. The entirety of this dissertation, of all the insight and learning it is able to share, rests on Makkovimiut and plants and my relationships with them. So while we must fulfil academic obligations, philosophically and practically I believe that collective knowledge has obligations to the collective, and that community obligations must come first. Renee Pualani Louis describes the result of research that puts academic needs before the needs of Indigenous communities:

All around the world, Indigenous/Aboriginal/Native peoples are responding to Western researchers' needs to further develop Western scientific knowledge systems. Our voices may have started out as a low murmur from the margin but it has now become a distinct and unified cacophony of resistance and distrust. The doors previously open for doing research on an Indigenous community in the name of science are closing. And very soon, these doors will be shut for good (Louis 2007, 130).

Carol echoes this sentiment in her closing thoughts on why research needs to recognise and respond to the communities that sustain it:

People here are getting burned out. To what end? Eventually the only people left involved in research in communities will be the people who have to do it because it's part of their job. The most important part of research is the human part of it. That above everything else, and that goes for any researcher, instructor, or university. Human beings should be the priority. When you can continue your work, your wonderful large project, it's because you have people to talk to and welcome you back, because of the human relationships. There should be some kind of a mark in any research, for any researchers getting accredited, published or able to graduate on how well they have prioritised relationships" (Carol Gear 2016c).

Part and parcel of prioritising community obligations and working to strengthen research relationships is supporting and advocating for research that goes in service to community. I am grateful that academia can and does provide a place for scholars who believe “university ought to bring the best of human knowledge into dialogue so that we might better understand the universe” (Newhouse 2008, 189). If we want to ensure that the “best of human knowledge” includes Indigenous knowledge and ways of knowing, we must attend to what knowledge is and can be. Then we may begin to “experience the beauty of the whole picture” (Carol Gear 2015b).

3 Chapter: The stories people tell about plants: Makkovimiut plant knowledge in practice

3.1 Introduction

Labrador has been of great botanical interest to visitors for many centuries (Pringle 1992, Cayouette 2014). Only rarely, and rarely at length, have early authors commented upon the relationships between plants and the Indigenous peoples of Labrador (e.g. Hawkes 1916). The importance of plants to northern peoples has generally been overlooked by outside observers, frequently the result of observer bias (Dritsas 1986, Lepofsky et al. 2001). More recently, there has been a better appreciation for the practical, personal and social role of plants in the lives of northern peoples (Dritsas 1986, Burt 2001, Ootoova et al. 2001, Zutter 2009, Blondeau et al. 2010, Jones 2010, Ziegler et al. 2013). In Labrador, relationships between people and plants have been best chronicled by local peoples themselves through regional publications such as *Them Days Magazine*. Visiting researchers have also begun to work more closely with residents in learning about the living plant knowledge in Labrador communities (Inkpen 1999, Karst 2002, Clark 2012, Cuerrier and Hermanutz 2012, Cuerrier et al. 2012, Downing et al. 2013), and about how people shape landscape through their relationships with plants (Lemus-Lauzon et al. 2012).

Nunatsiavut (the Inuit Land Claims Area in Labrador; “Our Beautiful Land” in Inuttitut) is home to five of the southernmost Inuit communities in Canada: Nain, Hopedale, Postville, Makkovik, and Rigolet. Nunatsiavummiut (residents of Nunatsiavut) practice their plant knowledge at the northern boundary of the boreal forest, where the treeline joins an Arctic and maritime flora to create a unique suite of plant

species and a varied visual landscape. Each Nunatsiavut community is both ecologically and culturally unique, and has its own story to tell about relationships with plants.

In 2012, guided by Community Liaison Officer Carol Gear (Nunatsiavut Government, Makkovik), we began learning about research priorities in the Inuit Community of Makkovik on the topic of people-plant relationships. One of the most pressing research needs identified by Makkovimiut (residents of Makkovik) on this topic was documenting plant knowledge in Makkovik, particularly the knowledge of Elders (Appendices A-F). This chapter presents “The stories people tell about plants”, what Makkovimiut plant mentors have to say about the cultural importance of plants. In Part A, we focus on how plants support a web of interconnected cultural practices in Makkovik. In Part B, we look at how Makkovimiut shape landscape through plant practices. In Part C, we consider how practicing relationships with plants also supports and encourages cultural values.

“We” the authors write with a combined voice, though our roles in this work have been different from one another. Erica is a PhD candidate (Carleton University) who learns from plant mentors in Makkovik. Carol is the Community Liaison Officer in Makkovik (Nunatsiavut Government) and has advised this work since its beginning. Carol’s voice speaks in this manuscript through her direct quotations. Gita (Academic supervisor, Carleton University) and Jeremy Lundholm (Doctoral committee member, Saint Mary’s University) have advised Erica throughout this work and their experience and guidance inform the writing.

Many other people speak in this chapter: first and foremost, plant mentors in Makkovik. We do not claim that perspectives on plants are uniformly shared by all

Makkovimiut (Heikkilä and Fondahl 2012), and this is why the Inuit Community of Makkovik is not listed as an author. Nor do we wish to make Makkovimiut plant mentors anonymous with a generic or collective authorship. Plant mentors are named throughout this manuscript and acknowledged through citations as the people who collectively make this work possible.

3.2 How we learned

A detailed methodology for this work is described in Chapter 2, including reflections on the research process. Insofar as it is possible, the non-Indigenous authors in this chapter (Erica, Gita and Jeremy) have looked to Indigenous methodologies for guidance on building respectful research relationships throughout this project (Louis 2007, Wilson 2008, Kovach 2009), and have tried to work according to these principles as best we can. Carol's guidance of the work has supported a depth and richness of learning that would otherwise not be possible.

3.2.1 Who we worked with

Many Makkovimiut have a broad knowledge of plants, especially in relation to widespread practices such as berrypicking and wooding (wood harvesting). Some Makkovimiut also have a very specialised knowledge of specific plant practices: for example, turning snowshoes, making a smoke pot, smoking fish, and making spruce beer. We learned from thirty-four plant mentors in documenting cultural plant knowledge in Makkovik. Many of these mentors worked repeatedly with Erica over many visits and many hours to share their expertise. Significant time was spent learning from guides

Todd Broomfield and Sheldon Andersen, as well as historian Joan Andersen. Jessica Winters assisted with this work as a student research assistant, particularly in developing youth programming around cultural plants in her community. There are many reasons why Erica spent more time with some mentors than others, including the time available to mentors, the broad or specialised nature of their plant knowledge, their health, and weather conditions.

We appreciate that it is important to communicate some measure of the scope of the work to academic readers; however, we do so with some unease, for these measures do not necessarily denote reciprocity or success from a community's perspective. This chapter has evolved from 20 separate visits to Makkovik from 2012-2016 (Appendix Q). During these visits, plant mentors gave over 250 hours of their time to discussions and apprenticeships; guides spent an additional 40 days with Erica during planning and field work in plant ecology. Frequent visits are important in demonstrating basic respect for and interest in the knowledge of Elders, but a learner must also show active reciprocity in the community, in acknowledgement of the time Makkovimiut invest in them. In Makkovik, active reciprocity meant working to fulfil plant-related community research priorities shared during preliminary research (Appendices A-F), and being active in daily life in Makkovik. Erica regularly presented learning updates and slide shows at Elders' dinners, community hall presentations, festival events, and on radio; communicated project news through mailed and online newsletters; developed and organised plant skill workshops; with Jessica, held regular children's events to connect youth with plants and with Elders; and contributed plant foods and posters to cultural suppers. There were many ways to contribute to life in Makkovik beyond plant-related topics, and these included

developing a Makkovimiut sewing and craftwork exhibition for an international conference, including artist biographies; helping with and participating in festival events; baking for fundraisers; writing songs for Jamboree; playing in badminton tournaments; judging sled dog races; attending Junior Canadian Rangers shooting practice; and gardening with Elders, among other things.

3.2.2 Talking and doing

Discussions about plants took place in Makkovik and at family places near to town, where many Makkovimiut have cabins at the sites of former seasonal family homes. We talked about plants one-on-one or in small groups at family homes, or in larger groups at the community hall and craft centre (Wilson 2001). Discussions were semi-structured at the beginning of the project, but moved to open-structured conversations as relationships became more established (Wilson 2008, Kovach 2009). Photos were sometimes used to complement these discussions, and at one community hall event plant photos were used to check if we had missed any plants in our collective discussions (Harper 2002).

We talked about plants on walks outdoors in Makkovik, in gardens, and at family cabins (Hitchings and Jones 2004, Anderson 2005). We also tried to learn by doing, through apprenticing with mentors around specific plant skills. Some of these apprenticeships took place over many visits, like turning a pair of snowshoes with Mr. Henry Jacque. Other apprenticeships were done in small groups, like making a smoke pot with Aunt Annie Evans. Community workshops were events during which we learned plant practices as a group, such as dye-making with Aunt Nellie Winters, and container gardening with Marilyn Faulkner. Phone calls and emails were ways to speak directly

with Makkovimiut about plants while Erica was at home in Goose Bay. Learning also occurred while travelling by boat and snowmobile with guides and other Makkovimiut plant mentors.

3.2.3 Documenting, checking, making meaning

Some discussions were taped on an audio recorder, and transcribed verbatim by Erica (Kovach 2009). Notes were also taken by hand during discussions and apprenticeships, or written from memory after discussions and activities were finished. Photos were used to document steps in working with plants during apprenticeships, such as turning snowshoes. All audio transcripts and notes were returned in draft to plant mentors and reviewed together with Erica for accuracy, and for potentially sensitive material. These notes from previous discussions often helped mentors expand on previously discussed subjects, or spark new or related topics of discussion. In this way, draft transcripts and notes functioned as story-elicitation. With the frequency of visits and the iterative process of discussion-review-discussion, the typically separate stages of discussion and verification occurred simultaneously during this project. An advantage of an ongoing discussion-verification process was that it allowed mentors to fine-tune their consent, and to decide on a line-by-line basis what they would like to make publicly accessible. When plant mentors were satisfied with a transcript or set of notes, a “final” version was considered ready to place in the community archives in the White Elephant Museum in Makkovik.

Plant knowledge in Makkovik is generally discussed in the context of active practices and values relating to plants. We kept a running list of the practices and values

that emerged from discussions, which then became the thematic groupings around which to organise stories about plants, as well as a way to organise this chapter (Kovach 2006). The relevancy of these headings and their related content was evaluated with plant mentors through one-on-one discussions, a community workshop and two presentations, which generated suggestions about overlooked themes and content. Erica used NVivo 10 to organise transcripts and notes into these revised thematic groupings, and this has provided the analytical framework for discussing collective Makkovimiut plant knowledge (Appendix V) .

3.2.4 Representing and sharing Makkovimiut plant knowledge

Working with Makkovimiut plant mentors has been what Jonaki Bhattacharyya describes as exploratory research (Bhattacharyya 2012). Exploratory research is appropriate in situations with complex connections between interrelated systems, both cultural and ecological, and for instances in which “published research is scarce and local knowledge is rich” (Bhattacharyya 2012, 48). The richness of Makkovimiut relationships with plants is evident in the first-person stories throughout this chapter, which describe the extended web of relationships between people, plants, cultural practices, family, community, and values. Stories are a central part of methodologies that emphasise knowledge in context (Kovach 2009), and they are profoundly important in Indigenous methodologies.

Margaret Kovach writes that viewing story as research depends on one’s definition of research:

Is research a form of knowledge-seeking that is amenable only to quantifiable generalizations? If that is the belief, it shuts out the possibility of Indigenous research frameworks where generalizabilities are inconsistent with the epistemic

foundation. If research is about learning, so as to enhance the well-being of the earth's inhabitants, then story is research" (Kovach 2009, 102).

The stories in this work have been told in support of a community research priority, which is one of the central objectives of this work: documenting cultural plant knowledge in Makkovik, so as to bring together in one place the collective plant knowledge of Makkovimiut. The stories Makkovimiut tell about plants are (mostly) told one at a time, one voice at a time. The stories may be individual, but they are collectively familiar, and they inform and enrich one another as they build towards a collective and interrelated knowledge. In this way, stories about plants are shared stories. An example of these shared stories is found in the story of plants and fishing in section 3.2.2. Shared stories have more to tell us about the importance of plants and relationships with plants than can be understood by a single story, or a part of a single story. The value is in the whole narrative, not in individual lines.

The goal of this research is to bring together a community knowledge, to build synthesis - not to break it apart. This is why readers will not find analyses according to individual categories: which plants are food, which plants are medicine. These categories are easily transcended in stories about plants. When plants are food, and food is medicine (Carol Gear 2015a), categories separating food plants and medicine plants begin to dissolve. People, like plants, are also not assigned to categories like age or gender, and Makkovimiut knowledge is not discussed through these lenses. I (Erica) have worked closely with Makkovimiut plant mentors. I have relationships with them, as a learner to mentors, and through friendship and family. The honorifics "Aunt" and "Uncle" are used throughout this work as they are in day-to-day life to

denote love and respect. Speaking of Makkovimiut in categories, in generalities, breaks down these relationships. It is incompatible with an Indigenous methodologies approach to research. The goal of research is to deepen relationships (Wilson 2008, Bawaka Country et al. 2015), and this is done by enriching a narrative, not mining it.

Makkovimiut plant knowledge is not new knowledge – after all, it lives in the relationships of every Makkovimiut to the plants of their community. What is new in this research, and what makes it valuable, is documenting individual relationships with plants and weaving these stories together to share a collectively richer narrative. In the following sections, it is these shared stories brought together that collectively make meaning of the relationships between Makkovimiut and plants.

3.3 What we learned, PART A – How plants shape life in Makkovik

3.3.1 Overview

In this project, Makkovimiut plant mentors collectively spoke about 65 native and naturalised plants (Table 1). The majority of these plants are herbs (32 species), followed by shrubs and trees (21), grasses and sedges (3), and mosses and lichens (2). Five species are introduced species that have become naturalised and widespread, such as rhubarb (*Rheum* spp.), chives (*Allium schoenoprasum*), and larkspur (*Delphinium* sp.). Mushrooms (mostly *Boletus* spp.) and marine plant species are also listed in Table 1, as well as four garden species (arnica, chamomile, lupines, and marigolds) that feature prominently in stories by plant mentors. Not all plants mentioned by Makkovimiut are discussed in this chapter or are represented in Table 1. For example, imported plants are sometimes mentioned in stories, especially those told by Elders, including plants such as

tea, tobacco, pepper, and oranges. Vegetable and flower gardens are popular in Makkovik, as are houseplants. As this chapter focuses more on relationships with native and naturalised plants, these imported plants, garden plants, and houseplants will not be discussed at length in this dissertation.

Mentors sometimes speak of plants in broad terms beyond Linnaean taxonomy; for instance, rotten wood and driftwood, trees, berries, or mushrooms, generally. Conversely, single species in Linnaean taxonomy are split into several distinct plants. What western taxonomists describe as white spruce (*Picea alba*) is split into two species, white spruce and blue spruce (John Winters 2014a). Plants are sometimes also distinguished by gender. Balsam fir (*Abies balsamea*), known in Makkovik as vir, can be a “she vir” or a “he vir”, with the “she vir” showing more lush needle growth (Aunt Nellie Winters 2013c). A “she vir” is preferred as a Christmas tree: “You know there’s a she vir and a he vir? If you cut a she tree, she’s freshest. She won’t dry out like the other one. You don’t even have to put water in. But if you put a he one up you, can take it down again New Year’s. It dries out so quick” (Aunt Nellie Winters 2014b).

Most plants are referred to by their local English names, which we share in Table 1 and use throughout this chapter. The local English names used in Makkovik are quite regionally-specific, and differ from common English names used elsewhere in the province or in Canada. For example, the berries known as redberries (kimminak, *Vaccinium vitis-idaea*) in Makkovik are called partridgeberries in Newfoundland, cranberry in other parts of the North, and lingonberry in Europe. A few plants and their edible parts are commonly referred to by their Inuttitut names in Makkovik, especially tulligunnak (*Rhodiola rosea*), uKaujak (willow buds, *Salix* spp.), and kutsuk (spruce

gum, *Picea* spp.). In fact, we are not aware of any other name for tulligunnak in Makkovik other than its Inuttitut name. Items made of wood such as komatik (sled) and killik (anchor) are also referred to by their Inuttitut names in lieu of English ones.

Table 1 Plants discussed by Makkovimiut plant mentors

Sixty-five native and naturalised plant species discussed by Makkovimiut plant mentors, plus four annual garden species. Species are listed alphabetically by genus and species. Also included are taxonomic family, local names specific to Makkovik, Inuttitut names, and other common names. Inuttitut names provided by Makkovimiut are indicated by an asterisk. All other Inuttitut plant names are compiled from other publications on Labrador plants: Peacock (1974), Ilisannimut Aulatsijet Labradorimi/Labrador School Board (2005), Cuerrier and Hermanutz (2012), Downing et al. (2013), and Pigott (n.d). Pronunciation of capital “K” in Inuttitut is similar to the “ch” in loch. Scientific names are from the Integrated Taxonomic Information System (ITIS) (2016). Other common names are from regional field guides (Ryan 1995, Scott and Black 2008, Scott 2010), the Digital Flora of Newfoundland and Labrador (2015), and NatureServe (2015).

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Abies balsamea</i>	Pinaceae	vir, fir	Killagittuk, Killagutik	balsam fir, fir, silver pine
<i>Allium schoenoprasum</i>	Liliaceae	chives	Kianatuk* (this means onion; Aunt Nellie Winters 2016); KeanartoK (chives; from Peacock 1974)	chives, wild chives
<i>Alnus viridis</i>	Betulaceae	alder, willows	Uppigak, oKaujavalât	green alder
<i>Amelanchier bartramiana</i>	Rosaceae	Indian plum, plum willow, plum tree		chuckley pear, chuckleberry, mountain serviceberry, Bartram’s shadbush

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Angelica atropurpurea</i>	Apiaceae	hemlock, poison hemlock, umbehlock	sinatuvak*, nullaijaijongojartoK ("rhubarb and Angelica"; Peacock 1974); nuliajoK (hemlock; Peacock 1974)	great angelica, purplestem angelica, alexanders
<i>Arctous alpina</i>	Ericaceae	foxberry		alpine bearberry
<i>Arnica</i> sp.	Asteraceae	arnica		narrowleaf arnica; mountain arnica
<i>Astragalus alpinus</i>	Fabaceae	Jacob's ladder		alpine milkvetch
<i>Betula papyrifera</i>	Betulaceae	birch	Kairoluk*, Kaigulek	paper birch
<i>Boletus</i> spp. (and other genera)	Boletaceae	mushroom		
<i>Calamagrostis canadensis</i> ; also other grasses	Poaceae	grass, Labrador grass	ivisugak*, ivik	Canada bluejoint, bluejoint reedgrass
<i>Campanula uniflora</i>	Campanulaceae	bluebells	tikkinguat*	Arctic harebell, harebell
<i>Chamerion angustifolium</i>	Onagraceae	bumblebee flower	paunnaluk	fireweed, rosebay willowherb

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Cladonia</i> spp.	Cladoniaceae	moss, caribou moss	niKâk, niggagasak (translates as “food for animals”; Aunt Nellie Winters 2016), niKâgasik (<i>Cladonia rangiferina</i>), assut (<i>C. rangiferina</i>)	caribou moss
<i>Comarum palustre</i>	Rosaceae	Labrador rose		marsh cinquefoil
<i>Cornus suecica</i> , <i>C. canadensis</i>	Cornaceae	crackerberry	sigalak	bunchberry, generally; bunchberry (<i>Cornus canadensis</i>); Swedish bunchberry, Swedish cornel (<i>Cornus suecica</i>)
<i>Delphinium</i> sp.	Ranunculaceae	larkspurs, delphinium		delphinium, larkspur
<i>Dicranum</i> spp.; <i>Polytrichum</i> spp.; <i>Racomitrium</i> spp.; <i>Sphagnum</i> spp.	Dicranaceae; Polytrichaceae; Grimmiaceae; Sphagnaceae	moss, green moss	iKattaittuk, niKâk, utjuk (means to remove fur from sealskin lines by soaking it in green moss; Aunt Nellie Winters 2016)	fork moss (<i>Dicranum</i>); haircap moss, hair moss (<i>Polytrichum</i>); woolly moss (<i>Racomitrium</i>); peat moss (<i>Sphagnum</i>)
<i>Empetrum nigrum</i>	Ericaceae	blackberry	paunngak*, paungak	black crowberry, crowberry
<i>Eriophorum</i> spp.	Cyperaceae	cotton grass, Arctic cotton, cotton balls	suputaujak, supatik, ivitsukak tuttuk, pualujak	cottongrass

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Gaultheria hispidula</i>	Ericaceae	snowberry, menya berry		creeping snowberry, maidenhair, magna-tea berry, Indian tea berry
<i>Geocaulon lividum</i>	Santalaceae	deadly nightshade		northern comandra
<i>Iris setosa</i>	Iridaceae	iris		beach-head iris
<i>Juniperus communis</i>	Cupressaceae	juniper, ground juniper	Kisiktutaujak	common juniper
<i>Kalmia polifolia</i>	Ericaceae			bog laurel
<i>Laminaria</i> spp.; <i>Dictyosiphon</i> spp.; <i>Ascophyllum nodosum</i> ; <i>Fucus</i> spp.; <i>Fucus edentatus</i> ; <i>Fucus vesiculosus</i> ; <i>Pilayella</i> spp. (from Downing et al. 2013)	Laminariaceae; Chordariaceae; Fucaceae; Acinetosporaceae	kellup, seaweed	KikKuak, kuannik*, kuannik itlujak, Kukkianguakkuluk/Kukkiangg uakuluk, nujaujak	kelp, seaweed, shark's blanket
<i>Larix laricina</i>	Pinaceae	juniper, juniper tree	pingingak*, pingek, pingik	larch, tamarack

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Lathyrus japonicus</i>	Fabaceae	beach peas, saltwater peas, green peas, wild peas, sweet peas, peas		sea pea, sea vetchling
<i>Leymus mollis</i>	Poaceae	grass, saltwater grass	ivik*, ivitsukak (this means land grass; Aunt Nellie Winters 2016), senngailik	dune grass, American dune grass, strand wheat
<i>Ligusticum scoticum</i>	Apiaceae	Alexanders		Scots lovage, Scotch lovage
<i>Linnaea borealis</i>	Caprifoliaceae	twinflor, twin- bell flower		twinflor
<i>Lupinus polyphyllus</i>	Fabaceae	lupines		lupines
<i>Matricaria chamomilla</i>	Asteraceae	chamomile		German chamomile
<i>Mentha arvensis</i>	Lamiaceae	mint, mints		mint, wild mint
<i>Menyanthes trifoliata</i>	Menyanthaceae	lilies, water lilies, lilypads		bogbean, buckbean
<i>Moneses uniflora</i>	Ericaceae	one-flowered wintergreen		one-flowered wintergreen
<i>Oclemena nemoralis</i>	Asteraceae	bog aster, aster		bog aster, wood aster

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Oxyria digyna</i>	Polygonaceae	tiny rhubarbs	Kungulik, sennalukkuluk	mountain sorrel
<i>Papaver nudicaule</i> ; <i>Papaver labradoricum</i>	Papaveraceae	poppy, poppies		Iceland poppy; Labrador poppy
<i>Pedicularis groenlandica</i>	Orobanchaceae	elephant's head		elephant's head, elephanthead lousewort
<i>Pedicularis labradorica</i> (?); <i>Pedicularis flammea</i> (?); <i>Oxytropis campestris</i> (?); <i>Bistorta vivipara</i> (?)	Orobanchaceae; Orobanchaceae Fabaceae; Polygonaceae	Eskimo potato, Inuit potato, bear root	nakatannaujak; sapangalalannguak(?) (<i>Bistorta vivipara</i>) (Pigott n.d)	Inuit turnip, Labrador lousewort (<i>Pedicularis labradorica</i>); Inuit turnip, redtip lousewort (<i>Pedicularis flammea</i>); Inuit turnip, field oxytrope (<i>Oxytropis campestris</i>); alpine bistort (<i>Bistorta vivipara</i>)
<i>Picea glauca</i>	Pinaceae	blue spruce		?
<i>Picea glauca</i>	Pinaceae	white spruce, spruce	napâttuk*/napattuk ("ordinary tree"), napâttutuinnak ("ordinary tree"/white spruce), Kautsikutit (black spruce), napattuk Kinnitak (black spruce) (Downing et al. 2013)	white spruce

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Picea mariana</i>	Pinaceae	black spruce, spruce	napâttuk*/napattuk (“ordinary tree”), napâttutuinnak (“ordinary tree”/white spruce), Kautsikutit (black spruce), napattuk Kinnitak (black spruce) (from Downing et al. 2013)	black spruce
<i>Pinus banksiana</i>	Pinaceae	jack pine		jack pine
<i>Populus tremuloides</i>	Salicaceae	poplar, popular		trembling aspen, white poplar
<i>Potentilla anserina</i>	Rosaceae	buttercup		silverweed
<i>Ranunculus</i> sp.	Ranunculaceae	buttercup		buttercup
<i>Rheum</i> spp.	Polygonaceae	rhubarbs, rhubarb	sinatuvak*, sinatuk* (one rhubarb; Aunt Nellie Winters 2016), sennâluk (a rhubarb patch; Aunt Nellie Winters 2016), sênartok, sênâluk; nullaijaijongojartoK (“rhubarb and Angelica”; Peacock1974)	rhubarb
<i>Rhodiola rosea</i>	Crassulaceae	tulligunnak (many pronunciations: e.g. who-le-vee-nuk)	tulligunnak*, utsuKammak (root; Downing et al. 2013)	roseroot

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Rhododendron groenlandicum</i>	Ericaceae	Indian tea, Labrador tea	mamaittuKutik*, mamaittuKotet (this means “not good to pick”; Aunt Nellie Winters 2016), mammaitoKut (“wild rosemary”; Peacock 1974)	Labrador tea
<i>Ribes glandulosum</i>	Grossulariaceae	currants	kimminaujak*, mikKulik, mikkulik, kimminaujaKutik (plant; Downing et al. 2013), ummilikkuluk, ummilikuluk, kingminaujat	skunk currant
<i>Rubus arcticus</i>	Rosaceae	strawberries	appiujak* (plant/berry), appiujaKutik (plant) (Downing et. al 2013)	plumboy, Arctic raspberry, Arctic bramble
<i>Rubus chamaemorus</i>	Rosaceae	bakeapple, appik	appik* (plant/berry), aunik (ripe berry), appiKutik (plant/leaves) (Downing et al. 2013); appiKutik (Bakeapple plant before the fruit is formed); appitsak (Bakeapple plant in spring before they turn red) (Pigott n.d.)	cloudberry

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Rubus idaeus</i>	Rosaceae	raspberry	ukpigaK kakkilautelik (bramble; Peacock 1974)	raspberry
<i>Rubus pubescens</i>	Rosaceae	hairy plumboy		hairy plumboy
<i>Rumex crispus</i>	Polygonaceae	German rhubarbs		curly dock
<i>Salix</i> spp.	Salicaceae	willows, uKaujak (just the early leaves); pussy willow; dogberry willow (tall willows with a gall)	uppigak*, uKaujak* (this is only the early leaves); small or dwarf species of willow are called addel (Aunt Nellie Winters 2016)	willow (many species)
<i>Senecio pseudoarnica</i>	Asteraceae	saltwater flowers, saltwater sunflowers		arnica ragwort, seaside ragwort, seabeach groundsel
<i>Sorbus decora</i>	Rosaceae	dogberry, dogberry tree	Kairoluujak (dogwood tree; Peacock 1974)	northern mountain ash
<i>Streptopus amplexifolius</i>	Liliaceae	twisted stalk		clasping twisted-stalk, claspleaf twistedstalk
<i>Tagetes</i> spp.	Asteraceae	marigold		marigold

Scientific name	Linnaean family	Local name in Makkovik	Inuttitut name	Other common names
<i>Taraxacum</i> spp.	Asteraceae	dandelion, piss-a-beds	misattak	dandelions, pis-en-lit
<i>Vaccinium boreale</i>	Ericaceae	groundharts, blueberries		boreal blueberry, sweet hurts, ground hurts
<i>Vaccinium caespitosum</i>	Ericaceae	blueberries	kigutanginnak*, paungajuk (this means raisins; Aunt Nellie Winters 2016), pungngajuk, pungajok kigutanginnakuluk	dwarf bilberry
<i>Vaccinium oxycoccos</i>	Ericaceae	marshberry	kimminaujak; this also means currants (Aunt Nellie Winters 2016)	small cranberry
<i>Vaccinium uliginosum</i>	Ericaceae	backieberries, blueberries	kigutanginnak*, kigutanginnakuluk, kigutanginnaKutik/ kigutanginnaKautik	blueberry, alpine bilberry
<i>Vaccinium vitis-idaea</i>	Ericaceae	redberries	kimminak* (berry), kimminaKutik (plant), kimminait/kimminatsait (many) (Downing et al. 2013)	partridgeberry, cranberry, lingonberry, mountain cranberry
<i>Viburnum edule</i>	Adoxaceae	squashberry		mooseberry

For reasons of length, it's not possible to include all the stories from Makkovimiut plant mentors that speak to relationships with each of the plants in Table 1. Instead, we will focus on a single species—blackberry (*Empetrum nigrum*)—to illustrate the diverse ways that a single plant is important to life in Makkovik. Blackberries are one of the most abundant species in and around Makkovik. Although other berries are collected in greater quantities, such as redberries, blackberries are highly connected to diverse cultural practices in Makkovik. Not just the berry but the entire plant, even its scent, is important. The name “blackberry” is even used to describe a pteropod (sea snail) that is food for codfish at a certain time of year (Todd Broomfield 2015a). In Table 2, Makkovimiut speak about the way in which relationships with blackberries are expressed in day-to-day practices. We focus on practices with blackberries, rather than blackberries as belonging to categories such as food or materials. Clearly, blackberries are food, just as they are materials. Focusing on practice helps us understand that a wide range of skills and knowledge support blackberries as “food”, such as cleaning, storing, cooking, and knowing where to find the best blackberries. It also reminds us that cultural knowledge is not static or compartmentalised in the way of defined categories. It is living and active in practiced relationships with plants. Table 2 gives examples of blackberries in relation to such practices as eating, cleaning, storing, dyeing, painting, smoking fish, making a smoke pot, building, hunting, interpreting habitat effects, naming, being outside, healing and relaxing, valuing harvesting areas, and showing respect. For each practice, we share a single quotation from individual Makkovimiut plant mentors to help present personal perspectives on blackberries, and provide overview summaries of each practice in italicised content to give broader community context.

Table 2 Relationships with blackberry (*Empetrum nigrum*) in Makkovik

Plant practice	Description	Plant mentor
Eating		
<i>Blackberries are some of the most abundant berries in Makkovik. They are eaten fresh from the plant as a snack. Some people suck the juice from them while out hunting instead of carrying a water bottle. There are recipes for blackberry pork cake, blackberry syrup, and blackberry pancakes.</i>	“We had them in cakes and puddings, and blackberry jam. And you thicken the blackberry jam cause it’s all juice, eh, just juice and seeds is what it is, but you thicken it with a little bit of flour. Mummy used to make blackberry jam. And you eat them like that. And siva? The cod livers? You get the cod livers, and you squeeze them up and then fry them, and when you’re frying it you stir it and stir it, and then you like put the pot up on something and dip the oil off, and then you would stir it, cook it again until it gets brown. It’s siva. And people eats a lot of the blackberries and siva, mixed together.”	Aunt Annie Evans (2013a)
Cleaning		
<i>Many Makkovimiut try to “pick clean”, or pick berries with as few leaves and twigs as possible. Berries are usually cleaned immediately after picking to ensure they do not go to waste. Blackberries can be cleaned by hand, by floating them in water, or with wind.</i>	From notes: Aunt Annie’s husband (Mr. Rupert Evans) would clean the berries, redberries and blackberries. He would stand on a step at Ben’s Cove when there was a wind and pour them slowly from a board into another container, or from one container into another, over and over again, and let the wind blow away the leaves that were trapped in the berries.	Aunt Annie Evans (2013b)

Storing		
<i>It was not unusual for families to pick fifty gallons of a single berry species every year. Today, most berries are stored in plastic bags or containers in freezers. Previously, blackberries were bottled, or stored in large wooden barrels kept outside in winter. This works for any frozen vegetable so long as it is thawed in a bowl of cold water (Aunt Nellie Winters 2013a)</i>	“When I was in the boarding school in Nain they used to have blackberries for supper sometimes, frozen in barrels, keep frozen. Used to be pretty good... You keep them froze and they’re ok. If they get mild then they grow soft, you know. Long as they keep frozen. We used to take them out to Grandfather’s really frozen. And then we’d put in barrels and keep ‘em froze, and you put it in water when you thaw it out, the ice comes out. If you just put it in the bowl around the counter, let it thaw out, it just get mushy.”	Aunt Nellie Winters (2013a)
Dyeing		
<i>Blackberries make a potent and colour-fast purple dye. They are used as dye for furniture, clothing and sewing, craftwork, and in baking.</i>	“They’re good for dyeing grasswork too. Mother used to dye with redberries and blackberries. She’d just squeeze all the juice out of them and put the grass to soaking overnight to make a purplish colour. Just for the fancy marks in them.”	Aunt Nellie Winters (2014b)
Painting		
<i>Blackberry dye is ideal for children’s crafts and artwork as it readily available and non-toxic. Berries are mashed and the juice is strained to produce liquid for painting.</i>	“I’ve been using leaves and that, rub some blackberry juice or redberry juice on paper, just teaching my grandkids to do stuff. And they put this leaf in it, and then they put it on the white paper, to make fancy things. You even use a paintbrush if you wants, stick it in the berry juice, you know, and make pretty flowers... A small brush is really good to put on the blackberries.”	Aunt Nellie Winters (2013a)

Smoking fish		
<i>In July and August, blackberry bushes and their peat (the het or sod) is used as fuel for smoking trout in smokehouses. As it smokes, the berry het preserves and adds flavour to the trout.</i>	“Rotten wood is really good. You puts the berry het [blackberry sod], you starts the fire, and you puts the berry het over it, and then you puts the rotten wood on top of that. That could be damp wood, rotten. And then you puts the sod on top. That’s the way we used to do it... The smell from the berry het and the rotten wood makes real good smoke.”	Aunt Nellie Winters (2013b)
Making a smoke pot		
<i>Similarly to its use in a smokehouse, blackberry sod is also set afire in pans or old buckets to create smoke, which helps to keep blackflies and mosquitos at bay while people are working outside. Smokepots were often kept outside where people were working with fish, or carried through the house to smoke out flies before bed.</i>	“When the mixing pan got a hole in it, and you had to get another one, you use it for the smokepot. And you would put like sod off the top in the bottom, and then put the berry leaves in, and get it smoking good and put a piece of sod on top. And my Mom used to smoke out the rooms, the bedrooms and the house at the night before we go in and go to bed. And then you put it out by the door and it kept the flies away. And down on the stage head where they were working with the fish, they would have one going too, to keep the flies away.”	Aunt Annie Evans (2013c)

Building		
<i>Blackberry sod (peat), also known as blackberry het, can be cut into rectangles with a shovel. This cut-out blackberry sod was placed on top of houses as a living roof. It was also used on the roofs of fishing stages to keep fish cool, and as insulation in the walls of winter homes, such as the Evans' house at Ben's Cove, which was considered an exceptionally warm house. Cold storage cellars were built into the side of hills by removing the blackberry sod, inserting storage boxes, and replacing the sod on top.</i>	From notes: The stages at the fishing places had sod roofs. They didn't get hot inside when they had the sod on top. They were insulated. That was where they salted and stored the cod in there. The sod was flat down on the roof, on top of boards that were close together. You would get ventilation from the door and windows: "When it was a real hot day, we would play in there, and on rainy days. They put sod on to keep it cool and so it wouldn't leak. And there were flowers growing on the roof. If it was cold outside, or foggy, then it was warmer inside the stage, like in the fall. That was down to Strawberry. That was the last place I saw it, down there. I was eight or ten. Other people had felt to put on their sheds. Maybe we only had the sod."	Aunt Annie Evans (2015b)
Hunting		
<i>Blackberries are very important as food for animals. Makkovimiut can predict how long the geese will stay around in the fall by the abundance of blackberries. Geese eat so many blackberries that you have to clean a harvested goose right away or the taste of the blackberry goes right through them.</i>	From notes: If you're looking for partridge, then look for blackberries, especially in October – people in Makkovik start to hunt partridge in October. Partridge crops are full of blackberries at that time. When the snow comes, partridge turn to spruce as their food. Todd likes tasting the spruce on the partridge. Spruce partridge don't taste good when they're eating blackberries. Geese like to eat blackberries.	Todd Broomfield (2014b, 2015a)

Interpreting habitat effects		
<i>The taste and size of blackberries is affected by habitat and growing conditions</i>	“(Blackberries) grow better and they taste better by the saltwater. They’re sweeter. They grows bigger by the saltwater, too.”	Aunt Annie Evans (2014c)
Naming		
<i>Early in the season, codfish feed on a pteropod that is said to look like a blackberry with wings. Makkovimiut call these pteropods “blackberries”. When codfish are feeding on “blackberries”, they give a bad taste to all parts of the fish.</i>	From notes: When codfish are eating blackberries, you can taste the blackberry right through them, even in their tongue. The taste of the blackberry didn’t matter so much when you were salting codfish, but you can taste it when they’re eaten fresh. That’s why people fish for cod later now, to avoid the codfish when they’re feeding on blackberries. People try to stay away from the blackberry fish.	Todd Broomfield (2015a)

Being outside		
<i>Berries are critically important for nutrition in Makkovik. Berry picking as a practice is something that many people love because it is a time to spend time outdoors with their families, in places that are meaningful to them. Many Makkovimiut talk about the importance of berry picking for physical activity and health, as a time to appreciate the land, and as an opportunity for Elders to do something they love.</i>	<p>Uncle Harold: “Good. There’s a lot of berries, eh. There’s a good bunch of black ones there, look.”</p> <p>Aunt Ellen: “Oh yes, I’ll pick a few more of them when I’ve had my tea.”</p> <p>Uncle Harold: “Blueberries there, or what?”</p> <p>Erica: “Yeah, all the squished ones that I’ve just sat on over there. I’ve got blackberry knees. I’ve got my blackberry dye. I’m sure I’m going to have a few more on my bum when we stand up.”</p> <p>Aunt Ellen: “Yes, that’s alright. We don’t mind that. As long as we’re out. We can always clean when we get back home.”</p>	Aunt Ellen and Uncle Harold Andersen (2013b)
Healing and relaxing		
<i>Blackberries are used as both fuel and flavour in the smokehouse. The bushes have a distinctive scent that carries over land and water, that rises up from the land in the heat of the sun. The scent of blackberries is part of the experience of being outside in Makkovik, and being on the land. Some Makkovimiut describe it as important for well-being.</i>	<p>“Imagine you are sitting on an island, south of Makkovik. It's a beautiful sunny day in July. You are sitting on berry bushes, and there are blue, black and red berries as far as the eye can see. They are very soft, warm and fragrant. Seagulls are flying overhead. The water is calm and pristine, but there is a gentle breeze. You can feel the warm sun on your skin, but it's not hot, it's very relaxing. Close your eyes and take a deep breath. Can you smell the berry leaves? I can. Even though I have not touched a plant, I am now calm and relaxed.”</p>	Carol Gear (2015b)

Valuing harvesting areas		
<i>Blackberries are an abundant regional berry crop, but Makkovimiut speak of the increasing difficulty in accessing suitable berry patches within walking distance of Makkovik. Berry picking spots are often recognised as informally belonging to particular Elders, and these patches are called “gardens”. “Garden” does not imply any kind of cultivation.</i>	“You know, I know when they did the new subdivision road over there the other year and they had to blast a whole lot of stone away, one lady in particular stuck out in my mind. She said, ‘Oh, that’s my blackberry patch is going to be gone.’ Right? Cause that was a concern to her, because that was her garden. Every year that’s where she went to get her blackberries. You know, so now, like, you got to find other places to go in order to do that. So, I don’t know if that, I guess like in... progress is always a good thing, but like to a limit?”	Carol Gear (2013a)
Showing respect		
<i>Wasting berries is almost unheard of in Makkovik. Not only is it hard work to pick, clean, and store them, but it is disrespectful to the berries if they go to waste. Waste is very much discouraged.</i>	“You don’t ever see berries dumped out or anything. And if you did, like I did have some berries I had more than a year. I put them out where the flowers are. My sister-in-law Gladys told me that. Especially blackberries, put it out and it’ll just go into the ground and help the plants, eh.”	Aunt Annie Evans (2014b)

Aunt Nellie Winters has drawn some of the ways that blackberries are important to Makkovimiut, as described in Table 2. Her drawings appear in Figure 4 on the following page. Below is the description for this figure.

Figure 4 Relationships with blackberries – drawings by Aunt Nellie Winters

Inukuluk (“little people”) pen drawings by Aunt Nellie Winters depicting some of the relationships Makkovimiut have with blackberries (*Empetrum nigrum*). With permission from the artist, drawings have been superimposed on a photo from Long Tickle, taken by Erica Oberndorfer. Clockwise from bottom left: picking blackberries to eat, alongside a partridge (ptarmigan) who is also eating berries; dyeing saltwater grass (*Leymus mollis*) with blackberry juice for grass sewing; roofing a fishing stage with blackberry sod, and storing blackberries outside in a barrel (kept frozen for storage); smoking fish with blackberry sod, with pitsik (dried fish) hanging from the smokehouse; cleaning blackberries by tossing them in a wind and letting the leaves blow away; keeping a smokepot going with blackberry sod to keep away the flies; making siva, cooked cod livers, with blackberries. Drawings created by Aunt Nellie Winters 3 February 2016.

3.3.2 Plants in practice

Plants are often categorised according to their utility as food, medicine or materials (Brand-Miller and Holt 1996, Bussmann 2006, Fediuk et al. 2002, Black et al. 2008, Lipski 2010, Uprety et al. 2012). In Makkovik, it is more common to hear about plants in practice, in the context of day-to-day life, rather than as a list of edible, medicinal, or material plants. This active knowledge is reflected in other Indigenous traditions in which “knowledge that is practiced is knowledge” (Meyer 2001, 196). In Makkovik, these practices are often deeply embedded in a web of interconnected relationships. Perhaps this is one reason that the importance of people-plant relationships in the North has been undervalued by non-residents: plants are often inconspicuous in the ways they make other cultural practices possible.

Take fishing, as an example. How does fishing depend on plants? As a visitor, you may only see the fish being hauled into the boat. If you’re Makkovimiut, you understand through practice how connected plants are to every part of fishing. The juniper (*Larix laricina*) makes the snowshoes (Henry Jacque 2014a), so you can cut the spruce (*Picea* spp.) that builds the boat and pick the kutsuk (spruce gum) that seals the seams (John Winters 2014a). The juniper makes the killik (anchor) that holds you in place, and the juniper rind barks (dyes) the nets that haul the fish (John Winters 2014a). The kellup (seaweed, kelp, *Laminaria* group) you’ve picked from the nets cools the fish in the pail (Aunt Annie Evans 2015c). Ashore, the blackberry het (*Empetrum nigrum* sod) smoulders in the smokepot to keep away flies while you work, and you hang fish on the net gallet to make pitsik (dried fish) (Aunt Annie Evans 2013a, 2015b). If there’s yet snow on the high hills you can store fish fresh for the summertime under salt, snow, and

boughs (Aunt Nellie Winters 2013a), or in the “cold storage” of a rock crevice hard-packed with snow and ice that never thaws out, even in summer (Toby Andersen 2015). As the smokehouse puffs the trout full of flavour from the blackberry sod (Randy Edmunds 2013a), you might pick a few currants (*Ribes glandulosum*) by the cabin where they grow best (Aunt Annie Evans 2012), and mend the nets with the spruce netting needle (Charles McNeill and Jim McNeill 2013). The gulls eat the scraps and fertilise the land (Jessica Winters 2014) as you sit in the shade of the fishing stage with its blackberry sod and bark rind roof (*Larix laricina*) (Aunt Annie Evans 2015b, Toby Andersen 2015), rub tulligunnak (*Rhodiola rosea*) leaves on your sore hands (Henry Jacque 2014c), and remember to take a branch of fir (*Abies balsamea*) to scent the house with something other than fish (Carol Gear 2013a).

You can unravel each practice further and talk about the spruce that would fuel the steambox to bend the snowshoe bows (Henry Jacque 2014b); before snowmobiles, the caribou moss (*Cladonia* spp.) and seal fat that nourished your dogteam pulling a load of wood in the komatik (sled) (Aunt Annie Evans 2014c); or the antiseptic sap that heals a cut while you’re working (*Picea* spp., *Abies balsamea*) (Barry Andersen 2015). From back to front, you can look at how fishing itself supports plant practices: working with line and tying knots on the boat helps you understand the best way to do the filling on your snowshoes (Henry Jacque 2015); fishwater and kellup fertilise the garden and the wild rhubarbs (*Rheum* spp.) (Charles and Jim McNeill, Enid McNeill 2013); and the currants you picked while waiting for the fish to dry are given to an Elder, who makes a jelly to share with her neighbour (Aunt Ellen Andersen and Uncle Harold Andersen 2013a).

To illustrate the importance of plants in fishing, Aunt Nellie Winters has drawn a series of Inukuluks at a family fishing place. These images appear in Figure 5 on the next page. The description for this scene is below.

Figure 5 Plants and fishing – drawings by Aunt Nellie Winters

Inukuluk (“little people”) pen drawings by Aunt Nellie Winters depicting some of the ways that plants support fishing. With permission from the artist, drawings have been superimposed on a photo from Manaks Island, taken by Erica Oberndorfer. Clockwise from bottom left: barking the nets with juniper (*Larix laricina*) bark in an iron barking pot, with juniper bark lying next to the pot; making pitsik (dried fish), with fish keeping cool in a bucket of kellup (seaweed); pitsik hanging on a wooden net gallet; blackberry sod (*Empetrum nigrum*) smouldering in the smokepot to keep away the flies; fishing from a boat sealed with pitch (*Picea* sp.), with a killik (anchor) made of juniper (*Larix laricina*); smoking fish in the smokehouse with blackberry sod and rotten wood; gulls eating scraps from the fish and fertilising the land; storing fish in layers of salt and snow under conifer boughs on the hills; cleaning the nets of kellup, which will be used to fertilise the garden; picking berries while the fish are smoking, and harvesting tulligunnak (*Rhodiola rosea*) to help soothe sore hands from working with the fish; fixing the nets with a spruce netting needle. Drawings created by Aunt Nellie Winters 3 February 2016.

Plants are not just categories of food, medicine and materials. They are an essential part of an interconnected web of relationships that make life possible in Makkovik, as seen in the drawing by Aunt Nellie Winters, and as described in the preceding story about plants and fishing. These same kind of interconnections are visible in many other practices in Makkovik, such as trapping, hunting and wooding. In the case of fishing and trapping, plants support elements of local economy. In the case of hunting and wooding, plants support diet and home heating needs. But these practices have far greater importance than the economic, dietary and material factors to which complex cultural practices are often distilled. It is important to look beyond individual plants and individual practices, and try to see the importance of integrated plant practices at the community and cultural level. Plants are integrated into artwork, like embroidery and carving. They are central in celebrating and in mourning. They enable not just travelling, but safe travelling through weather forecasting and the ability to respond to emergencies. Plants are part of play for children, and part of cautioning children. Plants promote more than livelihood in the practical and economic sense: they help define life in Makkovik.

It would be possible to take any of these practices—hunting, wooding, woodworking, wood carving, travelling, responding to emergencies, warnings, playing, celebrating, forecasting—and, as in the extended example of fishing, make the connections between how these practices are supported by plants, and how in turn these practices support plants. Table 3 is intended to provide some context for the importance of plants to these other practices in Makkovik without going into this same level of detail. As in Table 2, we present the words of Makkovimiut plant mentors with overview comments in italics.

Table 3 Cultural practices in Makkovik supported by plants

Cultural practice	Description	Plant mentor
Hunting		
<i>Some of the first green growth in spring in Makkovik is the budding leaves of willows (Salix spp.). Makkovimiut eat these leaves, called uKaujak in Inuttitut, and so do bears when they emerge from their dens in spring. Successful hunting depends on knowing what, when and where animals are eating.</i>	“Them ones, look [uKaujak, willow buds, <i>Salix</i> spp.]. When they’re coming out in the spring they’re right short, eh. We used to go over there, see, on dog team, come back open water. We used to be over there when they’re just shooting out. Boy, we used to always eat them. When they’re about so long, they’re green, see? The old black bears, when they comes out in the spring, that’s the first thing he goes for is them shoots, when they’re hard to find food, eh. I seen him going like that, chewing at ‘em. And then I shot him.”	John Winters (2014a)
Wooding (harvesting wood)		
<i>Wooding is done in springtime in Makkovik when the snow is more compacted and easier to travel on. Makkovimiut haul wood behind snowmobiles in a komatik (sled). Wood is hauled in long logs (sticks) or cut into shortened lengths (junks).</i>	“Traditionally, everyone used to haul logs out, cause it was a lot easier. You didn’t have a komatik box back them, cause it was just dogs. So you had a flat komatik with the wood horns on, haul whole logs and just cut it once you got home. But these days with skidoos and a komatik box and a chainsaw, it’s just a lot easier just to saw it up out there and just haul home the logs right inside the box.”	Frank Andersen, in Frank Andersen and Andrea Hoyt (2013)

Woodworking		
<i>Most families do their own woodworking for items like komatiks. Woodworking depends on a deep knowledge of the characteristics of each tree species, and how they respond to different treatments, like water or steam.</i>	From notes: Some people used to soak planks in salt water to make them flexible, but only if they were making something where they needed to bend the wood. They'd tie up the planks and put them in the water for a couple of months. You don't need to do this for a komatik, though, only for things like snowshoes. Mr. Ford built his own komatik – most people still do. They buy the lumber or get logs and saw it if they have a sawmill.	William Ford (2014)
Wood carving		
<i>More carving in Makkovik is done with wood than with stone, unlike Inuit communities further north. Knowledge from wooding and woodworking is applied to carving: the properties of each species, how the colour of the wood changes with the age of the tree, or how certain wood responds to dyes. Knowledge of forest dynamics is also important in knowing where to harvest the more scarce poplar and birch, such as in burned-over areas.</i>	“Poplar and birch, that’s the two main ones eh... poplar, that’s hardwood, see? And when it is good soft for carving at first, you put it to soaking in the water. But when it dries, it turns hardwood eh, and it’s hard to break then... In the night I puts my block of wood, just a block of wood eh, put it to soaking in the water overnight. That’s what I was told to do, eh. I was told to do that, right, by an older man. Sure enough, it’s right easy to carve, eh. When I’s be carving, have old damp cloth over your carving is good too, and just expose part, keep whittling away. But keep the main thing what you’re carving with a damp dishcloth or something, and then your wood don’t dry out right away, see? That’s the little trick, eh. That’s what I’ve found is really good, because it’s so soft, eh, when it’s moist.”	John Winters (2014a)

Travelling		
<p><i>Snowshoes are typically made of juniper (Larix laricina) or birch (Betula papyrifera). Labrador snowshoes are larger in circumference than most other regions in Canada due to the exceptionally deep snow. They are also almost completely round for greater flotation. They are indispensable pieces of equipment for wooding, for checking traps, for hunting, and for travelling. They are an essential piece of survival gear and are always carried on snowmobile. When travelling by dogteam, men would often have to walk in front of their dogs and komatik to help beat down the snow, and help pull loaded komatiks up a hill. The skin boots that Makkovimiut traditionally wore in snowshoes are made of sealskin and are watertight.</i></p>	<p>Charles McNeill: “And you go in [the house, after caribou hunting] and you hardly know how to walk because you’re used to only walking on snowshoes, you see. You get outside the tent, you put your snowshoes on, your snowshoes would be on all day long. The only time you would take off your snowshoes is when you go inside the tent, and then you didn’t walk, you made a couple of steps. So when you got to walk without snowshoes on, it feels funny, on a hard floor.”</p> <p>Jim McNeill: ”And you walk on the hard path, eh, the footpath in the community. And you’re walking in the footpath in the community or something in your skin boots on. And I suppose you’re in such good shape, eh. You feel like jumping, eh. Every now and then you’d feel like jumping over something. You know, like, when you’re out working, I mean, you’re jumping, you’re handling a komatik and you’ve got to jump, you have snowshoes on and you’re going down in through the trees, and the dogs going down through the trees. You’d have to be able to jump, be able to jump, from one side of the komatik to the other with your snowshoes on, right over the thing, with your snowshoes if you needed to. So you know, you were in good shape.”</p>	<p>Charles McNeill and Jim McNeill (2013)</p>
Responding to emergencies		
<p><i>Survival skills are learned from families and also taught through Junior Canadian Rangers.</i></p>	<p>From notes: The inner bark of the juniper (<i>Larix laricina</i>), the part that porcupines eat, can be used to ingest some nutrients. Scrape off the thin film, boil it, and drink the broth.</p>	<p>Barry Andersen (2015)</p>

Warnings		
<i>Some plants are well-known to Makkovimiut as toxic if eaten, including hemlock (Angelica atropurpurea) and deadly nightshade (Geocaulon lividum). Accounts of poisonings endure in oral accounts and in written historical narratives (and in this first-person account!). Plants such as foxberry (Arctous alpina) are not toxic but are considered unpalatable.</i>	“Did I get sick! I ended up in the hospital. My Mother was telling me, don’t eat them, don’t eat them. Don’t eat the orange berries [deadly nightshade, <i>Geocaulon lividum</i>]. So I ate five of them. I remember, they rushed me out, they rushed me out to the hospital. When I take off my shirt now, there’s five marks on my chest. White marks, berries busted out here. That’s what they said it was anyway. That orange berry. Them days, I was five or six years old, there was no hospital. When I left I was so sick, they had to get a plane in, took me out. There were five marks right here. Next time we’re meeting at the hospital I’ll show you!”	Henry Jacque (2014c)
Playing and games		
<i>Children learn about plants by playing with them. They also learn about new plants to eat from other children – this was especially true when Inuit from other communities were relocated to Makkovik (Frank Andersen, in Frank Andersen and Andrea Hoyt 2013).</i>	“Did you ever rub the leaves on your hands [crackerberries, <i>Cornus suecica</i> , <i>C. canadensis</i>]? You rub the leaves on your hands and rub it on your face, it’s like needles.”	Aunt Annie Evans (2014c)
	From notes: Kids would strip leaves off the bumblebee flowers (<i>Chamerion angustifolium</i>) and leave the flower buds on as the arrow flight, and throw them like arrows at each other.	Randy Edmunds (2013b)

Celebrating		
<i>Plants are important in marking events throughout the seasons, such as weddings, funerals, and Advent. Spruce beer is made for celebrations, and was formerly common to have at Sunday dinner. A non-alcoholic version was made in springtime as a tonic.</i>	“Spruce beer, my brother-in-law made it. And like, you could have it at the dinner table. I suppose if you let it brew for longer, then overnight it would be strong, eh. But you had molasses, you sweetened it. Like boiled the boughs, and then you strain it, and sweeten it with molasses, and put a yeast in, and probably a handful of raisins... And next day, like, it will be like a fizz on it, almost like a pop. That’s good, that’s really good...It can go overnight, it’s fit to drink and it’s not strong.”	Aunt Annie Evans (2013a)
Forecasting, indicating		
<i>Plants help to predict the weather for the coming season; and weather is also used as an indicator for the time to harvest plants. Redberries (Vaccinium vitis-idaea) are only picked after a frost. Plants also help to predict other plants; for example, lilies (Menyanthes trifoliata) in a pond means that the area is also good for bakeapples later in the summer (Aunt Annie Evans 2014c).</i>	“The old saying used to be, with a lot of dogwood berries [<i>Sorbus decora</i>] is going to be a lot of snow.” “When the trees look black in the morning, something is coming, some bad weather. You can see it better in the winter, how the trees look black, but it’s true for all times of the year.”	Aunt Nellie Winters (2013b, 2016)
	From notes: Usually after the first snow, the kind of snow that leaves – that was the indicator to go and pick grass, before the snow came to stay. Carol used to be going all around in truck to the good spots. The grass used to all be ready to pick at the same time. Now, when you go around, half of the grass is still greenish and not ready to pick yet, and the other half is already flattened down and no good to pick. Carol didn’t get any grass this year.	Carol Gear (2014)

3.3.3 Beyond practice – valuing plants

Utility is an important concept in discussions of knowledge. Many Indigenous scholars consider utility a fundamental tenet of knowledge (Crazy Bull 1997, Wilson 2001, Louis 2007, Wilson 2008, Kovach 2009, Bull 2010). Manulani Aluli Meyer writes, “Knowledge must be useful or have a function for it to be meaningful or important” (2001, 195). “Useful” does not necessarily mean in a practical or tangible sense. Meyer asks, “What are the characteristics of a plant? Does it describe an idea, person, or place? Does it heal, is it food, how does it link us with our history? Do we use it for bowls? Do we use it for canoes?” (Meyer 2001, 196). When we consider the utility of a plant to Makkovimiut, we need a similarly expanded understanding of the word that goes beyond the conventional categories imposed by external researchers. Plants in Makkovik are not just useful in this conventional unidirectional way of objects. Plants have greater purpose in Makkovik that is experienced through personal, family and community meaning, and that indicates value as well as practical use. Relationships with plants in Makkovik speak to both the broad and very personal value of plants.

3.3.3.1 Plants and naming

“The names on our lips reveals the knowledge we have of each other” (Kimmerer 2003, 2). Plants have names when people have relationships with them (Meyer 2001), and these names show recognition, respect, and intimacy (Kimmerer 2003). Aunt Nellie Winters speaks about how names for plants are linked to personal meaning, how plants look and feel to us: “I think we always try to find out the names of flowers we call pretty. But what we didn’t call pretty we didn’t even try to find out! It’s true” (Aunt Nellie

Winters 2014b). Names emerge from specific relationships, rooted in place, practice and memory. This is why it is so important to value local and personal names for plants, so that they can continue to express the personal connections that people have to plants and to place, and so that names may link us to our histories. Names for plants also acknowledge relationships between plants and other animals; for example, the Makkovimiut name bumblebee flower (*Chamerion angustifolium*) shows acknowledgement of the plant's importance as a nectar source for bees. Plant mentors were not sure why some Inuttitut plant names had remained in common use, while others had been replaced by English names. Tulligunnak (*Rhodiola rosea*) and kutsuk (spruce gum, *Picea* sp.) are names that are spoken by both Elders and younger Makkovimiut, and uKaujak (willow buds, *Salix* spp.) is a word used predominantly by Elders.

3.3.3.2 Memory

That plants are linked to place and memory is very evident in speaking with Makkovimiut Elders. Aunt Annie Evans remembers returning to her winter home at Adlavik after summers fishing at October Harbour, where she and her sister Aunt Ruth Flowers would run together along the beach: "We were excited to run and see how high the grass had grown since we left. Sometimes 'twas over our heads" (Aunt Annie Evans 2015a). Names for specific landmarks at family homes are also linked to names for plants:

John Winters: At Adlavik, blue flowers over there, what did Aunt Muriel say?

Aunt Annie Evans: Bluebells bank (bluebells, *Campanula* sp.).

John Winters: I seen that place too.

Aunt Annie Evans: Bluebells bank. They grow up there a lot.

John Winters: And down where that old well, too, where they had their old water well. There's some other kinds planted down there.... Down where the well is,

Annie, there's like a spring eh, or a brook, but there's a big well there. Well, right around there, there was some there, little old plants. They bloom in the spring. I don't know if they bloom all summer. We used to call it Bluebells Bank (Aunt Annie Evans 2014c, John Winters 2014b)

People who were forcibly relocated to Makkovik from northern communities like Hebron and Nutak often speak of the plants of their family homes: "The wild poppies grew down there, under the hill in Nutak, they were growing under the hill. Beautiful poppies, some red ones. I don't know if someone had put seed there one time or not, but they came every year" (Aunt Nellie Winters 2013b). Many people who experienced these traumatic relocation events have transplanted flowers and trees from these family homes to Makkovik in remembrance of their former homes.

3.3.3.3 Aesthetic value

Plants are aesthetically valuable and meaningful even when they are not directly connected to family places or personally meaningful spots. Aunt Nellie Winters says: "Plants, they brightens up the place, especially for older people. Without plants, there would be only the ugly stuff. We're all fond of plants, especially as we get older. Everywhere people are fond of plants. It's good to see the flowers on the land. Even the fall colours, it's pretty in the fall. It's even pretty when they're dying" (Aunt Nellie Winters 2015).

This love for the beauty of plants has immediate effects on harvesting decisions. Mr. Charles McNeill discusses how "the look of the pretty trees" influences how he selects trees to cut for firewood or lumber:

E. Oberndorfer: What about how you choose trees? What are the criteria for which trees you select and which trees you leave?

Charles McNeill: Well, whichever kind of wood you're looking for, I guess. For firewood, you don't really go for the best wood. Because, I don't know, there's lots of wood good for sawlogs, or... And then you don't cut that wood that's good straight grain because it's good for logs, or just you might need it some other day. You don't cut that for firewood. You just cut wood that's not so good, for firewood. And me, I just like the look of the pretty trees. I don't want to cut it all.

E. Oberndorfer: You don't want to cut it all?

Charles McNeill: No.

E. Oberndorfer: You just like looking at it?

Charles McNeill: I just like to leave it there.

E. Oberndorfer: Oh, ok. Are there any other reasons why you wouldn't cut a tree?

Like, you like the look of it, or it's a beautiful tree or?

Charles McNeill: It's just such a beautiful spot of woods. It's like, leave it, it's too pretty to cut. Makes the place look nice, too. Some places where you cut wood, it spoils the look of the place if you cut it all out.

E. Oberndorfer: It would be a very different sight coming into Makkovik if there was no Moravian Woods.

Charles McNeill: That's right, yeah. There's only certain places where I can go for wood. All up the side of the brooks and stuff we don't cut at all, because I leave it for partridges and the trees is all pretty (Charles McNeill, in Charles McNeill and Enid McNeill 2014)

3.3.3.4 Learning, healing, sharing

Plants are valued for the opportunities they offer to be outdoors, to learn important skills

through practice, and to share time with family and community. John Winters' description of

wooding address all three of these values:

"I think everybody likes getting wood cause in the spring the whole crowd goes, women and everybody, children and everything, eh... Boy, some take the whole family! But it's good cause the little kids love doing it eh, a little junk [log of wood]. I've seen 'em at that. It's good alright, they all go for a ride, eh, and get a whole lot of wood in one time. They'll be at that again later on cause they'll have the trail groomed. I've seen 'em before, boy, whole families of them. But good help, eh, all the little kids [...] And all get out in the good old sunshine and that, eh" (John Winters 2014a).

Many Makkovimiut express the importance of learning about plants from family, and

learning by doing. Practices such as wooding are an active way to learn about trees:

Young people need to be taken in the woods and shown how to do things properly.

They're making mistakes when it comes to knowing about plants. Some people think that they harvested dry wood, dead wood, because the juniper had brown needles. They thought the juniper was dead when it had brown needles, because it looks dry. It's not dead! They just don't know. We need to talk to our kids, have conversations about which trees are which. That knowledge has got to be taught. It's not automatic. They don't know what to get if you just send your kids in the woods. You need to show kids what is what. Almost every picture of Tony has him pointing. He's pointing out something that he's talking about (Mary B Andersen 2015a).

When children go wooding with their family, they are learning more than how to recognise trees and cut wood. They are also learning how to travel safely, recognise landmarks, be resourceful, have patience, solve problems, and learn about their history: "Storytelling happens when you're outside [...] Whenever you get a chance to go off, you can share your history, though stories. It's an opportunity to connect with your past, but also to develop closer ties with family and kids. You're making sure that that oral history is learned" (Carol Gear 2015a).

Relationships with plants are important to the health and well-being of Makkovimiut. Practices such as berry-picking are a reason to get outside and be physically active:

There's some people you hardly see them throughout the year, but as soon as the berries are ripe, every day you see them walking off. Right? And then you get really tickled, I know I get really tickled, because sometimes you can see the, like, oldest kind of people out, that's their thing, they really enjoy it [...] And it's good exercise, too, cause you don't realise if you're picking berries, after a while your back starts to get stiff and you got to stretch out, so, like how many times do you have to bend down to pick out berries, and "Oh, another patch over here" and you bend down to pick those. So they don't realise how many like toe touches they're doing throughout the day. You feel it the next day, though, when you wakes up and you're like, "Oh my God!" Hell of a workout on your legs, like climbing over rocks and all this and that, and then the toe touching and stuff (Carol Gear 2013a).

Relatedly, plants are essential for mental health and happiness: "When you come across

the Necks, you smell the fresh berry bushes and moss, and it makes you feel so happy. It puts you in a different frame of mind. It is cleansing—spring is here—and it rejuvenates you. It stops the clock for however long you're there" (Carol Gear 2015b).

Plants have strong community value in Makkovik when they are shared with Elders, and with people in the community who are unable to harvest plants themselves. Plants, especially berries, are also shared between communities in Labrador:

There are people that go off and they get more than what they need only because another thing that's been instilled in most of us is the sharing aspect of it. If you go off and you pick a whole lot of redberries or blueberries or blackberries, and they may not be as plentiful say in Nain or north of Nain, and you got a lot of family and friends there that are craving it, especially the Elders. Like I mean, you're not going to be able to supply everybody with everything, but you know, you get some packed up and if you're heading that way you take them to someone and you know they're going to make some really nice pies for like someone's birthday or special occasion, right? (Carol Gear 2013a).

3.3.4 Summary

When asked what she would most like other people to know about plants in Makkovik, Mary B Andersen answered that people should realise:

[...] how plants are a big part of our lives, how they play into our lifestyles, and being able to maintain our lifestyles. They allow for our livelihood, and allow us to be self-sufficient. With plants, we don't depend on the store so much. We have a choice – plants give us a choice. Plants allow a healthier lifestyle for us. The whole land is my garden. Without plants, we wouldn't be able to have the same livelihood. Without plants, we wouldn't be the same unique people" (Mary B Andersen 2015b).

Plants in Makkovik support livelihood and lifestyle for Makkovimiut. Individual species are food, medicine and materials. Plants are integrated into cultural practices such as fishing, hunting, and travelling, which themselves support plants and plant practices. Plants are useful in a broad sense of the word, in having personal, family and community

value. Collectively, plants help Makkovimiut be the “unique people” Mary B Andersen describes.

3.4 What we learned, PART B – How Makkovimiut shape plant communities

Plants in Makkovik support lifestyle and livelihood. But relationships with plants are reciprocal, even cyclical. Practicing relationships with plants is an ecologically creative process, through which people author a landscape that is cultural (Balée 2006). Just as plants sustain Makkovimiut cultural practices, so too do cultural practices shape plants and landscape. The expression “Our footprints are everywhere” (Brice-Bennett 1977) succinctly articulates the belief that if you can find a place to go ashore along the Labrador coast, someone has been there before. How those historical footprints are expressed in landscape is a matter of knowing how to look for them.

3.4.1 Landscapes are cultural

Most places on Earth have been transformed by cultural processes (Redman 1999, Denevan 1993, Crumley 1994, Balée 2006). The effects of these transformations in the landscape are often remarkably enduring (Balée 1989, 1993, Stahl 1996, Foster et al. 2003, Heckenberger et al. 2003, Dambrine et al. 2007, Abrams and Nowacki 2008, Heckenberger et al. 2008, Munoz and Gajewski 2010, Fowler and Lepofsky 2011, Ross 2011, Ross and Rangel 2011). Some changes to landscape are unintentional or indirect outcomes of other actions (Gilmore 1931, Balée 1993, Forbes 1996, Mack and Lonsdale 2001, Abrams and Nowacki 2008). But many transformations to landscape are implemented intentionally. Irrigation and earthworks engineering have wrought

significant changes to soils, wetlands, and forests (Heckenberger et al. 2003, Mayle et al. 2007, Heckenberger et al. 2008). The strategic use of fire has helped humans select for particular plant species and habitat types (Cronon 1983, Patterson and Sassamann 1988, Blackburn and Anderson 1993, Weber and Flannigan 1997, Anderson 2005, Black et al. 2006, Abrams and Nowacki 2008). Indigenous trading and transplanting has affected the phytogeography of culturally important plant species (Gilmore 1931, Gorham 1943, Rousseau 1966, Minnis and Plog 1976, Wilson et al. 1988, Blackburn and Anderson 1993, Turner and Loewen 1998, Nabhan 2000, Huisinga 2001, Black et al. 2006, Parker et al. 2010). Vast landscapes previously considered to be untouched wilderness, such as the Amazon, have proven to be designed and managed by Indigenous peoples (Balée 1989, Balée 1993, Heckenberger et al. 2003, Balée 2006, Heckenberger et al. 2007). The same is true for cultural forests of Mesoamerica (Campbell et al. 2008, Ford 2008, Ford and Nigh 2009, Ross 2011, Ross and Rangel 2011), and the cultural meadows of the Pacific west coast (Beckwith 2004, Deur 2000, Deur 2002, Deur and Turner 2005, Turner and Turner 2008).

3.4.2 Historical landscapes in Labrador – cultural origins

Like many northern places, Labrador has been described as an uninhabited wilderness untouched by people (Foster 1983). On his 1534 voyage, Jacques Cartier famously referred to it as “nothing but moss and small thorn bushes, dry and half dead; in fact, I think this is the land that God gave to Cain” (Stephens 1890, 17). In his journals, George Cartwright described the region’s “poverty of soil, short summers, long winters, and severe frosts” as impediments to growing food (Cartwright 1792, 236). Labrador has no

known history of extensive cultivation or plant tending to support high population densities. Consequently, the region has not seen the kinds of large-scale landscape transformations used elsewhere in the Americas to support extensive systems of plant food production. Nevertheless, on smaller and more localised scales, plant communities in Labrador have been shaped by people in both unintentional and intentional ways.

Soil disturbance and nutrient additions at human settlements along the Labrador coastline have had long-standing effects on plant communities. In 1771, George Cartwright remarked upon the visibly different appearance of vegetation at former Inuit camps, as well as at former sealing and codfishing stations along the coast: “And the south-west point of Great Island, on which I had a cod-fishery for three successive summers, is now covered with grass, where nothing but heath formerly grew” (Cartwright 1792, 238). These habitat changes are consistent with the conversion of European heathland to grasslands through nutrient enrichment (Heil and Bobbink 1993, Power et al. 1998). Wooding patterns by Inuit have also changed forest boundaries, resulting in both deforestation and afforestation in different areas (Lemus-Lauzon et al. 2012, Roy et al. 2012). Settlers were responsible for unintentionally introducing weedy European species in Newfoundland and Labrador, which were carried by “ballast, wool, seed stock, straw, animal fodder, and soil” (Bain and Prevost 2010, 32).

Cartwright (1792) and Low (1896) both discuss the practice of setting signal fires in Labrador by setting fire to the land, a mode of communication used by Inuit and Innu (First Nations):

On observing a collection of brush wood and other dry fuel, I naturally concluded, that I was to be sacrificed; but whether they intended to roast me alive or dead, I could not determine. I did not, however, long remain in suspense, for Shuglawina soon dispelled my fears by telling me, that we had done business enough for one

day, and therefore he had brought me there to look out for vessels at sea (that station commanding a view quite across the straits of Belle Isle as far as Quirpon and the adjoining parts of Newfoundland) adding, that the wood was to make signals to them (Cartwright 1792, 143).

If lighting vegetation on fire was not already an established signalling practice among Cartwright and his crew, it was soon adopted:

At eight this morning the vessel was discovered about four or five miles to windward of Blackguard Bay. She could have come into the harbour very easily; but hauling her wind, she weathered the Gannets, and stood out to sea again; which makes me not know what to think, although by my glass I could plainly descry her to be a ship and am certain she is mine. I immediately ran to the top of the highest hill, and set fire to some bushes there, but she took no notice of it" (Cartwright 1792, 359).

These signal fires, as well as poorly tended campfires, are blamed for many of the large fires that burned throughout the interior and along the coast:

At least one half of the forest area of the interior has been totally destroyed by fire within the past twenty-five or thirty years. These fires are of an annual occurrence and often burn throughout the entire summer, destroying thousands of square miles of valuable timber, to the south of the central watershed. The regions thus devastated remain barren for many years, especially towards the northern limits, and the second growth of black spruce, Banksian pine, aspen and white birch is never as good or as large as the original forest. These fires are due to various causes, but the majority of them can be traced to the Indians, who start them either through carelessness or intentionally. The Nauscapee Indians of the semi-barrens signal one another by smoke made by burning the white lichens that cover most of the ground in the interior, and these signals cause many of the fires. The southern Indians signal in a similar manner, but do not practice it to such an extent as their northern brethren, having found that they are rapidly destroying their hunting grounds. Careless camp fires in dry seasons are another common cause of these forest fires, and many of those ascribed to lightning, if closely traced would be found to have been set by wandering Indians, who are only careful on their own hunting grounds. From what is seen on the explored routes of the southern watershed, it would appear that at least one half of the forest has been removed by this cause (Low 1896, 36).

Cartwright describes several instances of his own party setting the woods ablaze through negligence:

Langman went on shore at Olivestone to roast a haunch of venison, and bake a venison pasty; just as they were ready, the woods caught fire, and burnt with great fury, which forced him and his assistants to make a precipitate retreat: though he saved the venison and implements of cookery; but a boat's sail and a few other things were considerably injured by the accident (Cartwright 1793, 28).

Cartwright carefully notes the visible long-term effects of fires on plant communities:

When a fire happens on a peat soil, at the end of a very dry summer, the whole of it is burnt away to a great depth; and will not only produce no good timber again, but also, is both dangerous and troublesome to walk over; for great numbers of large stones and rocks, are then left exposed on the surface, and the Indian-tea, currants, &c. which grow between, often prevent their being discovered in time to prevent a bad fall: but if the fire happens early in the summer, or when the ground is wet, the soil takes no damage” (Cartwright 1792, 224).

Historical documents also show intentional management of plants in Labrador by different peoples; that is, targeted alterations to plant communities that are designed to produce specific outcomes. Fire again features prominently in these intentional people-plant relationships. It’s been speculated that fire is not commonly used in northern forests as elsewhere because of different modes of travel, hunting strategies, and lack of agriculture (Speck 1940). However, Low describes fire as a bear-hunting tool used by Innu in the Labrador interior:

At times the Indians purposely burn large areas in order to prepare the ground for bear-hunting; for within a few years after a fire, in this region, the surface becomes thickly covered with blueberries and other small fruits, forming feeding grounds for bears during the autumn months (Low 1896, 98).

Large fires have long been thought to have negative effects on barren-ground caribou habitat by reducing the availability of mat-forming lichens (Scotter 1964). However,

early-successional habitats adjacent to burned areas have more recently been shown to offer caribou herds some advantages in foraging, travelling and predator avoidance (Anderson and Johnson 2014). It is purely speculative, but localised fires could have been used to stimulate grass and shrub growth for caribou in coastal areas - though it is not clear from the following text if fires were intentionally set for this purpose:

The timber in the woods hereabouts [near Koksoak River, Nunavik] is not large: we found none fit for masts. The largest trees were not more than eight inches in diameter, and fifteen or twenty feet high. They are chiefly larch and pines. In some places we found them burnt or withered, and were informed by the Esquimaux, that it was the effect of the Indian's fires. Indeed we saw several places where the Indians had put up huts, and left sufficient vestiges of their abode. Berries grow everywhere, and between the river and the wood, the plain is chiefly covered with willows, high grass growing between them, but these and the various shrubs are so low, that a man can easily look over them. In every direction we saw the tracks of reindeer, and there is every appearance of its being a place much frequented by these animals (Kohlmeister and Kmoch 1814, 74).

Cartwright writes about fire as a tool used by seasonal Newfoundland fishermen in Labrador, who would set fire to forests upon their departure each fall to create stands of dry fuelwood for the following year:

At the close of the fishery, the greater number of the planters leave their small houses on the coast, and proceeding to the heads of various bays, go into their winter quarters in their small houses there. During the winter they are engaged in hunting fur-bearing animals. These also are not so plentiful as formerly owing, probably, to the large areas burnt over, either from fires accidentally made, or set on purpose by the owners of schooners, who often fire the country along the shore, so as to easily make dry firewood for future seasons (Fitzhugh 1999, 84).

Cartwright himself advises a correspondent on the best way to set fire to an island – whether this is for clearing vegetation or creating dry firewood is unclear: “Where you find too much Covert upon any island burn it so soon as dry after a good deal of Rain. Never set woods on fire after a long dry time, for you will burn all the soil” (Stopp

2008, 205). Fire was also used to improve soil fertility for gardens in Labrador, as demonstrated by Cartwright's description of his own gardening practices in southern Labrador: "A fire was made of stumps, sod &c. on the spot next to the garden door; another piece was manured with rotten kelp and ashes, for cabbages and more radishes" (Cartwright 1792, 181).

Moravian missionaries cultivated extensive vegetable gardens at their mission stations. The first Moravian missionaries who landed at Nisbet Harbour (near Makkovik, locally known as Ford's Bight) carried seeds among their supplies and planted a garden by their house (Rollmann 2002, Rollmann 2009). On visiting the Hopedale mission gardens in 1893, Dr. Eliot Curwen reported seeing "celery, cucumber, cauliflower, beet and carrot coming on, and lettuce, kohlrabi, cabbage, curly cabbage, spinach and parsley" (Rompkey 1996, 100). In the case of the garden at Hopedale, garden soils were supplemented with hundreds wheelbarrows of earth and sand from nearby areas (Rollmann 2002). Soils at mission gardens were further enriched with kelp (Rollmann 2002), capelin (Taber 1895), and in some cases human wastes (Annie Evans 2013b). The missionaries also created and tended pleasure gardens with imported ornamental plants from Europe, including roses, edelweiss, lilacs, and pansies (Prichard 1911). *Delphinium* sp. and Icelandic poppies are now naturalised in Makkovik and other communities, as well as at family settlement areas.

Moravian missionaries imported and cultivated European herbs such as arnica and chamomile for medicinal purposes. Chamomile was used as an antiseptic for cleaning wounds (Aunt Annie Evans 2016). Missionaries also collected Labradorian species that were close analogues to European species of medicinal value, such as the arnica and

coltsfoot collected by Kohlmeister (Kohlmeister and Kmoch 1814; probably *Arnica angustifolia* and *Petasites frigidus*; C. Hanel, pers. communication, 21 March 2013).

Arnica was grown and used by Reverend Richard Paul Hettasch when he served in Makkovik 1932-1934) (Aunt Annie Evans 2016). Chamomile was grown by Reverend Gerhard Johannes Vollprecht sometime between 1954-1961 in Makkovik, and foot traffic eventually spread chamomile seeds in Makkovik and Hopedale so that it now naturalised in some front yards (Aunt Annie Evans 2016). Some of this naturalised chamomile predated Reverend Vollprecht in Hopedale because Aunt Annie Evans remembers, “you could smell it when you walked around” (Aunt Annie Evans 2016).

European culinary herbs were locally grown and used in the kitchens of the mission stations. Aunt Annie Evans remembers seeing dill and parsley hung to dry in the Manse windows, and Missionary Frieda (Glaser) Hettasch sent home-dried savory to her daughter who was away at university (Aunt Annie Evans 2016). Kate Hettasch started parsley at the mission station in Hopedale and transplanted it to Makkovik. The kitchen herbs at the Makkovik mission were unfamiliar to Makkovimiut, and caused great concern with Makkovimiut as they resembled poisonous local plants:

When I worked in the Manse and the missus gave me this green stuff to cut up for to put in the salad, it smelled so much like hemlock [*Angelica atropurpurea*] I asked her where she got it, cause I thought she might not know. And she told me they started it in window boxes in the house and then they put it out in the hot bed, and it was parsley [...] that’s when I knew it was ok, we’re not going to be all poisoned after all (Aunt Annie Evans 2013a).

One of the most successful transplants introduced by Moravians to Labrador is rhubarb. Rhubarb was a prominent feature of most mission stations, and is now a common garden plant in Makkovik, as well as being extensively naturalised at former summer fishing

homes along the north coast. Rhubarb persists without tending at former mission stations such as Okak, where it is said to grow exceptionally large and abundantly (Aunt Annie Evans 2014c, Aunt Nellie Winters 2013a). It also persists in the Labrador interior at former Hudson Bay Company Posts, as noted by Low when he visited Fort Nascaupsee twenty years after its abandonment: “Close to the house were several patches of rhubarb eighteen inches high, while a number of introduced plants still flourish in the old doorway” (Low 1894, 154).

3.4.3 Makkovimiut landscapes

Makkovimiut are well-aware of the incidental effects of their own land use on plant communities. Disturbed areas by family cabins are known to be ideal harvesting places for currants (*Ribes glandulosum*) and strawberries (*Rubus arcticus*) (Aunt Annie Evans 2012). It is easy to see where someone has harvested blackberry (*Empetrum nigrum* sod) for their smokehouse by the rectangular cuts in the sod, though these holes refill quickly with new vegetative growth in about five years (Aunt Annie Evans 2016). Areas where there were formerly houses and are now covered by grasses, willows (*Salix* spp.) and raspberries (*Rubus idaeus*). The latter grow very well in areas where people used to empty their “honeybuckets” (latrine pails) (Marilyn Faulkner 2013). Hemlock (*Angelica atropurpurea*) grows abundantly at sod houses (Todd Broomfield 2014a).

A few introduced weed species are also reported, such as chickweed at one cabin garden (Enid McNeill 2013) and at West Turnavik, formerly a commercial fishing station (personal observation). Increasingly, curly dock (*Rumex crispus*) grows in disturbed areas in Makkovik:

[W]here they're doing so much development in town now, where they're bringing in bags of sand, like from different parts of Labrador, I guess, and even the island in some places when they get the tugboats in, depending on who the contractor is and where they're from. Like, we've been getting a lot of different species of flowers, and plants, and bugs - and I'm not fussy over the bug part. But I was telling you there was this one ugly, really ugly flower—it's nice, it's like tall and it's green—but when it starts to wither it's just this huge, ugly, dark brown, really ugly thing. And I was talking to my mother-in-law about it and she said that they called them German rhubarbs. And she said the only time that they've ever seen them in her community [Postville] as well is when they were putting in the new water and sewer lines. And that may have been too because of the ground or whatever was brought in, or the sand that was brought in [...] [S]he said they're like not native, and she said you don't see them all the time, so you know you might go ten or eleven years without seeing them, but then if you go back and think about it, "Oh yeah, when they put in a new subdivision they came about." So they must be in the sand or whatever they're bringing in here (Carol Gear 2013a).

3.4.4 Caring/managing for specific plants

Plant practices in Makkovik help shape plant communities by encouraging particular plant species and discouraging others. "Management" is not a word that is frequently used in Makkovik with respect to plants, animals, or landscapes. It is more common to speak of plant practices in terms such as taking care of plants, showing respect for plants, or helping plants. These concepts better reflect views that plants have a voice, feelings and purpose: "I think a plant sleeps and wakes up same as we do. They got a purpose to be put on this Earth" (Aunt Nellie Winters 2014a). Plants are not inanimate objects to be managed, and people do not control the lives of plants. Relationships with plants are reciprocal, and there are repercussions for people when they do not act respectfully towards plants. From a Makkovimiut perspective, it is people that need to be managed, not plants or animals: "If you look at oceans and fish, they've been around millions of years... and to say we've got to manage them... I think it's the people who have to manage themselves" (Eric Andersen 2015). We use the term plant

management here with the understanding that it includes broader cultural dimensions such as respectful behaviours, rather than simply the physical practices that manipulate plant communities. Some management actions are directed at the level of individual plant species. We discuss these species and these management practices in the following sections.

3.4.4.1 Fire

Many Makkovimiut prefer to get their wood from areas that have previously burned. However, there are strong prohibitions against intentionally setting fires in Makkovik, and fires are not deliberately set to create dry wood. Lightning strikes create sufficient areas of burned wood that are accessible by snowmobile from Makkovik, though all burned woods become cut-out over time and wooding areas shift as new burned areas open up. Though there are some fears about the inherent danger posed by wildfire, nearby fires can also be welcomed as they reduce travel time during wooding, and provide excellent opportunities for berrypicking. Speaking about a fire that burned across the bay from Makkovik in the 1950's, John Winters says, "When Old Man's Head burned, they were some glad!" (John Winters 2015b).

There are very localised ways that fire is used to manage plants around family cabins. In the spring, grass is burned on a patch-by-patch basis around cabins to keep grass mouse populations in check (Errol Andersen 2013), and to encourage the healthy growth of new green grass (Aunt Annie Evans 2015c). Grass is only burned early in the spring when the snow has just melted and the grass is still wet, which helps ensure that only the top layer of dried grass thatch burns (Aunt Annie Evans 2016). Even small scale

burns are not without risk, as buildings can catch fire (Aunt Annie Evans 2015c). In the isolation of separate bays or on islands, uncontrolled fires would pose significant dangers to families.

3.4.4.2 Transplanting

Berry bushes are not transplanted as a rule, though Aunt Nellie Winters harvests bakeapples from plants she transplanted to her lawn in Makkovik (2013c). Naturally-occurring mint (*Mentha arvensis*) has been transplanted from family areas to Makkovik by several families. Aunt Annie Andersen has transplanted mint from Ben's Cove to Makkovik (Aunt Annie Evans 2013b). Mary B. and Tony Andersen have transplanted mint from Tom's Cove to Makkovik, and Mary B. Andersen confirms that her ancestors originally brought the mint to Tom's Cove (Mary B. and Tony Andersen 2013). Mint is used in food, as medicine, and is also transplanted for sentimental reasons (Aunt Annie Evans 2015d): "What our ancestors planted, it's good to bring here. It's the same with bringing rhubarbs to Makkovik" (Mary B. Andersen 2016). Chives (*Allium schoenoprasum*) are similarly transplanted for food and sentimental reasons. Though *A. schoenoprasum* does occur naturally in Labrador, this species is likely an introduced one at family places and in Makkovik. Both mint and chives self-propagate once transplanted and chives in particular are a common sight along some parts of the Makkovik shoreline.

Many plants are transplanted for personal, aesthetic and sentimental reasons. Relocates from Hebron and Nutak have transplanted poppies and trees from their former communities to Makkovik (Aunt Nellie Winters 2013a) because "they are a reminder of home, of something that will always come back" (Aunt Nellie Winters 2016). Local

wildflowers are transplanted to the cemetery (Marilyn Faulkner 2013), native wild plants such as saltwater flowers (*Senecio pseudoarnica*) are transplanted from family cabins or nearby areas to Makkovik (Aunt Annie Evans 2013b; Uncle Mun Andersen 2013), and trees such as jack pine (*Pinus banksiana*), pin cherry (*Prunus pensylvanica*), and balsam poplar (*Populus balsamifera*) are transplanted from Goose Bay (John Winters 2014a), thereby extending their northern range in Labrador. Moravian missionaries also transplanted native species from woodland areas to their mission stations in attempts to create recreational forests:

On 7 June 1901, Brother Fritz Nestle went by sledge to Napartok [the wooded area south of Hebron] and took from there a large number of forest plants [“Waldpflanzen”], which he planted in the empty garden plots at Hebron “in the hope that there might be one day a Hebron forest” [“Hebroner Wald”] (Moravian Diary of Hebron 1901; reference kindly supplied by Dr. Hans Rollmann).

One of the most well-known transplants in Makkovik and at family places is rhubarb. Many Makkovimiut have a rhubarb patch outside their homes in Makkovik. Rhubarb grows at at least one summer fishing station (West Turnavik, Evans’ family fishing place), as well as at former winter homes. Rhubarb has effectively been naturalised in these places and successfully seeds itself. At Tessialuk, formerly a busy wintering bay that was home to many families, there is an entire lawn of rhubarb. It is a plant also enjoyed by black bears, who eat the stalks and discard the toxic leaves (Todd Broomfield 2015b). Although rhubarb is usually transplanted or self-seeded, people do grow rhubarb by seed in Makkovik, and actively scatter seed in their yards from mature plants (Uncle Mun Andersen 2013).

3.4.4.3 Tending and weeding

Rhubarb patches are actively tended by Makkovimiut, especially the naturalised rhubarb patches at former family homes, where shrubs and grasses have rebounded in the time since families moved permanently to Makkovik. Families care for the rhubarb patches whenever they have the chance to visit their family places, although there can be many years between visits. In one case, rhubarbs continued to grow without tending for over 15 years, although they were much smaller than they would have been with tending (Aunt Annie Evans 2015d).

Aunt Annie Evans explains how to tend a rhubarb patch:

You dig it out, like where there's weeds and grass and stuff growing. We used to say that could stunt the growth of the rhubarb. So you pull all that out and all the dried rhubarb leaves from last year. I'll dig it right out so there's only just the rhubarb growing up out of the ground. And they seem to grow really good after that [...] Where the patch of rhubarb is you go in and you pick them out here, and there and there and thin them out, and you pick the biggest ones. Then the smaller ones will grow better [...] Always take out the old leaves and all the old brown what's around them, and they'll grow better. Like, if I could get out there [West Turnavik] to do that now, next year they would have a better chance, cause I haven't been out there for two years now, I think, since I got out there (Aunt Annie Evans 2013a, 2013b) .

3.4.4.4 Fertilising

Soils in Makkovik are acidic and nutrient-poor, and require intensive amendments to produce vegetables. Kellup (seaweed) is regularly added to gardens to improve soil productivity: "In the mission house, when I worked there, we just got the kellup out off the beach and put it all over the garden, you know, and it went into the ground during the winter" (Aunt Annie Evans 2013a). Sometimes the kellup is smashed with a snow knife and mixed with sand before being added (Aunt Nellie Winters 2013a), and sometimes it is added in liquid form after kellup has been steeped in water (Charles McNeill and Jim

McNeill 2013). Formerly, some Moravian missionaries used human wastes collected in the “honeybuckets” as fertiliser in their gardens: “In the olden days, they had the toilets, cause there was no flush toilets, right? And especially Reverend Paul Hettasch and Katie [Hettasch] told me, they took the toilet out of the toilets, eh, and put it on the gardens. And you shovel it around, and dig it up with the spade, to move it all around. It would be a lot of work now” (Aunt Annie Evans 2013b). Uncle Jim Andersen also remembers this gardening practice in an interview with Makkovik historian Joan Andersen:

Yes, ma’am we did so have a garden... carrots, cabbage, potatoes, turnips, and oh, the greens, they were so tasty, just like they’re not even tasty like that any more now. Is they, I wonder. We never used fertilizer, but in the mission house, they would get their fertilizer from the barrels, the girls lavatory and the boys lavatory, and dip it out with a can with a handle on it. They would use that on it for fertilizer [...] That was the best of manure (Uncle Jim Andersen 2010).

In Makkovik, a garden does not only refer to something that has been planted. The word “garden” is used to refer to a secret place where an individual is likely to have good and consistent success with harvesting:

[I]t’s our little own patches that not a whole lot of people know about. So we’re kind of like, ok, this is our spot now, it’s our garden. Even a lot of the men here use that terminology, too, for when they go partridge hunting. If there’s a specific spot where they know that they can get a lot of partridges, that they don’t tell anybody about, they might’ve found it by accident or somebody might have told them years ago and they go check their [garden]. And it’s like an out-of-the-way kind of a spot, but they’re guaranteed to get their partridges they want. They always say that “I’m going to run up and check my garden [...] It is a public place cause anyone that finds it got access to it or can pick there. It’s just that they’re little out-of-the-way spots that people don’t normally go to, but if you go to it and you’re guaranteed to get stuff there then it’s your own garden (Carol Gear 2013a).

3.4.4.5 Wood girdling

Wooding is one of the most visible practices with plants in Makkovik, and the one that leaves an enduring footprint. Many homes in Makkovik burn wood as their primary fuel

source, and wooding also supplies fuelwood for cabins, as well as lumber for construction and woodworking. There is no great scarcity of wood for cutting around Makkovik, but there is now more harvesting pressure focused on a smaller area. As a result, most of the easier spots to wood nearby Makkovik have been cut out, a result of many families now living in the town of Makkovik rather than in smaller and more dispersed family places as was previously the case (Todd Broomfield 2015a).

Trees are sometimes ringed or girdled to create standing dry wood, especially large juniper trees (*Larix laricina*), which are especially valued as a slow-burning wood. To ring a tree, a cut is made in the bark as low as possible on the trunk, and the bark is removed in a circle around the tree. The best time to ring a tree is in June, when the bark “peels off like a banana” (Todd Broomfield 2015a). It is more difficult to ring a tree in the winter because “the bark is tight to the trunk” (Todd Broomfield 2015a). In the past, juniper bark was taken off the tree and used to roof fishing stages. After the bark was harvested, the tree would die and could then also be harvested for firewood. Large juniper trees were primarily valued for their bark, and the drywood was a secondary benefit (John Winters 2015b).

3.4.4.6 Other harvesting and ecological effects

Some Makkovimiut harvesting practices may promote plant productivity and plant health. Uprooting individual rhizomes of saltwater grass (*Leymus mollis*) for eating effectively thins the patch, loosens and aerates soil, and mixes in surface soil nutrients. Harvesting roots in this way has been shown to increase size and quality in edible geophytes (Anderson 2005). Plucking individual blades of saltwater grass for grass

sewing may stimulate vegetative growth (McNaughton 1983, Hik and Jeffries 1990) and reduce thatch, an excessive amount of which has negative physical and biological effects on grass patches (McCarty et al. 2005). Picking the edible buds of tulligunnak (*Rhodiola rosea*) early in the season delays flowering, prolonging the edible vegetative growth stage, and promotes sturdier, more branched and vigorous plants (Raven et al. 1999). The spring harvest of uKaujak (willow buds) by pinching may promote bushier lateral growth and increase the size and nutritional content of shoots (Skarpe and Hester 2008). When asked if there were ever any concerns about overharvesting uKaujak, Aunt Annie Evans replied: “No, there was no question about that, cause there was only two families, I suppose, too, in Adlavik, eh. And as fast as you picked them they grew out again” (Aunt Annie Evans 2014a). Some Makkovimiut discuss the teaching that active berrypicking benefits berry populations:

I was told by the old people that the more you pick, they better they’ll grow. But I’ve been thinking back myself, I don’t know. Especially bakeapples, because if you pick every bakeapple I wonder if we take all the seed, you know? Will there be more to grow? But where I bakeapple-pick, usually I picks almost the same places I used to pick, but there’s always some. I don’t think you pick every one anyway. There’s always a lot that gets blooming, you know, blowed off. And not only people eats them, animals eats them (Aunt Nellie Winters 2014a).

Aunt Annie Evans addresses another important point about harvesting effects on plant communities: that they are small-scale and localised. Most plant management in Makkovik is linked with family areas, where families formerly lived in winter and summer homes (Aunt Annie Evans 2014a). Families moved to full-time residency in the town of Makkovik in the late 1950s as a response to mandatory schooling laws and family allowances introduced after Newfoundland and Labrador joined Canada in 1949. However, family places are still considered home, especially for the Elders who grew up

in distinct bays, bights, and islands. People travel frequently to their family places for fishing, hunting, berry-picking, and trapping, and each family's place is well-known to not just Makkovimiut, but to people in other communities, as well.

One of the reasons plants may have been considered unimportant to northerners is that they are a calorically minor part of the overall diet. However, many plants foods are very rich sources of vitamins and micronutrients, even in small quantities (Porsild 1953, Kuhnlein and Soueida 1992, Fediuk et al. 2002, Grivetti and Ogle 2000, Kuhnlein et al. 2006, Anderson 2011). Phytochemicals found in chewing sticks and casually-ingested plants have positive physiological health effects, particularly amongst peoples whose diets are high in animal proteins and fats (Johns et al. 1996, Johns 1999). Snacking on diverse plants in small quantities may therefore be a seriously undervalued contribution to a healthy diet (Anderson 2011), particularly in northern regions. Looking for the signatures of “nutrition by nibbling” in the plant record may be difficult because of the small quantity of the harvest, the fact that harvesting is very dispersed (Beckwith 2004), and that harvesting practices may not be highly visible to visiting researchers (Anderson 2011).

3.4.5 Caring/managing for ecological values

Plant management in Makkovik happens at the scale of individual plants: tending rhubarbs, fertilising with kellup, transplanting mint. Plant management also happens at larger scales in Makkovik. Harvesting decisions at the landscape-level manage for particular ecological values that are important to Makkovimiut.

3.4.5.1 Water quality and fish habitat

While wooding, Makkovimiut generally avoid clearcutting next to rivers and shorelines: “Usually I’d go with John and he picks out the spot, and it’s usually pretty far away that we go. Not right on a riverbank or a brook bank, but further in” (Joan Andersen 2014). In Makkovik, it is well-recognised that sawdust adversely affects water quality and fish habitat (Charles McNeill, in Charles McNeill and Enid McNeill 2014; Todd Broomfield 2015a). Wooding away from rivers also protects riverbanks from erosion: “The tree, the roots hold the soil and you want to leave them, you want to make sure the brook water is protected” (Joan Andersen 2014). Since riversides such as Big Brook, Pomialuk and Makkovik River are excellent places to find the biggest and straightest trees for sawlogs, trees along rivers are only selectively cut as needed (Todd Broomfield 2015a). Cutting wood into logs is not allowed on the beach, also for reasons of water quality (Charles McNeill, in Charles McNeill and Enid McNeill 2014). Certain areas near town have been physically gated-off to motorised vehicle traffic (four-wheelers and snowmobiles) and wooding access to protect Makkovik’s drinking water supply (Todd Broomfield 2015a).

3.4.5.2 Wildlife

Hunting and trapping continue to provide essential food and livelihood for Makkovimiut. Managing woods for healthy wildlife populations is therefore very important. Wooding is usually done away from family places to reduce disturbance to local wildlife; if not, there are repercussions:

Aunt Annie Evans: One of my in-laws told me, there was some people staying with them in Ben’s Cove, and they cut wood not too far from the house across the way. And she said her Daddy, he was cross. He said the partridges are going to be cold now. And I think he meant, too, that they would go somewhere else, eh.

E. Oberndorfer: So there's some areas that people would prefer not to have cut?
Aunt Annie Evans: Yeah, like around the house, around the place. You always went off and got wood (Aunt Annie Evans 2014a).

The ecological values that must be respected while wooding can make it challenging to find a good spot to cut wood near family places: "There's only certain places where I can go for wood. All up the side of the brooks and stuff we don't cut at all, because I leaves it for partridges and the trees is all pretty" (Charles McNeill, in Charles McNeill and Enid McNeill 2014). Maintaining woods for habitat is not only important for wildlife, but for ensuring windbreaks and shelter around homes and cabins (Aunt Annie Evans 2014a).

3.4.5.3 Forest health

Wooding practices must support forest health and regrowth. Makkovimiut cut wood paths in order to access suitable wooding areas by snowmobile. Wooding areas are usually clearcut on a small scale in order to mimic natural forest disturbances and encourage forest regrowth: "If you're just cutting your firewood you try to clearcut [...] Just cause you clear that one area and then it's ready to start growing up again" (Charles McNeill, in Charles McNeill and Enid McNeill 2014). Even within these small clearcuts, not all trees are harvested. Small trees are left to allow the forest to regrow: "You don't go for the real small stuff, you let that grow up to be big [...] [Y]ou got to have some new trees" (Charles McNeill, in Charles McNeill and Enid McNeill 2014). Forest health is encouraged by careful harvesting that makes use of everything that is cut: "You shouldn't cut down trees and leave them there. Some people cuts down trees and only takes the biggest part of the tree, and leaves the small stuff. I take every part that's big enough to burn" (William Ford 2015).

As Makkovimiut have moved to Makkovik on a full-time basis, wooding pressures in the immediate area of town have become greater, and treed areas have also been lost to town development and infrastructure: “[Moravian Woods] is the last place where the trees is left, I think. There was all trees here [...] Where the store is there was a pond, and that was surrounded by thick trees when you went out to the pond, eh. Now there’s no trees right up past the school and farther, eh” (Aunt Annie Evans 2014a). Protected areas such as the Moravian Woods are valued as wildlife habitat, as an area for recreation, for aesthetic reasons, and as a link to the town’s Moravian history. Wooding and development bans in the Moravian Woods are well-respected (Todd Broomfield 2015a), as are wooding bans at individual family places, where Elders traditionally determined rules for cutting and protecting trees (Charles McNeill and Jim McNeill 2013).

3.5 What we learned, PART C – How plant practices shape Makkovimiut

3.5.1 Caring/managing for cultural values

If you ask someone in Makkovik if there are rules around wooding or berrypicking, the answer is usually “no.” People are free to harvest plants anywhere they like. But if you start to compile the unspoken conventions relating to plant harvesting, you begin to see that there are community rules that guide these practices. Some harvesting rules in Makkovik have an ecological underpinning, as described in the previous section. Many of these rules have a social underpinning, and reveal how wooding or berrypicking should optimally be done in ways that show respect for neighbours.

It may seem unusual to outside observers that such important rules governing harvesting practices are unwritten and often unspoken. However, long-standing practices

around common activities that are well-entrenched in day-to-life are often followed as routine; their cultural or ecological significance is not dwelled upon because the modes of practice are so ordinary to practitioners (Fowler and Lepofsky 2011). As was explained by Mary B. Andersen, “we’re not used to having to explain things that are just second nature to us” (Mary B. Andersen 2014). Mary B. Andersen elaborates that “there are no written rules because you’re just aware of it. For wooding, anything. If you see someone is hunting nearby you’ll go on. It’s the same with trapping. You don’t have rules because you just automatically give people their space. We just pass on what we know” (Mary B Andersen 2016).

3.5.1.1 Respect for family places

Makkovimiut respect the traditional family places of others by not harvesting there without permission. These family areas are well-known to Makkovimiut and to people from other communities, and they are still “home” to families who live full-time in Makkovik. It is up to the families of each place to care for their area, including its plants: “Where you got your cabin, that’s your responsibility to care for it, eh. And like Ben’s Cove, now, not many people what goes other places would go there and pick bakeapples. That still goes. They still leaves that” (Annie Evans 2014c). Harvesting around someone else’s family place would be considered very disrespectful: “You wouldn’t go into someone’s backyard, basically, which is what that would be, and go pick berries without asking” (Andrea Hoyt, in Frank Andersen and Andrea Hoyt 2013). Similarly, people would ask before setting traps in a family place, even if that trapline had not been used in a long time:

[S]ay if you're going off and you're going to be trapping, you know ok, this family has trapped in this area for generations. If you want to go and set a trap there because they haven't been using this area in four or five years, you're not just going to go and take over that ground. You're going to have the decency to go to the family to say, "I'm doing a new trapline. Can I set my traps here, would you mind?" And it's only more or less like... they don't own the land, they don't have the authority to say no, you can't. But it's out of respect for the family (Carol Gear 2014).

Fishing berths are also known to belong to certain families:

And even for the nets, to put out the trout nets. People in Postville have asked me or asked [my son] Tommy, because we're not there all the time, eh, and that's a good place for salmon and char. They'll ask Tommy or ask me, can I put a net there? And like we'll always say yes, put your net there, eh. But just the fact that they would ask us means a lot to us, eh. Means a lot (Aunt Annie Evans 2014b).

Harvesting decisions that ensure family places are respected demonstrate respect for the lands of others. This respect shown by neighbours for family places is very deeply appreciated by Makkovimiut. This respect is so important that younger generations are also aware of the family places of others, even though they have not lived in these places in the way of their parents and grandparents. Aunt Annie Evans talks about the respect that younger people have learned for her family place at Ben's Cove:

I was kind of touched one time when I was working for the LIHC [Labrador Inuit Health Commission] then, and we had youth group. And Lena, Katie and Brian's daughter, Brian McNeill, she was telling me how they was coming from Island Harbour and they seen the beaver in the pond, Ben's Cove pond, eh.... And she told me they watched it swimming. And she said, "Daddy said we're not going to get that because that's Rupert's" [Rupert McNeill, Aunt Annie's husband]. You know, I was really kind of touched... And he told her that, eh. Because he learned that from his parents, too. Cause Ben's Cove Pond is close to Ben's Cove (Aunt Annie Evans 2014b).

Even within Makkovik, it is well-known where Elders had their berrypicking spots.

Makkovimiut would avoid harvesting berries in these particular places out of respect for

neighbours: “For example, Ellen’s Barren Park. That’s where Aunt Ellen used to go pick some of her berries” (Frank Andersen, in Frank Andersen and Andrea Hoyt 2013).

Other places near Makkovik are considered more as shared public places and wooding is not done in these places by implicit agreement. People don’t regularly harvest close to town unless they are in great need of wood, or unless it’s hard for them to access wood otherwise (Todd Broomfield 2015a). This sometimes happens in the fall when a lack of snow makes it difficult to go off and get wood from other areas (Todd Broomfield 2016). Moravian Woods is formally recognised as a protected area by the Makkovik Inuit Community Government and Makkovimiut do not cut wood there. These informal and formal rules around wooding in Makkovik help to preserve community forests and the aesthetic of the community.

3.5.1.2 Respect for the work of others

Just as they respect the family places of neighbours, so too do Makkovimiut respect the work of neighbours. To harvest wood, Makkovimiut first cut a wood path, a trail wide enough to accommodate snowmobile and komatik (sled) that leads to an area of woods (a “droke of woods”) suitable for cutting. Enid McNeill discusses the very strong unspoken rule in Makkovik that harvesters respect the woodpaths of others:

If you cut your woodpath, then the first person who comes along who is disrespectful says, “Oh, must be some wood in here!” They don’t take your pile of wood that you’ve cut, but they might just cut the rest. And it happens. That’s disrespectful. I think that’s disrespectful... That’s something you would certainly teach your children not to do. Try to respect if you went in and saw somebody else was starting to cut, you just move on to somewhere else (Enid McNeill, in Charles McNeill and Enid McNeill 2014).

Relatedly, it is considered respectful to leave juniper trees (*Larix laricina*) that have been

girdled so that the person who prepared the work can return to harvest the tree (Todd Broomfield 2015a) .

3.5.1.3 Care for Elders and neighbours

Harvesting decisions show respect for the family places and work of fellow community members, generally. There are also harvesting decisions that reflect particular care for Elders, and for people who are not able to travel very far from Makkovik for their harvesting.

Out of respect for the reduced mobility of some Elders, Makkovimiut try to leave nearby and easily accessible berrypicking spots for those who need them: “There were berry patches that you weren’t supposed to go to because it was usually the elderly ladies in town would be taking those areas. So, you know, you’d leave them for them” (Frank Andersen, in Frank Andersen and Andrea Hoyt 2013). If people have the ability to harvest further away, they will leave nearby berrypicking areas for others in Makkovik: “I knows people goes and picks [berries]. So, as long as I can go and get them somewhere else, I will” (Aunt Annie Evans 2014b). Decisions around harvesting not only take into consideration ecological and aesthetic values; they also strongly include factors such as the age, mobility, and resources of neighbours:

Well, you kind of looks at it, well, it’s good for cutting here, but I can afford to go farther. I’ll leave that for people with a smaller skidoo or people with lower income that can’t really afford the gas. So, I won’t bother with this, I’ll go on farther. I can afford to go farther... You always have to think about other people... [That applies to] pretty well everything, yeah. Berries, and even birds, or seals, or anything. (Charles McNeill, in Charles McNeill and Enid McNeill 2014).

Makkovimiut will help their neighbours access harvesting places by assisting with

transportation:

If you're going off for a day berry-picking, a lot of times you'll offer rides to take people that you know don't have a boat, they don't have a skidoo like in the spring to go off. So they might want to go off and get a load of wood. And I know a lot of that happens even in Makkovik, where somebody might have a machine but they can't really afford to buy the gas steady to go get wood, or their chainsaw might be broke down. So you kind of take them off with you. They'll help you get your wood, you'll help them get a load of wood, so you're kind of like helping each other that way. A lot of that goes on. Same thing with picking berries. People that don't have boat catch rides with others and really enjoy it and are thankful for it, that they actually got to go and do that (Carol Gear 2014).

Harvesting decisions must also consider harvest quantity. Makkovimiut will harvest more than they personally need in order to share with family and neighbours, especially those who cannot harvest on their own: "If there are lots of berries and you can pick lots, you're thinking of other people who don't get to go off. We're always doing that and we're always telling our kids that" (Mary B. Andersen 2016). Makkovimiut will call Elders during winter to make sure they have enough berries (Aunt Ellen and Uncle Harold Andersen 2014) and share with those who don't have enough. Aunt Annie Evans describes how extensively berries are shared:

A lot of people gives berries and bakeapples, too, to people who can't get out. A lot of people here does that. I know last year Blanche Winters brought me a gallon of redberries. And she's given Hilda, my sister-in-law, bakeapples, eh. And I do give my sister-in-law bakeapples, too.... Here where everybody knows everybody, everybody knows the people who always had berries but can't get out to get them now. I think everybody knows (Aunt Annie Evans 2014b).

Knowing who to share with is made possible by strong relationships within the community. Sharing helps to reinforce those relationships, and shows love and care for neighbours. Elders are often recipients of shared berries, but Elders share as much as they receive: "Give what you can give. I mean, not only think about yourself. Give to people

that can't get it" (Aunt Nellie Winters 2014b). Sharing plants in Makkovik is part of showing active care for your neighbours. In fact, sharing plants is such an important part of life in Makkovik that ideas around overharvesting are linked to how well you share: "There have been some cases that some people have thought that others have taken way more [berries] than they needed or should have, especially if they didn't see them sharing" (Frank Andersen, in Frank Andersen and Andrea Hoyt 2013).

From the time a berry is picked, shared and shared and shared again, baked into pie, and brought to a community supper, it has quite possibly encircled all of Makkovik. It is through active practice of respectful relationships with plants that Makkovimiut support respectful relationships with neighbours, and manage for cultural values. Practicing the unwritten rules that guide plant harvesting knits together a strong and caring community. People-plant relationships are not only reciprocal, but circular.

3.6 Hearing the voices of plants

It is through active practice that people hear the voices of plants. Aunt Annie Evans gives the example of wood carving as a practice that allows people and plants to communicate with one another: "My brother-in-law in Hopedale, Chesley Flowers, he was like a famous carver, eh. And he said when he got a good piece of wood for carving, you smile eh, it smiles back" (Aunt Annie Evans 2014b). Aunt Annie Evans also speaks of plants as part of the family and as a part of family places (Aunt Annie Evans 2014b). Berry picking is a practice through which people come to understand that plants are alive and have feelings: "When you go out to the spots of bakeapples, you're so glad to see them, you know you can almost feel that they're glad, too" (Aunt Annie Evans 2014b).

Aunt Nellie Winters reflects on whether plants have feelings: “I thinks everything’s got a feeling. We just don’t know. Anything what can’t say, we don’t know, right?” (Aunt Nellie Winters 2014a). Carol Gear speaks about how plants and animals can be both happy and sad depending on how they are treated by people:

If you see, say, a beautiful caribou and it’s there in all its glory, and then it’s harvested, and then half of it goes to feed a family, then you could say half of that caribou is happy because it’s served its purpose. You know, you see happy faces, people around the table, they’re eating, they’re feasting, and this is what it was intended for. But then on the other flip side, the other half may have been spoiled, you know, and two years later it’s all freezer burn and thrown on the dump. Like, that’s the part that’s sad. I think animals and plants have a happy side and a sad side, but it really depends on the context. [...] A lot of people run out of berries really, really fast, so in my mind I think berries are very happy! (Carol Gear 2014)

Plants can communicate with people, but only if people are engaged enough to hear them. This is especially true when plants are trying to send people a message about the kinds of disrespectful behaviours that put people-plant relationships in jeopardy:

There’s also times when you go off and if you see where like there has been a lot of, say, ATV use and all this and that, and you see the sad shape of the area, you know. In your mind, like some of those... I don’t know, it’s just for me, like I see, ok this is a whole family. It’s a whole family of whether it’s bakeapples or redberries, they’re growing on the marsh, they’re right happy. And then they look so happy when they’re going to go into jam and stuff. You’re just like, yes, look at my redberry jam I’m so proud of. But when you see the destruction of the land and you see the places where berries haven’t come back, or areas that have been contaminated... I mean, if you can’t get a story out of that, or if you can’t see what’s being said to you, that’s only because you’re not prepared to take responsibility, or you’re not prepared to say that these areas need to be protected - if you can just walk away and ignore it, then you’re not listening (Carol Gear 2014).

Hearing the voices of plants is linked to taking responsibility for your actions, and being respectful in your relationships with plants. Disrespectful behaviours towards plants are not common in Makkovik, but they do occur. Some of the disrespectful behaviour is

linked to uncertainty. There is always some degree of uncertainty about the health and abundance of berries from year to year, for example, due to natural variability in weather and climate. Variability in the abundance of berries, fish, birds, and animals is recognised as part of a natural cycle. A less manageable kind of uncertainty comes with sudden losses of harvesting areas from town development, and damage to harvesting areas from motorised vehicles:

The scary part about it is that a lot of development happens without you really knowing about it. I mean, I mentioned before those antenna things went up on the hill. People, a lot of senior people and elderly people used to walk up on the hill to go berrypicking up there. Then all of a sudden this blinking red light is up on the hill. What's that? There's a big tower up there. We didn't even know it was going up there. And I know when the town has got a right to do their expansion work. I know a lot of people said after the fact, they blasted our redberry spots and they didn't even tell us about it. There should always be consultation with the community [...] You don't get rid of things that they're there for a purpose. In every community or every area, things are there for a purpose. They were put there for a purpose. They're serving their purpose. And people that don't believe me, I mean... If you go and cut down all these trees now on the road by Oukie's, you're guaranteed everybody along that would be flooded out in the spring, right? To some people it may be an eyesore, or it's like, oh my God it's really scary when there's bears around cause you don't know if they're in there or not, but they're there for a purpose. And any landscaper or any developer anywhere will tell you that (Carol Gear 2014).

Some plants are no longer harvested because of concerns over contaminants in town such as dog excrement, gasoline and oils. In particular, it has become difficult to harvest traditional spring plants. During spring, ice conditions make it dangerous to travel by snowmobile or boat to family places, where early spring plants were for many years a welcome fresh plant food that families looked forward to after long winters (Aunt Annie Evans 2015b). Due to concerns over contaminants in town and the danger of travel at this time of year, many spring plants like uKaujak and tulligunnak are no longer widely harvested.

The uncertainty of losing harvesting areas is coupled with other factors that affect the harvesting opportunities for Makkovimiut, such as weather, full-time employment, and the high cost of fuel:

When you look at the community as a whole, a lot of people in Makkovik are working fulltime jobs. So there have been times when they've put in leave requests because they're planning on going southward way, they're going to go and get their quota for their geese. You know, like they're really happy about it, and then they get off and then as soon as they get there the weather comes down. It's no good, they can't get out in boat, they can't harvest anything, they come back, their time is used up – out of luck. And then there's other times that they go off - or they don't even get to go off. They get their leave approved and weather comes down and you don't get away from the docks (Carol Gear 2014).

When uncertainty about the landscape is combined with harvesting limitations, people may feel pressured to harvest in disrespectful ways (Frank Andersen and Andrea Hoyt 2013; also see Karst 2002):

Even around town, you got a couple spare hours, you think, ok, I'm going to go over here a bit and see if the bakeapples are ripe, because there's a couple little hotspots that you know of that nobody's discovered. The last few years it's been very discouraging, because you find out as soon as the bakeapples grow up, they're not even ripe yet and people are going along and they're picking them when they're hard to take them home to ripen. Like, they're not even given a chance to mature. That and global warming, it's really annoying. But I think it's because people realise that a lot of areas are being destroyed. Places that you could go and get bakeapples before, you can't anymore. Same thing with redberries. You know, when they built that new subdivision, a lot of the rock was blasted away over there, and that was prime berrypicking area. So I think now, same thing with the overharvesting on birds and things like that, you've got people that are going in there and before they might have only needed, like, two gallons - now they're going to pick four or five, whatever they can get, because you know there might not be any next year. So they're trying to hurry up and pick what they can. And then, you know, even if they only use two and a half gallons this year and then nothing blossoms next year, you still have some into the next year (Carol Gear 2014).

Carol describes her reaction to seeing an area where bakeapples (*Rubus chamaemorus*) were harvested before they were properly ripe:

There's two ways you could look at it. And the way that I look at it first, I thought, oh my God, they're just greedy and disrespectful, like what's the meaning of this? But then if you've encountered it before, and then realise in the long run, hey, they were smart to do that because nothing grew the next year. Or you might have a whole lot of bakeapple plants growing but nothing is coming out of them.... There wasn't enough rain, or we might have had a ton of lightning so that there were a lot of berries there, but now they're all blighted, they're no good anyway. So there's a lot of different reasons why there wouldn't be like a bountiful harvest. Not only because of that, but like I said, there's just so many different things that can contribute for you not having a good year to be able to harvest things (Carol Gear 2014)

Ensuring local, accessible, safe, and enduring harvesting areas is critical to ensuring continued plant practices for Makkovimiut. These harvesting areas need to be available not simply to access the plants themselves, but for ensuring the vitality of the entire web of interconnected relationships: cultural practices, aesthetic values, opportunities for teaching and learning, and the active expressions of care for neighbours and community. Given the role of Makkovimiut in creating cultural landscapes, cultural practices should also be acknowledged and supported for their role in maintaining current plant communities. If cultural practices change, so too may plant communities. Local land use planning needs to respond to community priorities of safeguarding harvesting areas and supporting the active practice of people-plant relationships:

I mean you can't help development, but you can be protective and you can do it responsibly, you know, so that areas even though they're developed you're still living close to nature, and you're still in harmony. And this is probably why, years ago, where the town was starting to grow, the Elders said do not cut the Makkovik Moravian [woods], you know, we're leaving our woods back there. You don't develop that. Whether it was because it was a great place to go in partridge hunting, or it's a great place for little rabbits running around, or for whatever reason. I guess you just didn't want to come in the harbour and see it's just rock, rock and houses. A lot of places are like that (Carol Gear 2014).

If we appreciate how critical plants are to cultural practices, to human health and well-

being, to ecological values, and to supporting actively practiced respect and care for neighbours, we will take a closer look at how land use planning can effectively protect plants and the cultural practices that sustain plant and human communities:

Plants give us everything: food, shelter, well-being, heat. They protect the soil from erosion. All medicines come from plants, even if people think they're made somewhere. That understanding is getting lost now. You don't realise it until you think about it how much we depend on plants. It would be pretty bleak if you never had plants. Plants are so important in the food chain. Without plants, what would we have? We wouldn't have very much (Mary B. Andersen 2015a).

3.7 “Tell them about our plants”: Concluding thoughts

In 2015, as we were thinking about writing a conference abstract, Erica asked Makkovimiut plant mentors what they wanted us to share about plants in Makkovik at this conference. Aunt Ellen Andersen said, “Tell them about our plants.” When Erica asked, “Which ones? What’s most important that I share?”, Aunt Ellen Andersen replied, “All of our plants, what we have, any of them. They’re all important” (Aunt Ellen Andersen 2015). Plants are important not just as individual objects. They are important in the context of all their relationships. Plants are personally meaningful to Makkovimiut as links to place, memory, and history. They facilitate learning and promote well-being. Plants are critical to cultural practices, such as fishing, which in turn support plants. Relationships with plants guide harvesting practices, and protect ecological values like water quality and wildlife habitat. Caring for plants helps to structure plant communities through selective harvesting, transplanting, fertilising, and tending. Putting relationships with plants into practice not only shapes plant communities, but helps Makkovimiut shape an interconnected human community, where harvests are shared and harvesting decisions take others into account. When we assign plants to categories like food,

medicine and materials, and consider plants as isolated and individual species, we put up conceptual walls that obstruct our view of plants in relation. Categories of use are ill-equipped to help explain why, as Aunt Ellen Andersen says, all plants are important. This is where the stories Makkovimiut tell about plants can offer meaning. Within the stories are the worldviews, values and unwritten rules that speak to how respectful relationships with both plants and people can be practiced, as part of a larger web of relationships. If one of the goals of research is “learning, so as to enhance the well-being of the earth’s inhabitants” (Kovach 2009, 102), then it is in the stories Makkovimiut tell about plants that learners will find a very different model to guide our own relationships with human and ecological communities - and perhaps help us understand the codes of behaviour that will allow us, too, to hear the voices of plants.

4 Chapter: The stories plants tell about people – Ecological footprints of fishing practices near Makkovik

4.1 Introduction

In 1992, William Denevan wrote about the problematic “pristine myth”, the persistent view that Indigenous peoples lived so lightly on the land that they left virtually no ecological footprint. In subsequent years, many landscapes that were once believed to be untouched wilderness—the forests of the Amazon and Mesoamerica, the meadows of the Pacific west coast—were shown to not only bear evidence of human activity, but to have been intentionally shaped and maintained by Indigenous peoples (Balée 1989, Balée 1993, Deur 2000, Deur 2002, Heckenberger et al. 2003, Beckwith 2004, Anderson 2005, Deur and Turner 2005, Balée 2006, Heckenberger et al. 2007, Campbell et al. 2008, Ford 2008, Turner and Turner 2008, Ford and Nigh 2009, Ross 2011, Ross and Rangel 2011). In many cases, enduring changes in plant community composition help tell the ecological story of people and their relationships with landscape (Anderson et al. 2011). Plant communities similarly attest to the ecologically transformative power of non-intentional human interactions with landscape, such as in the unique flora of shell middens (Lombardo et al. 2013, Cook–Patton et al. 2014, Vanderplank et al. 2014).

Land use legacies in northern regions have received attention in the boreal forests of Europe, particularly Fennoscandia, where it is now recognised that Indigenous peoples have had lasting effects on forest communities (Segerström 1997, Uotila et al. 2002, Joseffson et al. 2009, Joseffson et al. 2010, Hörnberg et al. 2015). Research in the Canadian North has looked at how Inuit whaling practices have created lasting ecological changes in freshwater ponds (Hadley et al. 2010a, Hadley et al. 2010b, Michelutti et al.

2013), and how Inuit shape terrestrial plant communities through soil enrichment, disturbance and harvesting (Lutz 1951, Porsild 1955, McCartney 1979, Forbes 1994, Forbes 1996, Derry et al. 1999, Lemus-Lauzon et al. 2012, Roy et al. 2015). Despite this work, a historical narrative persists that casts northern regions as untouched and often unpeopled places (Jørgensen and Sörlin 2013). This perception is particularly puzzling for places like Labrador, which has not only thousands of years of Indigenous history, but where there are also centuries of documented European commentary on Indigenous peoples in the region (Markham 1877, Stephens 1890).

As part of the process that established the Nunatsiavut Government and the Labrador Inuit Land Claims Area, Inuit in northern Labrador have documented their own history in the publication “Our footprints are everywhere: Inuit land use and occupancy in Labrador” (Brice-Bennett 1977). The title of this publication makes clear that Inuit footprints are visible throughout the region. This assertion is not just figurative: tent rings, sod houses, inuksuit (plural of inukshuk/inuksuk, a stone marker; Larkham and Brake 2011), quarries, fishing berths, gravesites, summer and winter homes, and trails are just some of the physical markers of a long-term Inuit presence in Labrador.

As in other regions, plants and plant communities in Labrador also serve as indicators of human footprints, and as markers of human practices. Early European visitors to Labrador such as English trader George Cartwright remarked upon the changes in vegetation at sealing posts, as well as at Inuit sod homes and codfishing stations along the coast: “All the old encampments of the Esquimaux, point themselves out to you on sailing along the shore. And the south-west point of Great Island, on which I had a cod-

fishery for three successive summers, is now covered with grass, where nothing but heath formerly grew” (Cartwright 1792, 238).

As well as being home and thoroughfare for early Indigenous peoples and their descendants—represented today by Nunatsiavut Government, Innu Nation, and NunatuKavut Community Council—the Labrador coast has been a place of commerce for European, American, and Newfoundland seasonal fishermen, whose boats would visit Labrador each summer to fish for codfish. The waters of northern Labrador saw extensive traffic from large commercial fishing enterprises. In the heyday of the codfishery, upwards of 20,000 people would come seasonally to northern Labrador to fish from schooners and summer fishing stations on offshore islands, and another 20,000 people fished on the Southern Labrador Straits (Chimmo 1868). The scale of the fishery along the coastline of present-day Nunatsiavut has therefore varied dramatically between large commercial enterprises and smaller family fishing places. Related impacts on shoreline vegetation through construction of seasonal homes, bunkhouses and stages have also varied in space, time and scale.

This chapter looks at some of the ecological stories plants tell about people through the plant communities of fishing places near the Inuit Community of Makkovik (Nunatsiavut, Labrador). We consider if plants and plant communities can tell ecological stories about the fishing histories of Makkovimiut (residents of Makkovik), and about other fishing histories in the region. A focus on the plants of family fishing places stems from the community research priority of learning more about the plants of family places (Appendices A-F). Family summer homes were first and foremost located at good fishing areas, that also had serviceable harbours and fresh water supply. These family fishing

places have had sustained seasonal human impact for many generations. Along with commercial fishing stations, these family fishing areas are likely to have experienced some of the most long-term and substantial local human impacts in the region, which makes them ideal places to consider the effects of cultural practices on plants and soils.

We take an ecological approach to storytelling in order to tell a more complete story of the relationships between people and plants in Makkovik. The combined voice in this chapter recognises the collective efforts of Erica (PhD student), guide Todd Broomfield, committee member Jeremy Lundholm, and supervisor Gita Ljubicic to tell this ecological story. Developing and interpreting this ecological research has depended on the cultural knowledge of Makkovimiut. We cite individual Makkovimiut plant mentors to attribute specific knowledge used in planning and interpretation. All unattributed local knowledge in this chapter is contributed by co-author and guide Todd Broomfield. We use local Makkovimiut names for plants wherever possible in order to keep work accessible to readers from Makkovik (Table 1, and section 4.3). These local names may be different from other common names for these same species. For example, hemlock is the name in Makkovik for *Angelica atropurpurea*, which in other regions is called purplestem angelica or great angelica. In Makkovik, hemlock does not refer to the genera *Conium*, *Cicuta*, or *Tsuga*. Where there are no known local names for plants, we use scientific names for these species. We also include an explanation of statistical methods towards making methods and results more accessible to readers.

4.2 Methods

4.2.1 Cultural-ecological context

Makkovik is located in a region that has been inhabited for thousands of years by Maritime Archaic, Paleoeskimo, and Thule peoples (Kaplan 2012). Present-day Makkovik was established as a town in 1860 by Torsten Kverna Andersen, a Norwegian immigrant, and his wife Mary Ann Thomas, who came from Makkovik Bay (Inuit Community of Makkovik 2013). Fur trading and fishing opportunities in the area attracted other Inuit families, settlers, and fishing schooners. Moravian missionaries built their most southerly Mission Station in Makkovik in 1898, and established a boarding school in 1915 (Inuit Community of Makkovik 2013). The Inuit Community of Makkovik (population 360, 55 degrees 07'N 59 degrees 03'W) is today one of the more southerly Inuit communities in Canada, and is one of five communities in Nunatsiavut (Figure 1).

Prior to the 1950's, families living in the areas around Makkovik moved between seasonal homes during the course of the year. In winter, families trapped and hunted from winter homes in sheltered bays, typically from October to June. Starting in June or July each year, families would move to their family fishing places in outer bays or on islands, where they fished for trout, char, salmon, and cod through the summer and fall. Gardens were often planted in June at winter homes and left to grow untended until families returned to their winter homes each autumn. By the 1950's, most families had moved to Makkovik on a full-time basis to be closer to their children in the boarding school (Aunt Annie Evans 2014a; Herb Jacque 2016). Seasonal harvesting practices including fishing, hunting, trapping, berrypicking, wooding, and egging continue both from the town of

Makkovik and at family places, where many Makkovimiut (residents of Makkovik) now have their cabins.

Today, fishing in Makkovik is a vitally important practice for food, as well as a commercial activity. Salmon, char and trout for family use are mostly caught by nets set close to town in nearby Makkovik Bay, or at family cabins and family berths within a few hours travel by speedboat from Makkovik. Codfish are currently caught by jigging in late summer and fall in the communal food fishery, but were formerly caught commercially in cod traps. The commercial codfishery in Newfoundland and Labrador was closed in 1992 when the Canadian government placed a moratorium on the entire cod fishery due to depleted cod stocks (Wappel and Canada 2005). In Makkovik, the closure of the commercial codfishery and the salmon fishery (the latter in two phases, 1992 and 1995) not only affected employment and seasonal activities, but also affects where Makkovimiut currently fish. Many traditional family places that were seasonal shore-based fishing homes during the commercial fishery have been shut down, including Roger's Harbour, Dog Island, Jigger Island, and Double Island. In the present day, commercial fishing in the Makkovik area operates from longliners, and focuses on snow crab and turbot (Greenland halibut). These species are locally processed at the Makkovik fish plant. The communal fishery is managed by Nunatsiavut Government, which holds and manages the licenses for this fishery.

Makkovik is located on the mid-Labrador coast (Environment Canada 2015). The average annual temperature is -1.3°C , with daily maximums averaging 17.2°C in the warmest month of August, and daily minimums averaging -20.8°C in the coldest month of January (Environment Canada 2015). Annual rainfall is 538.8 mm, annual snowfall is

411.4 cm, and annual average snow depth is 24 cm. Rain and snow are both unusually heavy for such a cold climate at sea level due to the presence of the Icelandic Low (Nature Conservancy of Canada 2014). The average frost-free period is 90 days (Environment Canada 2015).

Makkovik lies in the Makkovik Province Geological Zone (Wardle et al. 1997). Islands are predominantly granite and granodiorite, while some mainland areas are rhyolite, siltstone, sandstone, or basalt sandstone (Wardle et al. 1997). Soils are humo-ferric podzolic soils on loam, but many areas lacking soil are hard rock-acidic (Agriculture and Agri-Foods Canada 1995). Permafrost is discontinuous and occurs in bog peatlands (Nature Conservancy of Canada 2014). Recent Ecological Land Classification through the Newfoundland and Labrador Nature Atlas places Makkovik in the Taiga Shield Ecozone/Coastal Barrens Ecoregion/Hopedale Coast Ecodistrict (Nature Conservancy of Canada 2014). Forests are spruce-dominated and occur at lower elevation and in sheltered valleys, with boreal ground cover such as Labrador/Indian tea (*Rhododendron groenlandicum*), crackerberry (*Cornus canadensis*, *C. suecica*), twinflower (*Linnaea borealis*), and snowberry (*Gaultheria hispidula*). Upland areas and offshore islands are dominated by heath species, such as blackberries (*Empetrum nigrum*), redberries (*Vaccinium vitis-idaea*), bakeapples (*Rubus chamaemorus*), and backieberries (*Vaccinium uliginosum*).

4.2.2 Preliminary research design and interpretation

In 2012, we began learning about Makkovimiut priorities for research on people-plant relationships (Appendices A-F). From workshops and discussions in 2012-2013 emerged

a strong interest in documenting cultural plant knowledge, as well as learning more about the plants of family places. The broad mandate to better understand the plant communities of family places gained specific focus only after extensive discussions, workshops and apprenticeships with Makkovimiut plant mentors from 2012-2014. During this time, we also spent 28 days traveling with guides and plant mentors by boat to culturally important areas around Makkovik as part of our preliminary learning about individual site histories. Thanks to this extensive teaching by guides and Makkovimiut plant mentors, we learned how to look for possible plant signatures of land use practices, and from this learning developed more focused research questions and methods. The chronological sequence of learning—cultural plant knowledge precedes ecological research design—ensured that our research program originated with Makkovimiut, fulfilled community research priorities, and was guided by knowledge of local land use history and practices.

4.2.3 Research questions

To explore relationships between plant communities and family places around Makkovik, we focused our research on summer fishing places. The intensity of fishing practices in the region has varied from large commercial enterprises employing hundreds of people, to small family fishing sites, to sites where fishing is just one of a suite of diverse harvesting activities. These sites have correspondingly diverse elements in their built environments. Our questions were:

1) Are there site-level differences in plant communities at family fishing places, commercial fishing places, and mixed-use tent ring sites?

We anticipated that commercial fishery sites would show differences in plant communities from increased soil disturbance, nutrient enrichment from fish processing, and possibly higher incidences of introduced species. We anticipated that family fishing places and tent ring sites would have less disturbed plant communities and lower nutrient levels based on lighter human impacts at these sites.

2) Do different historical built environments at fishing places generate correspondingly different plant communities?

We anticipated that different built environments would have their own unique plant communities as a result of variations in nutrient inputs and soil excavation.

4.2.4 Ecological methods

Research occurred at nine primary sites, all of which were previously inhabited on a full-time seasonal basis (Figure 6). Each of the nine primary sites is associated with one of three site categories:

Category 1. Family fishing places: Tom's Cove (TOC), Ikey's Point (IKP) and October Harbour (OCH). These places were fished by Makkovimiut families before and during the commercial fishery, and nearby waters are still fished in the communal food fishery. Sites formerly had small houses and a stage where fish was processed. These sites

continue to be important family places, but there are no longer full-time seasonal residents as previously.

Category 2. Commercial fishing places: West Turnavik (WTU), East Turnavik (ETU), and Ironbounds (IRO). These sites housed hundreds of fishermen—and often their families—in houses, bunkhouses, and on schooners. These commercial sites had multiple stages for processing fish. Many of the fishermen were seasonal fishermen from Newfoundland. Makkovimiut also fished with these commercial crews and often prepared the sites prior to the arrival of the schooners each summer. For example, in the 1960's Tom Evans from Ben's Cove prepared the fishing areas at West Turnavik prior to the arrival of the fishing schooners by hauling firewood from the mainland, doing repairs to stages and houses, and preparing the nets (Aunt Annie Evans 2013b).

Category 3. Tent rings: Malona Point (MPT), Tupik Point (TPT), and East Turnavik Point (ETP). These sites are where the ancestors of Makkovimiut harvested birds, eggs, seals, shellfish, and fish from spring through fall. These sites were also used during travel and command excellent views of maritime travel routes, as well as views of migration routes for birds and sea mammals. Harvesters at these sites stayed in circular skin tents anchored by stones. There has not been sustained seasonal presence at these tent rings in living memory. Tent rings were selected as a “reference” site where there is a visible historical human footprint (i.e. stones intentionally placed in a circle) but where vegetation appears identical to surrounding heath vegetation.

The specific area affected by fishery activities differed at each site. To enable comparison of different sites, a roughly standard area was surveyed at each of the nine primary sites, between 1344 m² and 1523 m² (Table 4). In the case of large sites, this standardised area was centred on the area of greatest disturbance at that site. Site areas included a gradient of habitat types from shoreline to inland. Most of the disturbed areas occur at or near the shoreline, where the majority of fishing activities were located.

We also surveyed individual built environments at eight supplemental sites, in order to include more built environment plots in plot-level analyses (Figure 6; see section 4.2.5 and Appendix JJ for summary). These built environments were located at known sites in close proximity to the nine primary sites. At these eight supplemental sites, only individual built environment plots were surveyed, not the entire site area. Photos of all sites can be seen in Figure 7.

Figure 6 Map of the nine primary sites and eight supplemental sites

Table 4 Nine primary sites and their histories

Category 1 – Family fishing places	
Tom's Cove (TOC) 55.1228963, -59.185505 1344 m ² 7 plots	Fished by brothers Bob and Jim Andersen, and their sister Jessie, Uncle Mun (Alfred) Andersen, and Norman Broomfield from approx. 1965-80; Ned Parsons also fished here for a couple of years (Junior Andersen, pers. communication, 28 Jan 2016); a more recent fishing place, only started after the Andersen family moved from Adlavik to Makkovik in the 1950s (Toby Andersen 2015); one summer fishing house known to have been built here
Ikey's Point (IKP) 55.1492894, -59.1434676 1523 m ² 8 plots	Fished by Torsten Kverna Andersen (1834-1904) and his descendants; also fished by the McNeill, Jacque, Winters, and Perrault families in later years; a bunkhouse and four or five other houses were built here; two key cod trap berths were located at Trap Cove and Fitzgerald Cove; post-glacial rebound has raised the site at least 6 ft in the past 35 years, so that plants now grow where formerly the tide rushed through; at one time you could row across the site when the tide was high (Toby Andersen 2015)
October Harbour (OCH) 55.099805, -58.9654386 1382 m ² 6 plots	Fished by Aunt Annie Evans' Father (Eddie Andersen) and Grandfather (Harry Andersen), who had a summer fishing house there; Joan Broomfield's parents (John and Mildred Broomfield) also had a tent here around 1953 (Aunt Annie Evans 2016); this tent had a wood plank floor (Joan Andersen 2016); Walter and Emily Dickers also had a tent here (Toby Andersen 2016); a very exposed harbour

Category 2 – Commercial fishing places	
West Turnavik (WTU) 55.2517022, -59.3352404 1344 m ² 9 plots	Originally fished by the Evans family from Ben's Cove, as well as the Lyall and Ford families from Island Harbour (Aunt Annie Evans 2013b); a commercial fishing station was established on West Turnavik in the 1870's by Abram Bartlett of Brigus, Newfoundland; Abram's son William Bartlett continued the business on West Turnavik, employing over forty crews [a mix of small shore crews (at least 4 people), local family crews (4-8 people), small schooners (8 people), and big schooners (20 people); perhaps 500 people] (Todd Broomfield 2016); many fishermen slept aboard their schooners in the harbour, which were so densely anchored that they formed a bridge between neighbouring islands (Aunt Annie Evans 2016); buildings on West Turnavik included a cooper shop and a blacksmith shop (McNeill and Markham 1979); Bartlett's commercial fishing station closed in 1931
East Turnavik (ETU) 55.2861212, -59.3403411 1344 m ² 11 plots	A fishing station was established at East Turnavik in the 1880's by John Munn and Co. from Newfoundland, who supplied 10-15 crews (200-300 fishermen) along with Abram Bartlett; the fishing station was bought by William Hennessy in 1894, who operated it until 1912 (Poole and Cuff 1994); Hutchings also fished there with a crew from Newfoundland, who would fish by motorboat, with bunkhouses on shore (Annie Evans 2015d); the other side of the harbour was fished by McNeills and Lyalls from Island Harbour, who employed their own crew, and had a fishing room there (Sheppard and Markham 1977); older structures at East Turnavik include sod houses and a midden, located next to the former bunkhouse

Category 2 – Commercial fishing places (continued)	
Ironbounds (IRO) 55.1455444, -58.780519 1360 m ² 6 plots	Ironbounds was mostly fished by Newfoundland crews from Bay Roberts and Trinity Bay, including Skipper John Snow, Mercer, Halloway, and the Burrys (Andersen and Andersen 2007); crews managed by Jim Burry (skipper of the Sherman Zwicker), Austin Burry (logistics), and Jim Feltham (fishing skipper) were fitted out by owner Maxwell Burry from Glovertown/ Bonavista Bay; the Sherman Zwicker brought crews and supplies from Newfoundland to Ironbounds each summer, making multiple trips with supplies and fish between July and September (Toby Andersen 2016); on shore at Ironbounds there was a cookhouse, bunkhouses and family houses; there were an estimated 100 people fishing from shore, and at least 100 people fishing from schooners (Toby Andersen 2016); the fishing at Ironbounds is much better than at Turnaviks and number of crew working at Ironbounds would have been comparable to Turnaviks (Todd Broomfield 2016); previous to the Newfoundland commercial fishery, local families who fished at Ironbounds include Jacques from Lanse Ground, Broomfields, and Winters (Toby Andersen 2015)

Category 3 – Tent rings	
Malona Point (MPT) 54.9996671, -58.8695861 1344 m ² 4 plots	Malona Point and Tupik (“tent” in Inuttitut) Point were visited from spring through fall by local people who stayed in circular skin tents; nearby families who would have harvested there include the families wintering at their mainland homes at Seal Cove, Lanse Ground, Adlavik, and Big Bight (Toby Andersen 2015); Malona and Tupik Point are seasonal harvesting areas for seals, birds, eggs, and fish, and would have been stop-over places during travel (Todd Broomfield 2015a); also see Hawkes (1916)
Tupik Point (TPT) 54.9679106, -58.8566325 1344 m ² 6 plots	
East Turnavik Point (ETP) 55.2781128, -59.3318582 1456 m ² 6 plots	This site is known locally as the “Bunkhouse” because it is a small island adjacent to the larger islands at East Turnavik, similarly to how a bunkhouse is positioned next to the skipper’s house (Junior Andersen, pers. communication, 28 January 2016); this site has two tent rings similar to Malona and Tupik Point; tent rings have a clear view of the north-south travel route; the site was not likely to have been as busy as a harvesting area as Malona and Tupik Point, which are closer to larger settlement areas, such as at Long Tickle and the mainland (Todd Broomfield 2015a)

Figure 7 Photos of the nine primary sites and eight supplemental sites

Tom's Cove (TOC) – Category 1 site

Ikey's Point (IKP) – Category 1 site

October Harbour (OCH) – Category 1 site

West Turnavik (WTU) – Category 2 site

East Turnavik (ETU) – Category 2 site

Ironbounds (IRO) – Category 2 site

Malona Point (MPT) – Category 3 site

Tupik Point (TPT) – Category 3 site

East Turnavik Pt. (ETP) – Category 3 site

Long Tickle (ADL) – supplemental site

Tupik Point S (TPS) – supplemental site

Seal Cove (SEC) – supplemental site

Big Bight (BBT) – supplemental site

East Turnavik C (ETC) – supplemental site

East Turnavik N (ETN) – supplemental site

Indian Head (INH) – supplemental site

Top Garden (TOG) – supplemental site

At each of the nine primary sites, the entire surveyed area was divided into plots based on natural habitat features, evidence of built environment features (e.g. wood boards, stone walls, mounded sod walls, tent poles) and known site history (Appendix JJ). These plots were variable in shape and size, as they took their outline from the boundaries of these natural and built features. Plot types were defined *a priori* by vegetation type and substrate, after preliminary site visits and discussions with guides (Table 5, Figure 8).

Table 5 Plot type descriptions

Habitat type	Total no. plots	Built environment?	Description
Bog (BOGG)	1	No	Waterlogged peaty ground with ground cover of <i>Sphagnum</i> spp.
Conifer (CONI)	1	No	>60% tree cover, trees >2 m, dominated by spruce (<i>Picea</i> spp.), juniper (<i>Larix laricina</i>), and fir (<i>Abies balsamea</i>)
Grass (GRAS)	3	No	>40% grass, sedge and rush (graminoid) cover
Heath (HEAT)	6	No	Ankle-high vegetation; low-growing heath vegetation dominated by blackberry (<i>Empetrum nigrum</i>) cover
Inland rock (INRO)	7	No	Rock expands outside of wave zone, often higher elevation, with rock >50% of surface area; may be flat and level or contain areas of boulder; crustose lichens common; blackberry (<i>Empetrum nigrum</i>) usually present
Low herbaceous (LOHE)	5	No	Below-knee vegetation, dominated by crackerberries (<i>Cornus suecica</i>), beach pea (<i>Lathyrus japonicus</i>), alexanders (<i>Ligusticum scoticum</i>); not blackberry (<i>Empetrum</i>) heath
Low shrub (LOSH)	4	No	Below-knee woody shrubs, strongly dominated by willows (<i>Salix</i> spp.)
Pond (POND)	2	No	Mostly open permanent wetland with vegetation at margins, often sedges (Cyperaceae) present
Shoreline cobble (SHCO)	2	No	Rock cobble substrate with <50% vegetation cover, immediately adjacent to water; salt-tolerant species (halophytes) present

Habitat type	Total no. plots	Built environment?	Description
Shoreline grass (SHGR)	2	No	Grass dominated by saltwater grass (<i>Leymus mollis</i>), typically occurring on cobble beach, close to shoreline
Shoreline rock (SHRO)	2	No	Bare rock in wave action zone, with some halophytes
Tall herb (TAHE)	3	No	Above-knee vegetation, herbaceous and graminoid mix; bumblebee flower (<i>Chamerion angustifolium</i>) often dominant
Tall shrub (TASH)	2	No	Above-knee shrub zone, including willows (<i>Salix</i> spp.) and currants (<i>Ribes glandulosum</i>).
Garden (GARD)	5	Yes	Raised beds and/or fence posts still visible
Midden heap (MIHE)	3	Yes	Asymmetric mounded earth near sod houses or wood houses
Sod house (SOHO)	4	Yes	Rounded mounds of sod bordered by stone; former homes
Stage (STAG)	2	Yes	Shoreline area used for processing fish; beams and timbers from platforms and building often still visible
Tent ring (TERI)	5	Yes	Circle of large stones, often on inland rock or heath
Tent site (TESI)	2	Yes	Characterised by old hearth stone or tent poles
Unknown structure (UNST)	4	Yes	Any structure with intermediate characters (e.g. between round sod houses and rectangular wood houses with lumber remnants) or whose purpose is unknown
Wood house (WOHO)	12	Yes	Former rectangular wooden buildings, houses and bunkhouses, usually with lumber remnants (woody debris)

Figure 8 **Photos of the plot types**

Bog (BOGG) (East Turnavik)

Conifer (CONI) (Tom's Cove)

Grass (GRAS) (West Turnavik)

Heath (HEAT) (East Turnavik Point)

Inland rock (INRO) (East Turnavik Point)

Low herbaceous (LOHE) (Tupik Point)

Low shrub (LOSH) (Ikey's Point)

Pond (POND) (East Turnavik)

Shoreline cobble (SHCO) (October Har.)

Shoreline grass (SHGR) (East Turnavik Pt.)

Shoreline rock (SHRO) (East Turnavik)

Tall herb (TAHE) (Ironbounds)

Tall shrub (TASH) (Tom's Cove)

Garden (GARD) (Seal Cove)

Midden heap (MIHE) (Long Tickle)

Sod house (SOHO) (East Turnavik)

Stage (STAG) (West Turnavik)

Tent ring (TERI) (Malona Point)

Tent site (TESI) (October Harbour)

Unknown structure (UNST) (West Turnavik)

Wood house (WOHO) (East Turnavik)

4.2.5 Vegetation sampling

We recorded all plant species found within each plot at all of the nine primary sites. There were 63 plots across these 9 primary sites. To make plot-level comparisons more robust for built environment plot types, we also recorded species found at an additional 14 plots at 8 supplemental sites, where there were known built structures (Figure 6; Appendices W-JJ). In total, we surveyed vegetation at 77 plots. The total area of each plot was estimated by pacing (Appendix KK). From July-September 2014, we exhaustively surveyed each plot for vascular plants, all of which were identified to species level. We visually estimated percentage cover of each species for the entire plot area (Helm and Mead 2014). Species names are given first in local names, and then follow scientific nomenclature from the Database of Vascular Plants of Canada (VASCAN 2015). Species frequency refers to the number of times a species is encountered, and is based on the presence/absence of a species within a plot or at a site, rather than on estimates of spatial area covered. Common species are therefore species that are encountered more frequently, without any spatial component attached. Species abundance specifically refers to the spatial coverage of a species over a given area, and is based on observations of species percent cover.

4.2.6 Independent variables

Because plots such as “heath” or “inland rock” could be quite patchwork over a site, we took measurements at three locations within each plot in an attempt to characterise the plot’s average conditions. For plots in habitat types that tended to be large, we took measurements at the three largest patches of that plot type that were spatially separate.

For known anthropogenic plots such as wood houses, we chose three separate and representative sampling points at those plots (i.e. near, middle, and far end of the plot).

We calculated plot vegetation height (cm) by averaging three measurements of vegetation height from the near, middle and far end of each plot. We measured substrate depth by inserting a thin metal rod (4 mm diameter) into the substrate until it reached bedrock at three locations (near, middle and far end) within each plot, to a maximum depth of 1.20 m, and averaged these three readings (Oberndorfer and Lundholm 2009).

We measured plot soil density (kg/cm^2) with a Digital Static Cone Penetrometer (Humboldt HS-4210) at three locations within each plot, and then averaged these readings. We collected soil nutrient samples at three separate locations per plot. At each location, we collected 100 mL of soil and pooled these subsamples to form one soil sample that was more representative of the overall soil conditions in the plot. Soil samples were analysed by the Nova Scotia Agricultural College for pH, organic matter, phosphorus (P_2O_5), potassium (K_2O), calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S), aluminum (Al), boron (B), copper (Cu), iron (Fe), manganese (Mn), zinc (Zn), and cation exchange capacity (CEC). We calculated average soil values for site and plot types. Soil sampling was not possible in some plots due to exposed bedrock and insufficient soil. We assigned each plot to one of four macrotopography classes: flat hilltop or bowl bottom (0-5% slope), gentle slope (6-15%), strong slope (16-30%), and extreme slope (31-45%). We also assigned each plot to 1 of 12 substrate classes (Appendix MM). The predominant drainage class of each plot was assigned as either: i. very poorly drained, or; ii. rapidly drained. We calculated average elevation for each plot from three elevation readings taken with the Garmin etrex Legend HCx GPS receiver.

4.2.7 Mapping

Aerial photography was scanned from 9" contact prints at 1200 dpi, and then georeferenced to CanVec+ 1:50,000 shorelines using ArcGIS. RMS for georeferencing varied from ~10-70m. Plot points were imported into ArcGIS and overlain on aerial photography and/or CanVec+ data. Distance tables were created from site to nearest mainland coastline and from plot to nearest coastline using ArcGIS's Near tool with geodesic measurements. All maps use the following coordinate system: map projection UTM Zone 21, and horizontal datum WGS 84.

4.2.8 Statistical analyses

We used two statistical analyses to understand patterns in our species data and our environmental data: Principal Components Analysis (PCA); and Redundancy Analysis (RDA). In the next two sections, we provide explanations of these analyses and how to interpret their graphical output. For further details on statistical analyses, please see Appendices NN-PP.

Results from statistical analyses were interpreted by Makkovimiut plant mentors by phone in November 2015, and again in person in January-February 2016 in Makkovik at an Elders' dinner, and with plant mentors individually. This interpretation has allowed us to understand some of the historical and contemporary practices that have left ecological footprints in plant communities and soils.

4.2.8.1 Understanding Principal Components Analysis (PCA)

A Principal Components Analysis (PCA) is a statistical method that helps us to understand relationships – how similar things are, and how different they are. In this work, we are trying to understand the similarities and differences among our three site categories (family fishing places, commercial fishing places, and tent ring sites). We are also trying to understand the similarities and differences among our 21 plots types (heath, tall shrub, wood house, garden, etc.). Specifically, we are looking at how these sites and these plots are similar or different based on their plant communities and environmental conditions, which are measured at the plot level.

Across all our sites, there are a total of 77 plots. For each individual plot, there is a list of species that are found in the plot, and an estimate of how abundant these species are. We recorded a total of 124 species across all plots, and every plot has some combination of this total species pool, in different abundances. For each plot, there are also measurements for 21 different environmental variables, such as average soil depth, elevation, and concentrations of nutrients and metals such as calcium, magnesium, iron, copper, and so on.

A PCA looks at these data—different permutations of 124 plant species, in different abundances, and measurements for 21 different environmental variables—and tells us which combinations of these characteristics best explain relationships between the plots. That is to say, a PCA tells us which combination of variables is most helpful in explaining why some plots are more similar to one another, and which plots are more different.

A species-only PCA looks at just plant species and their abundances to explain which plots are most similar to each other. On a scatter-plot, a PCA will place plots that have similar plant communities (in the types of species and their abundance) next to each other. The further apart two plots are, the more different their plant communities are. The position of these plots on the scatterplot doesn't matter – there is no absolute significance to a plot being on a positive axis or a negative axis. The plots are only important in relation to one another. The negative and positive parts of axes are often mentioned in interpretations of scatterplots to help direct readers to the relevant parts of the graph.

What is also important in these scatter plots is the position of species names relative to the centre (0,0) of the scatter plot. Species that are farther away from the center play a stronger role in explaining why plots are similar or different to one another. There are many species that are shared between plots, and these species will be at the center of the scatter plot. These species are not very good at explaining how plots are different because they are commonly found in all or many plots. It is important to look at species that are far away from the center, and to look for the plots that are near them. These species play a strong role in explaining why plots clustering around them are all so similar.

An environmental variable-only PCA also helps us explain how plots are similar or different to one another. Instead of looking at the species that are shared between plots, it looks at how plots are similar or different based on environmental variables. The same principles apply: plots that are close to each other in space are also similar in the environmental variables found at those plots. Environmental variables that are farthest from the center of the scatter plot are more powerful in explaining why plots are similar

or different. These environmental variables play a strong role in explaining why the plots around them are closely related. Again, the position of the plots and the variables on the x and y axes is not important. The position of plots and environmental variables is only important relative to one another.

A PCA works with many different variables at once to try to show relationships between plots. These relationships are actually happening in multi-dimensional space, in as many dimensions as there are variables. We can only look at relationships in two-dimensions at a time with a two-dimensional scatter plot. That is why a PCA will create a view of relationships on Axis 1 and 2, and then Axis 1 and 3, and then Axis 1 and 4, and so on, in an attempt to show us these relationships from multiple perspectives. The PCA tries to show the best explanation of relationships - this is the first principal component, shown in Axis 1 and 2. This view is the single best explanation of how plots relate to each other, and it explains most of the variation. Although every subsequent component explains less and less of the variation, sometimes we see interesting relationships between specific kinds of plots from a different perspective. This is why some graphs included in the results section look at the relationships between plots on axes beyond Axes 1 and 2.

4.2.8.2 Understanding Redundancy Analysis (RDA)

A Redundancy Analysis (RDA) also helps us to understand relationships. Whereas a PCA helps to show relationships between species and plots, or between environmental variable and plots, an RDA helps explain relationships between environmental variables and plant species. In our case, it shows how environmental variables like soil depth,

calcium, and salt affect plant communities. When a species occurs in the same part of the scatterplot as an environmental variable (or multiple environmental variables), it means that the species is most closely associated with those environmental conditions. If a species and an environmental variable are at opposite ends of an axis, that species occurs in conditions that are the opposite of that environmental variable. Similarly to the PCA, the RDA can also show similarities and differences among plots based on their species and environmental variables. As in the PCA, similar plots cluster closely together, and dissimilar plots will be far away from one another. The distance of the species and the environmental variables from the center of the scatterplot indicates how strongly the variables help explain relationships.

4.3 Findings

4.3.1 Plant species overview

We recorded a total of 124 species across 77 plots: 57 forbs, 28 trees and shrubs, 3 ferns, 6 lycopods, and 30 graminoids (Table 6). The most recurrent plant families were Poaceae (16 species), Ericaceae (14 species), Cyperaceae (12 species), Rosaceae (10 species), and Asteraceae (6 species). We found only three introduced species across all plots: chickweed (*Stellaria media*), *Vicia cracca*, and rhubarb (*Rheum* spp.). We have included photos of some of the most frequently mentioned plants to help readers familiarise themselves with these plants and with Makkovik plant names (Figure 9). The photo of bumblebee flower (*Chamerion angustifolium*) is courtesy of Mary B. Andersen.

Table 6 Full species list for all sites

Full species list for all sites, with SRANKs and code used for statistical analysis in R. Species follow scientific nomenclature from the Database of Vascular Plants of Canada (VASCAN 2015). Local names in Makkovik are included, where known, in English and Inuttit. SRANKs are from the Atlantic Canada Conservation Data Centre (NL); S1=Critically imperilled, ≤5 occurrences in province; S2=Imperilled, ≤20 populations in province; S3=Vulnerable, ≤80 populations in province; S4=Apparently secure, uncommon but not rare; S5=Secure, common, widespread and abundant; SNR=Not Assessed; SNA=Not Applicable, species not a suitable target for conservation activities (Atlantic Canada Conservation Data Centre 2015).

Genus	Species	Family	Local names in Makkovik (English and Inuttit)	SRANK	R Abbreviation
<i>Abies</i>	<i>balsamea</i>	Pinaceae	vir, fir	S5	Abie.bals
<i>Achillea</i>	<i>millefolium</i>	Asteraceae	chives	S3S4	Achi.mill
<i>Agrostis</i>	<i>mertensii</i>	Poaceae		S3S5	Agro.mert
<i>Agrostis</i>	<i>scabra</i>	Poaceae		S3S5	Agro.scab
<i>Alnus</i>	<i>viridis</i>	Betulaceae	alder, willows	S5	Alnu.viri
<i>Amelanchier</i>	<i>bartramiana</i>	Betulaceae	Indian plum, plum willow, plum tree	S3S5	Amel.bart
<i>Angelica</i>	<i>atropurpurea</i>	Apiaceae	hemlock, poison hemlock, umbellock, sinatuvak	S3S5	Ange.atro
<i>Arabis</i>	<i>alpina</i>	Brassicaceae		S3S4	Arab.alpi
<i>Arctopoa</i>	<i>eminens</i>	Poaceae		S3S4	Arct.emin
<i>Arctous</i>	<i>alpina</i>	Ericaceae	foxberry, bearberry	S5	Arct.alpi
<i>Betula</i>	<i>glandulosa</i>	Betulaceae		S5	Betu.glan
<i>Betula</i>	<i>minor</i>	Betulaceae		S4S5	Betu.mino
<i>Bistorta</i>	<i>vivipara</i>	Polygonaceae		S5	Bist.vivi
<i>Botrychium</i>	<i>lunaria</i>	Ophioglossaceae		S3S4	Botr.luna
<i>Calamagrostis</i>	<i>canadensis</i>	Poaceae	grass, Labrador grass, ivisugak	S5	Cala.cana

Genus	Species	Family	Local names in Makkovik (English and Inuttitut)	SRANK	R Abbreviation
<i>Carex</i>	<i>bigelowii</i>	Cyperaceae		S3S5	Care.bige
<i>Carex</i>	<i>brunnescens</i>	Cyperaceae		S3S5	Care.brun
<i>Carex</i>	<i>glareosa</i>	Cyperaceae		S3S5	Care.glar
<i>Carex</i>	<i>nigra</i>	Cyperaceae		S3S5	Care.nigr
<i>Carex</i>	<i>paleacea</i>	Cyperaceae		S2S4	Care.pale
<i>Carex</i>	<i>rariflora</i>	Cyperaceae		S4S5	Care.rari
<i>Carex</i>	sp.	Cyperaceae			Carex.sp
<i>Castilleja</i>	<i>septentrionalis</i>	Scrophulariaceae		S4	Cast.sept
<i>Cerastium</i>	<i>alpinum</i>	Caryophyllaceae		S4S5	Cera.alpi
<i>Chamerion</i>	<i>angustifolium</i>	Onagraceae	bumblebee flower, paunnaluk	S5	Cham.angu
<i>Chamerion</i>	<i>latifolium</i>	Onagraceae		S5	Cham.lati
<i>Cinna</i>	<i>latifolia</i>	Poaceae		S3S5	Cinn.lati
<i>Corallorhiza</i>	<i>trifida</i>	Orchidaceae		S3S5	Cora.trif
<i>Cornus</i>	<i>canadensis</i>	Cornaceae	crackerberry, sigalak	S5	Corn.cana
<i>Cornus</i>	<i>suecica</i>	Cornaceae	crackerberry, sigalak	S5	Corn.suec
<i>Deschampsia</i>	<i>flexuosa</i>	Poaceae		S3S5	Desc.flex
<i>Diapensia</i>	<i>lapponica</i>	Diapensiaceae		S4S5	Diap.lapo
<i>Diphasiastrum</i>	<i>alpinum</i>	Lycopodiaceae		S4S5	Diph.alpi
<i>Draba</i>	<i>incana</i>	Brassicaceae		SNR	Drab.inca
<i>Dryopteris</i>	<i>expansa</i>	Dryopteridaceae		S3S5	Dryo.expa
<i>Elymus</i>	<i>trachycaulus</i>	Poaceae		S3S5	Elym.trac
<i>Empetrum</i>	<i>nigrum</i>	Ericaceae	blackberry, paunngak	S5	Empe.nigr
<i>Epilobium</i>	<i>hornemannii</i>	Onagraceae		S3S4	Epil.horn
<i>Epilobium</i>	<i>lactiflorum</i>	Onagraceae		S3	Epil.lact
<i>Epilobium</i>	<i>palustre</i>	Onagraceae		S5	Epil.palu

Genus	Species	Family	Local names in Makkovik (English and Inuttitut)	SRANK	R Abbreviation
<i>Equisetum</i>	<i>arvense</i>	Equisetaceae		S5	Equi.arve
<i>Equisetum</i>	<i>sylvaticum</i>	Equisetaceae		S5	Equi.sylv
<i>Eriophorum</i>	<i>angustifolium</i>	Cyperaceae	cotton grass, Arctic cotton, cotton balls	S4S5	Erio.angu
<i>Eriophorum</i>	<i>scheuchzeri</i>	Cyperaceae	cotton grass, Arctic cotton, cotton balls	S2S4	Erio.sche
<i>Eriophorum</i>	<i>vaginatum</i>	Cyperaceae	cotton grass, Arctic cotton, cotton balls	S5	Erio.vagi
<i>Euphrasia</i>	<i>wettsteinii</i>	Scrophulariaceae		SNR	Euph.wett
<i>Festuca</i>	<i>brachyphylla</i>	Poaceae		S3S5	Fest.brach
<i>Festuca</i>	<i>rubra</i>	Poaceae		S4S5	Fest.rubr
<i>Galium</i>	<i>brevipes</i>	Rubiaceae		SNR	Gali.brev
<i>Geocaulon</i>	<i>lividum</i>	Santalaceae	deadly nightshade	S5	Geoc.livi
<i>Gymnocarpium</i>	<i>dryopteris</i>	Dryopteridaceae		S5	Gymn.dryo
<i>Hierochloe</i>	<i>odorata</i>	Poaceae		S3S5	Hier.odor
<i>Honckenya</i>	<i>peploides</i>	Caryophyllaceae		S5	Honc.pepl
<i>Huperzia</i>	<i>lucidula</i>	Lycopodiaceae		SNR	Hupe.luci
<i>Huperzia</i>	<i>selago</i>	Lycopodiaceae		SNR	Hupe.sela
<i>Iris</i>	<i>hookeri</i>	Iridaceae	iris	SNR	Iris.hook
<i>Juncus</i>	<i>filiformis</i>	Juncaceae		S4S5	Junc.fili
<i>Juniperus</i>	<i>communis</i>	Cupressaceae	juniper, ground juniper	S4S5	Juni.comm
<i>Kalmia</i>	<i>polifolia</i>	Ericaceae		S5	Kalm.poli
<i>Kalmia</i>	<i>procumbens</i>	Ericaceae		S4S5	Kalm.proc
<i>Larix</i>	<i>laricina</i>	Pinaceae	juniper, juniper tree, pingiak	S5	Lari.lari
<i>Lathyrus</i>	<i>japonicus</i>	Fabaceae	beach peas, saltwater peas, green peas, wild peas, sweet peas, peas	S5	Lath.japo
<i>Leymus</i>	<i>mollis</i>	Poaceae	grass, saltwater grass, ivik	S4S5	Leym.moll
<i>Ligusticum</i>	<i>scoticum</i>	Apiaceae	alexanders	S5	Ligu.scot

Genus	Species	Family	Local names in Makkovik (English and Inuttitut)	SRANK	R Abbreviation
<i>Linnaea</i>	<i>borealis</i>	Caprifoliaceae	twinflower, twin-bell flower	S5	Linn.bore
<i>Lonicera</i>	<i>villosa</i>	Caprifoliaceae		S5	Loni.vill
<i>Luzula</i>	<i>parviflora</i>	Juncaceae		S4S5	Luzu.parv
<i>Lycopodium</i>	<i>annotinum</i>	Lycopodiaceae		S5	Lyco.anno
<i>Oclemena</i>	<i>nemoralis</i>	Asteraceae	aster	S5	Ocle.nemo
<i>Omalothea</i>	<i>norvegica</i>	Asteraceae		S2S3	Omal.norv
<i>Packera</i>	<i>pauciflora</i>	Asteraceae		S4	Pack.pauc
<i>Picea</i>	<i>glauca</i>	Pinaceae	white spruce, spruce, napâttuk	S5	Pice.glau
<i>Picea</i>	<i>mariana</i>	Pinaceae	black spruce, spruce, napâttuk	S5	Pice.mari
<i>Pinguicula</i>	<i>vulgaris</i>	Lentibulariaceae		S4	Ping.vulg
<i>Plantago</i>	<i>maritima</i>	Plantaginaceae		S4S5	Plan.mari
<i>Poa</i>	<i>alpina</i>	Poaceae		S3S4	Poa.alpi
<i>Poa</i>	<i>arctica</i>	Poaceae		S3S4	Poa.arct
<i>Poa</i>	<i>glauca</i>	Poaceae		S3S4	Poa.glau
<i>Poa</i>	sp.	Poaceae			Poa.sp
<i>Potentilla</i>	<i>anserina</i>	Rosaceae		S5	Arge.anse
<i>Potentilla</i>	<i>norvegica</i>	Rosaceae		S3S5	Pote.norv
<i>Puccinellia</i>	sp.	Poaceae			Pucc.sp
<i>Pyrola</i>	<i>asarifolia</i>	Pyrolaceae		S2S4	Pyro.asar
<i>Pyrola</i>	<i>grandiflora</i>	Pyrolaceae		S3	Pyro.gran
<i>Pyrola</i>	<i>minor</i>	Pyrolaceae		S4	Pyro.mino
<i>Ranunculus</i>	<i>abortivus</i>	Ranunculaceae		S3S4	Ranu.abor
<i>Rheum</i>	spp.	Polygonaceae	rhubarbs, rhubarb, sinatuvak (rhubarbs), sinatuk (one rhubarb)	SNA	Rheu.rhab
<i>Rhinanthus</i>	<i>minor</i>	Scrophulariaceae		SNR	Rhin.mino

Genus	Species	Family	Local names in Makkovik (English and Inuttituk)	SRANK	R Abbreviation
<i>Rhodiola</i>	<i>rosea</i>	Crassulaceae	tulligunnak (many pronunciations: e.g. who-le-vee-nuk)	S4S5	Rhod.rose
<i>Rhododendron</i>	<i>groenlandicum</i>	Ericaceae	Indian tea, Labrador tea, mamaittuKutik	S5	Rhod.groe
<i>Rhododendron</i>	<i>tomentosum</i>	Ericaceae	Indian tea, Labrador tea, mamaittuKutik	S4S5	Rhod.tome
<i>Ribes</i>	<i>glandulosum</i>	Grossulariaceae	currants, kimminaujak	S5	Ribe.glan
<i>Rubus</i>	<i>arcticus</i>	Rosaceae	strawberries, appiujak	S3S5	Rubu.arct
<i>Rubus</i>	<i>chamaemorus</i>	Rosaceae	bakeapple, appik	S5	Rubu.cham
<i>Rubus</i>	<i>idaeus</i>	Rosaceae	raspberry	S4S5	Rubu.idae
<i>Rubus</i>	<i>pubescens</i>	Rosaceae	raspberry, strawberry	S4S5	Rubu.pube
<i>Salix</i>	<i>arctica</i>	Salicaceae	willows, addel (small or dwarf willows)	S3S4	Sali.arct
<i>Salix</i>	<i>arctophila</i>	Salicaceae	willows, addel (small or dwarf willows)	S4S5	Sali.arph
<i>Salix</i>	<i>glauca</i>	Salicaceae	willows, uKaujak (just the early leaves), pussy willow, uppigak	S5	Sali.glau
<i>Salix</i>	<i>planifolia</i>	Salicaceae	willows, uKaujak (just the early leaves), pussy willow, dogberry willow (tall willows with a gall), uppigak	S5	Sali.plan
<i>Salix</i>	<i>uva-ursi</i>	Salicaceae	willows, addel (small or dwarf willows)	S4S5	Sali.uvau
<i>Saxifraga</i>	<i>oppositifolia</i>	Saxifragaceae		S4	Saxi.oppo
<i>Sibbaldiopsis</i>	<i>tridentata</i>	Rosaceae		S3S5	Sibb.trid
<i>Solidago</i>	<i>macrophylla</i>	Asteraceae		S5	Soli.macr
<i>Sorbus</i>	<i>decora</i>	Rosaceae	dogberry, dogberry tree	S3S5	Sorb.deco
<i>Stellaria</i>	<i>borealis</i>	Caryophyllaceae		S4S5	Stel.bore
<i>Stellaria</i>	<i>longipes</i>	Caryophyllaceae		S4S5	Stel.long
<i>Stellaria</i>	<i>media</i>	Caryophyllaceae	chickweed	SNA	Stel.medi
<i>Streptopus</i>	<i>amplexifolius</i>	Liliaceae	twisted stalk	S5	Stre.ampl

Genus	Species	Family	Local names in Makkovik (English and Inuttitut)	SRANK	R Abbreviation
<i>Taraxacum</i>	<i>ceratophorum</i>	Asteraceae	dandelion, piss-a-beds	S3	Tara.cera
<i>Trichophorum</i>	<i>alpinum</i>	Cyperaceae		S3S5	Tric.alpi
<i>Trichophorum</i>	<i>cespitosum</i>	Cyperaceae		S5	Tric.cesp
<i>Trientalis</i>	<i>borealis</i>	Primulaceae		S5	Trie.bore
<i>Vaccinium</i>	<i>angustifolium</i>	Ericaceae	groundharts, blueberries, kigutanginnak	S5	Vacc.angu
<i>Vaccinium</i>	<i>boreale</i>	Ericaceae	groundharts, blueberries, kigutanginnak	S4S5	Vacc.bore
<i>Vaccinium</i>	<i>caespitosum</i>	Ericaceae	blueberries, kigutanginnak	S4S5	Vacc.caes
<i>Vaccinium</i>	<i>uliginosum</i>	Ericaceae	backieberries, blueberries, kigutanginnak	S5	Vacc.ulig
<i>Vaccinium</i>	<i>vitis-idaea</i>	Ericaceae	redberries, kimminak	S5	Vacc.viti
<i>Veronica</i>	<i>wormskjoldii</i>	Scrophulariaceae		SNR	Vero.worm
<i>Viburnum</i>	<i>edule</i>	Caprifoliaceae	squashberry	S5	Vibu.edul
<i>Vicia</i>	<i>cracca</i>	Fabaceae		SNA	Vici.crac
<i>Viola</i>	<i>labradorica</i>	Violaceae		S4S5	Viol.labr
<i>Viola</i>	<i>macloskeyi</i>	Violaceae		S5	Viol.macl
<i>Viola</i>	sp.	Violaceae			Viol.sp

Figure 9 Photos of frequently-mentioned plants

bumblebee flower (*Chamerion angustifolium*)

Labrador grass (*Calamagrostis canadensis*)

blackberries (*Empetrum nigrum*)

willows (*Salix glauca*)

hemlock (*Angelica atropurpurea*)

chickweed (*Stellaria media*)

Vicia cracca

rhubarbs (*Rheum* sp.)

backieberries (*Vaccinium uliginosum*)

Draba incana

strawberries (*Rubus arcticus*)

juniper tree (*Larix laricina*)

redberries (*Vaccinium vitis-idaea*)

crackerberries (*Cornus suecica*)

saltwater grass (*Leymus mollis*)

Carex nigra (in background – photo from Nova Scotia)

The most common species (the species that was most frequently encountered, in any abundance) across all plots was bumblebee flower (*Chamerion angustifolium*), which was found in 60 of 77 plots (i.e. 78% of all plots in this study contained bumblebee flower). Labrador grass (*Calamagrostis canadensis*) was found in 52 of 77 plots, and blackberry (*Empetrum nigrum*) was found in 47 of 77 plots. The most abundant species (total summed percentage cover across all plots) closely mirrored the most common species, although larger species such as willows (*Salix glauca*) and hemlock (*Angelica atropurpurea*) were more represented in abundance calculations due to their greater leaf area (Table 7).

Table 7 Common and abundant species

The 15 most common species (table on left), and the 15 most abundant species (table on right), across all 77 plots. Common species are the species whose presence-absence is most frequently reported in plots, and abundant species have the highest percentage cover across all plot area

Species	Total no. plots where species occurs (of 77 plots total)	% of all plots where species occurs
bumblebee flower (<i>Chamerion angustifolium</i>)	60	78
Labrador grass (<i>Calamagrostis canadensis</i>)	52	68
blackberry (<i>Empetrum nigrum</i>)	47	61
crackerberry (<i>Cornus suecica</i>)	43	56
willows (<i>Salix glauca</i>)	43	56
redberries (<i>Vaccinium vitis-idaea</i>)	41	53
<i>Stellaria borealis</i>	39	51
backieberries (<i>Vaccinium uliginosum</i>)	37	48

Species	Total abundance of species across all plots	% abundance
Labrador grass (<i>Calamagrostis canadensis</i>)	956	11
willows (<i>Salix glauca</i>)	833	10
blackberry (<i>Empetrum nigrum</i>)	765	9
bumblebee flower (<i>Chamerion angustifolium</i>)	751	9
strawberry (<i>Rubus arcticus</i>)	561	6
hemlock (<i>Angelica atropurpurea</i>)	450	5
crackerberry (<i>Cornus suecica</i>)	434	5
beach pea (<i>Lathyrus japonicus</i>)	372	4

Species	Total no. plots where species occurs (of 77 plots total)	% of all plots where species occurs
strawberry (<i>Rubus arcticus</i>)	33	43
beach pea (<i>Lathyrus japonicus</i>)	31	40
hemlock (<i>Angelica atropurpurea</i>)	25	32
<i>Festuca rubra</i>	24	31
saltwater grass (<i>Leymus mollis</i>)	24	31
bakeapples (<i>Rubus chamaemorus</i>)	22	29
<i>Stellaria longipes</i>	22	29

Species	Total abundance of species across all plots	% abundance
<i>Stellaria borealis</i>	300	3
<i>Festuca rubra</i>	296	3
willows (<i>Salix planifolia</i>)	265	3
saltwater grass (<i>Leymus mollis</i>)	258	3
backieberries (<i>Vaccinium uliginosum</i>)	185	2
Alexanders (<i>Ligusticum scoticum</i>)	159	2
currants (<i>Ribes glandulosum</i>)	150	2

4.3.2 Site-level flora

Category 1 (family fishing places) sites all had differences in their most common species (Appendix TT). At Tom's Cove, boreal species such as starflower (*Trientalis borealis*), vir/fir (*Abies balsamea*), and ground juniper (*Juniperus communis*) were strongly represented. At Ikey's Point, salt-tolerant species were common, including saltwater grass (*Leymus mollis*) and alexanders (*Ligusticum scoticum*). October Harbour had a unique suite of species not found at other sites, including *Arabis alpina* and *Ranunculus abortivus*. Both October Harbour and Ikey's Point had numerous plots containing hemlock (*Angelica atropurpurea*) (100% and 50% of plots, respectively). Bumblebee flower (*Chamerion angustifolium*) was present at all three Category 1 sites.

Species common to Category 2 sites (commercial fishing places) were bumblebee flower, Labrador grass, willows, and crackerberry. Strawberries (*Rubus arctica*) and *Festuca rubra* were strongly represented at East and West Turnavik, but not at Ironbounds. The frequency of blackberry in plots was variable: high at Ironbounds, low at East Turnavik, and not amongst the ten most frequent species at West Turnavik.

Heath species were common at Category 3 sites (tent rings), including blackberries, backieberries (*Vaccinium uliginosum*), and redberries (*Vaccinium vitis-idaea*). East Turnavik Point had more maritime species, such as tulligunnak (*Rhodiola rosea*) and *Plantago maritima*, whereas Malona and Tupik Point both had the heath species *Rhododendron tomentosum* and crackerberry. Bumblebee flower was only infrequently found at East Turnavik Point, and not at all at either Malona or Tupik Point.

Stellaria borealis was frequently encountered in all Category 1 and 2 sites, but only in a single plot at one Category 3 site. Beach pea (*Lathyrus japonicus*) was also found more frequently at Category 3 sites than at Category 1 or 2 sites.

4.3.3 Principal Components Analysis (PCA) – species only

Only two species show a strong separation on the first two PCA axes (Figure 10; in the subsequent text, capital letters in brackets refer to specific areas of the figure). On PCA Axis 1, blackberry has a strong positive score (A). To a lesser degree, backieberries is also located in this direction along Axis 1. These two species are associated with tent ring plots (Category 3 sites), as well as heath and inland rock plots from other site categories. On PCA Axis 2, willows have a very strong negative score (B). Clustering with willows are many of the wood house plots from Category 2 sites. There are also some low shrub plots and an unknown structure from other sites here as well. There are no species that are as strongly projected on positive side of Axis 2 as willows are on negative Axis 2. Many of the plots on the positive side of Axis 2 are from family fishing places (Category 1 sites) (C). Negative scores on PCA Axis 1 are associated with Labrador grass, bumblebee flower, hemlock, strawberries, and *Stellaria borealis*. The plots clustering near these species garden, midden and sod house plots (D). In Figure 11, saltwater grass is associated with positive PCA Axis 3, and with shoreline plots from all sites, particularly at Ikey's Point (A) (for eigenvalues, see Appendix QQ).

The scatterplot shows Axes 1 and 2 for the species-only PCA. Areas of the scatterplot that are described in the preceding paragraph are indicated by letters A-D. Not all 124 species are named in this scatterplot. The names of species in the centre of the scatterplot were changed to red dots to make the scatterplot more legible.

4.3.4 Plot-level flora

Below follow descriptions of the most common and abundant species at each of the 21 plot types.

Grass

The most common species in grass plots are bumblebee flower and backieberries. However, Labrador grass (31% cover) is far more abundant than bumblebee flower (8% cover), as are *Festuca rubra* (15% cover) and strawberries (13% cover).

Heath

Blackberry is dominantly abundant in this plot type (54% cover) and is also one of the most frequently encountered species, with occurrences in every heath plot. Other abundant and recurrent species are backieberries (9% cover), redberries (3% cover), and bakeapples (*Rubus chamaemorus*) (3% cover). *Carex rariflora* has 6% cover but is found at only four of five heath plots.

Inland rock

Blackberry is also dominant in this plot type, with 26% cover; this species is found at every inland rock plot. Backieberries and redberries are also found at all seven plots, with 11% and 5% cover, respectively. Labrador grass (11% cover) and bumblebee flower (10% cover) are found at three plots each.

Low herb

The most recurrent species in low herb plots is bumblebee flower, found at all five plots. However, this species has only 9% cover. The most abundant species in the low herb plots is beach pea (18% cover). Alexanders (*Ligusticum scoticum*) (9%), strawberries (8%), and *Stellaria borealis* (7%) were all found at four of five plots.

Low shrub

Willows (*Salix glauca*) is the dominant species in this plot type, found in all low shrub plots, and has 42% cover. Crackerberry (*Cornus suecica*) was found at three of four sites and has 15% cover. Dwarf birch (*Betula glandulosa*) has 14% cover, but was found only at a single site.

Shoreline cobble

Saltwater grass and bumblebee flower were the most frequently encountered species in the shoreline cobble plots. Saltwater grass was much more abundant (46% cover) compared with bumblebee flower (8%).

Shoreline grass

Saltwater grass was also most abundant (33%) and most frequently encountered in the shoreline grass plots. Bumblebee flower (11%) and Alexanders (13%) were found at both shoreline grass plots. Strawberry (15%) and *Stellaria borealis* (14%) were more abundant than bumblebee flower and Alexanders but were only found in one plot.

Shoreline rock

Alexanders was the most abundant (14% cover) and most frequently encountered species in this plot type. Bumblebee flower (10%), saltwater grass (10%), blackberry (10%), and willows (*Salix glauca*) (10%) were also found at both plots.

Tall herb

The most abundant species in this plot type was Labrador grass (18% cover), followed by bumblebee flower (17%). Both species were found in all plots. Currants (*Ribes glandulosum*) (11%) were found in two of three plots.

Tall shrub

This plot type was dominated by willow (*Salix planifolia*) (51% cover), followed by currants (11%), and goldenrod (*Solidago macrophylla*) (7%). All three species were found in both plots of this type.

Garden

Willows (*Alnus viridis*) (12% cover) was the most abundant species in this plot type; however, this species was only found in a single plot. The most frequently encountered species in garden plots were bumblebee flower (10%) and Labrador grass (6%), which were found in all five plots. The grasses *Poa arctica* (11%) and *Festuca rubra* (9%) were found in two of five plots. Strawberries and *Stellaria borealis* were found in four of five garden plots, but were not abundant (4% each).

Midden

Strawberries were the most abundant plant at midden plots, with 21% cover, but were found at only two of the three sites where middens occurred. The most frequent species found at all three midden sites were bumblebee flower (9%), *Stellaria borealis* (6%), *Festuca rubra* (5%), and *Stellaria longipes* (2%). Labrador grass (16% cover) and hemlock (12%) were more abundant but were found at only two of three sites. *Vicia cracca* (10% cover) was found at one site, where it was very locally abundant.

Sod house

Sod houses had a fairly consistent suite of species. Species such as hemlock, bumblebee flower, crackerberry, willows (*Salix glauca*), *Stellaria borealis*, and Labrador grass were found at all five sod house plots. Of these species, the most abundant was bumblebee flower (19% cover), followed by Labrador grass (15%), and hemlock (14%). Strawberries (14%) and beach pea (9%) were also abundant and found at four of five plots.

Stage

Stellaria borealis was the most abundant species (17%), followed by bumblebee flower (11%). These species were found at both stage plots. Labrador grass (6%) was the next most abundant species found at both plots.

Tent ring

Blackberries were the dominant plant at tent ring plots (70% cover) and were found at all five plots. Backieberries were the next most abundant plants (9%) and were also found at all five plots. Beach pea had 7% cover, but this is based entirely on its abundance at a single site. Redberries and *Rhododendron tomentosum* were found at three of five tent rings and each had 3% cover.

Tent site

The most abundant species at this plot type was bumblebee flower (15% cover), which was found at both tent site plots. Backieberries (9% cover) were also found in both plots. Species such as hemlock (11%) and *Juncus filiformis* (11%) were locally abundant but found at only one site each.

Unknown structure

Labrador grass was the most abundant species (37% cover) and was found at all plots. Crackerberries was the second most abundant species (12%) and was also found at all plots. Bumblebee flower (12%), willows (*Salix glauca*) (8%), and beach pea (7%) were found at three of four plots.

Wood house

Bumblebee flower was the only species found at all 12 plots, but had only 9% cover. Willows (*Salix glauca*) were the most abundant plants with 26% cover, but were found at only 6 of the 12 plots. Similarly, hemlock was abundant overall (16% cover) but was

found in only 6 of 12 plots. Labrador grass (11% cover) was found in nine plots, and strawberries (4% cover) was found in six plots. Willows (*Salix glauca*) were strongly dominant in the six plots where it was found (5 of 6 plots had >50% abundance), and the remaining plot had 20% abundance. All of these plots were at commercial fishing places (Category 2 sites). Similarly, hemlock was dominant in half the plots in which it occurred (>50% cover), all of which were plots at family fishing places (Category 1 sites).

4.3.5 Plant communities of undisturbed vs. built environment plots

Built environment plots shared 61 species with undisturbed plots, which is 49% of the total recorded species (124) across all plots (Table 8). Of the 10 most frequently encountered species, 8 species were shared between built environment plots and undisturbed plots. The most common species in both types of plots was bumblebee flower. Occurrence frequency is one of the main differences amongst shared species. For example, 84% of the built environment plots contained bumblebee flower, as compared to 73% of undisturbed plots. Blackberries were found in 70% of undisturbed plots, but in only 51% of built environment plots. Labrador grass was found in 78% of built environment plots, and in 58% of undisturbed plots. The different frequency of occurrence for *Stellaria borealis* in the two types of plots was also pronounced: this species had the third highest rate of occurrence in built environment plots (65%) and 12th highest rate of occurrence for undisturbed plots (38%). Hemlock has a similarly higher rate of occurrence in built environment plots, in which it is the eighth most common, occurring in 43% of plots. By contrast, this species is the 19th most common species in undisturbed plots, occurring in only 23% of plots.

Table 8 Flora of undisturbed and built environment plots

The 10 most frequently encountered species in undisturbed plots (total 40 plots) and built environment plots (total 37 plots).

Species	Total no. undisturbed plots in which species occurs (of 40 plots)	% of undisturbed plots in which species occurs
bumblebee flower (<i>Chamerion angustifolium</i>)	29	73
blackberries (<i>Empetrum nigrum</i>)	28	70
Redberries (<i>Vaccinium vitis-idaea</i>)	26	65
crackerberries (<i>Cornus suecica</i>)	23	58
backieberries (<i>Vaccinium uliginosum</i>)	23	58
Labrador grass (<i>Calamagrostis canadensis</i>)	23	58
willows (<i>Salix glauca</i>)	22	55
bakeapple (<i>Rubus chamaemorus</i>)	18	45
beach pea (<i>Lathyrus japonicus</i>)	17	43
strawberries (<i>Rubus arcticus</i>)	16	40

Species	Total no. built environment plots in which species occurs (of 37 plots)	% of built environment plots in which species occurs
bumblebee flower (<i>Chamerion angustifolium</i>)	31	84
Labrador grass (<i>Calamagrostis canadensis</i>)	29	78
<i>Stellaria borealis</i>	24	65
willows (<i>Salix glauca</i>)	21	57
crackerberries (<i>Cornus suecica</i>)	20	54
blackberries (<i>Empetrum nigrum</i>)	19	51
strawberries (<i>Rubus arcticus</i>)	17	46
hemlock (<i>Angelica atropurpurea</i>)	16	43
Redberries (<i>Vaccinium vitis-idaea</i>)	15	41
beach pea (<i>Lathyrus japonicus</i>)	14	38

4.3.6 Species richness

The most species-rich site (highest total number of species recorded at that particular site) was Tom's Cove, which had 44 species. East Turnavik was the second most species-rich site with 38 species. Ikey's Point had the fewest species (25 species) (Table 9).

Table 9 Species richness at the site level.

Site name	Total no. species at site	Site category
Tom's Cove (TOC)	44	1
East Turnavik (ETU)	38	2
Ironbounds (IRO)	35	2
Tupik Point (TPT)	34	3
October Harbour (OCH)	32	1
West Turnavik (WTU)	30	2
East Turnavik Point (ETP)	29	3
Malona Point (MPT)	26	3
Ikey's Point (IKP)	25	1

Due to species-area relationships, large plots may have smaller numbers of species/unit area than small plots (Connor 1979). In general, comparisons that look broadly at differences in species richness amongst plot types are therefore not particularly useful in this study, in which plot area is not standardised. However, comparisons between plot types with similar total area do give some insight into species richness for select plot types. For example, middens and tent rings have an identical total area by plot type (83 m²). Middens had a total species pool of 20 species, compared to the 14 species found across all tent ring plots. Gardens (total area 206 m²) had a total species pool of 45 species, compared with the 22 species found at sod houses (146 m²) or the 27 species found at tall shrub plots (303 m²) (Table 10).

Table 10 Species richness by plot type, and number of species per unit area (m²)

Plot type	No. of plots of this type	Total no. spp that occur in plot type	Total combined area of plot type (m ²)	No. spp. per unit area (m ²)	Undisturbed (U) or built environment (B) plot
Tent site	2	26	27	0.96	B
Bog	1	19	27	0.70	U
Midden	3	20	83	0.24	B
Garden	5	45	206	0.22	B
Unknown structure	4	30	139	0.22	B
Tent ring	5	14	83	0.17	B
Stage	2	24	148	0.16	B
Sod house	4	22	146	0.15	B
Pond	2	10	108	0.09	U
Wood house	12	53	575	0.09	B
Tall shrub	2	27	303	0.09	U
Tall herb	3	40	626	0.06	U
Grass	3	28	538	0.05	U
Conifer	1	12	269	0.04	U
Shoreline rock	2	14	314	0.04	U
Low shrub	4	27	664	0.04	U
Low herb	5	38	1010	0.04	U
Inland rock	7	49	2559	0.02	U
Shoreline grass	2	13	729	0.02	U
Heath	6	52	3400	0.02	U
Shoreline cobble	2	11	1147	0.01	U

4.3.7 Principal Components Analysis (PCA) – environmental variables only

Positive PCA Axis 1 scores are associated with a suite of environmental variables, including cation exchange capacity (CEC), calcium (Ca), boron (B), sulphur (S), and pH (Figure 12). These variables are at a right angle to the variables copper (Cu), magnesium (Mg) and iron (Fe), which are associated with the positive PCA Axis 2. Many plots from East and West Turnavik (Category 2 sites) are in this positive quadrant in between these

two groups of environmental variables (A). Zinc (Zn) and phosphorus (P_2O_5) are also associated equally with positive PCA Axis 1 and positive PCA Axis 2. The plots from Ironbonds are on the negative side of PCA Axis 1 and Axis 2, opposite to the plots from East and West Turnavik (B). Organic matter is associated with negative PCA Axis 2, and many of the plots clustering around this environmental variable are tent ring and heath plots (C). Plots from Seal Cove and from some gardens are opposite these tent ring and heath plots on the positive side of Axis 2 (D). If we look at Axes 1 and 4, we see that tent ring plots group very closely to aluminum (Al) on positive Axis 4 (Figure 13; A) (for eigenvalues, see Appendix RR). Tent ring plots from East Turnavik Point do not appear on this scatterplot because there was insufficient soil for the analysis.

Figure 12 Environmental variables-only PCA, Axes 1 and 2, with plot names

The scatterplot shows Axes 1 and 2 for the environmental variables-only PCA. Areas of the scatterplot that are described in the preceding paragraph are indicated by letters A-D.

The scatterplot shows Axes 1 and 4 for the environmental variables-only PCA. The area of the scatterplot that is described in the preceding paragraph is indicated by the letter A.

4.3.8 Soil chemistry trends by site

Soils at Ikey's Point were distinct in having the highest values of all sites for potassium (597 kg/ha), calcium (6363 kg/ha), magnesium (1700 kg/ha), sodium (313 ka/ha), sulphur (121 ka/ha), and boron (2.40 ppm), as well as the highest cation exchange capacity (CEC) (28.4 meq/100gm) and pH (5.92). Soils at tent ring sites (Category 3) were highest in organic matter and had the lowest pH, with the exception of Tom's Cove (pH 4.16). Tent ring soils were also lowest in phosphorus, copper, iron, manganese, and zinc, but one tent ring site (Tupik Point) had the third highest soil aluminum value (314 ppm) of all plots. The highest aluminum value was found at October Harbour (Category 1 site), at 940 ppm. October Harbour also had high calcium readings (4975 kg/ha); the lowest calcium values were found in soils at Ironbounds (Category 2; 623 kg/ha). West Turnavik (Category 2) had soils with the highest values of iron (369 ppm), copper (7.26 ppm), and zinc (99.28 ppm). Soils at Ironbounds were also high in iron (306 ppm). Phosphorus values were highest at West Turnavik (955 kh/ha), followed by East Turnavik (543 kg/ha). Organic matter was lowest at the commercial fishing places (Category 2 sites) (Appendix UU).

4.3.9 Soil chemistry trends by plot types

Average soil values by plot type show that pH values were similarly low for heath (4.39) and tent rings (4.50); however, tent rings have 2.5 times higher levels of phosphorus than health plots (166 kg/ha vs. 66 kg/ha). Soils at tent rings are also higher in potassium (312 kg/ha) and magnesium (571 kg/ha) than heath plots, and aluminum readings at tent rings are the second highest of all plot types (576 ppm). Soil iron levels are elevated at stages

(440 ppm) and wood houses (282 ppm), and low at heath (82 ppm) and conifer (30 ppm) plots. High values of phosphorus were found at middens (1267 ppm – mostly due to one exceptionally high reading at the West Turnavik midden heap), stages (580 kg/ha), and gardens (555 kg/ha). Midden plots had high levels of calcium (7740 ca/ha), boron (2.11 ppm), CEC (28.3 meq/100gm), pH (5.96), and copper (10.04 ppm). Gardens also had high levels of copper (10.41 ppm), aluminum (570 ppm), and manganese (51 ppm). Sod house plots had high pH (5.92) and calcium values (5657 ca/ha), and low potassium values (195 kg/ha) (Appendix VV).

4.3.10 Redundancy Analysis (RDA)

On the negative side of RDA Axis 1, we see that high organic matter is closely linked to heath species such as blackberries and backieberries (Figure 14; A). On the positive side of RDA Axis 1, there is a large group of environmental variables: phosphorus, copper, calcium, zinc, iron, boron, cation exchange capacity, soil depth, sulphur, manganese, and vegetation height. The species loading closest to this group of environmental variables are strawberries, bumblebee flower, and *Stellaria borealis* (B). On the negative side of RDA Axis 2, we find the variables sodium, potassium, and magnesium. We also see that willows (*Salix glauca*) are strongly associated with these variables (C). On the positive side of Axis 2 we find the environmental variables aluminum, substrate depth, and elevation, along with the species Labrador grass and currants (D). Hemlock sits in between the gradients in the positive part of the x and y axes (for eigenvalues, see Appendix SS). In Figure 15, some plots labels have been retained to show where the plots are in relation to these species and environmental variables.

Figure 14 RDA, Axes 1 and 2, showing select species and environmental variables

The scatterplot shows Axes 1 and 2 for the RDA, with species and environmental variables displayed. Areas of the scatterplot that are described in the preceding paragraph are indicated by letters A-D. Not all 124 species are present in this scatterplot. Only species that are furthest from the centre of the scatterplot are displayed in order to make the scatterplot more legible.

The is the same scatterplot as Figure 14 but with select plots added. Plots at the centre of the scatterplot are indicated with a black dot instead of their full name, in order to make the scatterplot more legible.

4.4 Discussion

4.4.1 Question 1 – Are plant communities distinct at different site types?

Plant communities at tent ring sites (Category 3) include a consistent group of species such as blackberries and backieberries. In their species composition and pH values, tent ring sites resemble the heath plots found at other sites. However, soils at tent ring sites show consistently elevated levels of phosphorus, potassium, and magnesium compared to heath plots, and even as compared to other plots at the commercial fishing site of Ironbounds. The similarities in plant community composition between tent ring sites and other heath plots appear to indicate that moderately increased levels of soil nutrients are not always sufficient to visibly alter vegetation communities in heathlands, and that soil disturbance—of which there is little to none at tent ring sites—may play a larger role in structuring vegetation in this habitat type.

The similar plant communities of tent ring sites and heath plots are a cautionary tale that plant communities alone are not solely sufficient as indicators of human site history. Tent ring sites, especially those at Malona Point and Tupik Point, are on the spring and fall migration route for waterfowl, and are also excellent places to hunt seal at the sina (edge of the landfast sea ice). They are important harvesting sites for Makkovimiut, and they would have historically been important harvesting sites for people living in the sod houses at nearby Long Tickle, who would have camped at these tent rings while hunting. Seals and birds are often cleaned at the water's edge, and most organic materials from harvesting at tent ring sites would have entered the water rather than a land-based midden. Nevertheless, sufficient organic materials were deposited around tent rings during use of the sites to create detectable increases in nutrient levels.

Although not as physically visible as the tent ring stones themselves, soil nutrient levels demonstrate the long-term importance of these sites to Makkovimiut and their ancestors.

Family fishing places (Category 1) do not show the same consistency as tent ring sites in their plant communities at the site level. This variability is largely due to geography and available species pool. Tom's Cove is in a more sheltered location inside Makkovik Bay, and contains more boreal forest species. In comparison, Ikey's Point and October Harbour are more exposed to maritime influence, and have more halophytic species that are adapted to an exposed maritime environment. The physical landscape at Ikey's Point is startlingly new due to post-glacial rebound, and vegetation has replaced rock and tidal pools in only the last 60 years (Toby Andersen 2015). Ikey's Point plots associate closely with potassium, magnesium and sodium variables (Figure 12), and these associations testify to the strong effects of salt water on soil conditions at this site.

Amongst the commercial fishing sites (Category 2), West Turnavik and East Turnavik are more similar to each other than to Ironbounds in their plant communities and environmental variables. Plots at West Turnavik group quite closely together in the species-only PCA, more so than the plots at East Turnavik or Ironbounds. West Turnavik has very little blackberries, the absence of which points to extensive mechanical disturbance (Tybirk et al. 2000) as would be expected through trampling and digging. Of the Category 2 sites, West Turnavik plots also show the highest and most consistent levels of nutrient enrichment. It is possible that nutrients from the West Turnavik midden heap are leaching downhill to other plots, or that there were unknown nutrient inputs in seemingly undisturbed West Turnavik plots. East Turnavik plots do not cluster as closely according to site, either in the species or environmental PCA. Plots cluster variously:

some with the high-nutrient plots at West Turnavik others with more undisturbed heath and inland rock plots, and still others with a group of shrub and wood house plots from other sites. East Turnavik has a varied history with overlapping site uses through time. It has been an area for mixed harvesting, sod house construction, a stopover place on a main travel route, an important commercial fishing place, and a continued site for family cabins and fishing for Makkovimiut. The built environment at East Turnavik is a mix of sod houses, former wooden bunkhouses, a stage, wooden boardwalks, and at least one midden. Plant communities and soil nutrients at East Turnavik therefore reflect a mix of anthropogenic influences including mechanical disturbance and nutrient enrichment. Plant communities and environmental variables are responding to this complex mix of influences, resulting in no clear clustering of plots according to site.

Plots at Ironbounds (Category 2 site) show some of the lowest values of soil nutrients. Unlike the other sites in this category, there are few site-level indications of anthropogenic effects on either vegetation or soil nutrients at Ironbounds. The only site affinity plots at Ironbounds show is in *not* grouping with plots from East and West Turnavik. Iron is the only metal found at elevated concentrations at the site-level at Ironbounds. These soil iron levels may be naturally-occurring rather than due to fishery activities (discussed later in this section). Zinc levels are not correspondingly high, which indicates that galvanised iron is probably not the source of the iron enrichment as it is at other Category 2 sites, where zinc levels are also elevated.

One possible reason that Ironbounds lacks some of the key vegetation and nutrient signatures of West and East Turnaviks is that houses in the main cove at Ironbounds were supplied with piped water from a gravity feed. Running water would have helped flush

wastes into the harbour, which in effect functioned as the site midden. It was necessary to flush wastes into the harbour because houses in this cove were located in a wetland, and a midden pile in saturated ground would have contaminated drinking water. Sampling decisions may also be responsible for missing localised areas of high nutrient values. The area sampled at Ironbounds focused on former bunkhouse locations, not in this wetland, in an effort to keep site conditions consistent at all sites. Strong wave action may also affect soil nutrient levels at Ironbounds. Although Ironbounds has a good harbour that is well-sheltered from wind, the harbour experiences heavy seas that may leach soil nutrients into the harbour through wave action. Wave action at the site is so extreme that in the 1980's a heavy sea at Ironbounds pulled several houses into the water, flipped a cement wharf, and tore a longliner called the "*Blanche Marie II*" from her moorings and drove her aground at Tessialuk (John Winters 2015a). West and East Turnavik are comparatively better protected from both wind and sea. Finally—and perhaps most critically—the area sampled at Ironbounds shows no influence of Inuit use. There are no tent rings, sod houses or middens. Although it has a good harbour and excellent fish, Ironbounds is not a good site for seals year-round (though excellent for seals in winter and spring). It is not on a major travel route like nearby Wester Island and Ragged Islands, both of which have sod houses. Ironbounds is a hard place to stay for long periods, and is therefore unlike East and West Turnavik in terms of diversity of historical site uses. Ironbounds is first and foremost a place for fishing. Where Inuit have lived and harvested, they have in many ways had more detectable and lasting effects on plant communities and soil nutrients at the site level than the industrial-scale commercial codfishery at these islands.

The most detectable effects of past commercial fishing activities are in the increased levels of metals that remain in the soils of fishing stations. The site-wide high levels of iron, copper and zinc at East and West Turnaviks are testament to the numerous sources of galvanised iron and copper in the fishery. Iron was used in anchors, grapples, mooring rings, stoves, boilers, water storage barrels, nails, in stage construction, and in enormous iron barking pots, in which white hemp line was soaked with bark (usually juniper tree, *Larix laricina*) to darken or “bark” the nets and make them less visible to codfish. In spring, when local people supplied the fishing stations with wood from the mainland before the arrival of the schooners, they used komatiks (sleds) with iron shoeings to travel over sea ice to the islands. We found one of these old iron komatik shoes at East Turnavik not far from the bunkhouse. Copper was used in copper nails and rivets for boats, as sheathing on the hull of schooners, and in kettles. The barrels used to transport salt cod had copper rings. Both a blacksmith and a cooper worked in the fishery at West Turnavik: “Bartlett had a cooper shop and a blacksmith shop on his premises. I can remember the big old bellows and the forge. They could do any kind of iron work, fix rudders for boats” (McNeill and Markham 1979, 27).

Elevated levels of iron, copper and zinc do not appear to have a structuring effect on plant communities, though these metals load closely with other soil nutrients in the RDA. It may be that high-use areas at commercial fishing sites received indiscriminate additions of both metals and nutrients, and it is nutrient levels that play a greater role in structuring plant communities. Plant community composition is therefore not very good at distinguishing family fishing areas, commercial fishing areas, and areas of mixed

harvesting. Only tent ring sites showed any kind of consistent “site flora”, which had the same plant community composition as heath plots.

4.4.2 Question 2 – Do different built environments have unique plant communities?

4.4.2.1 Overview

Whereas vegetation signatures at the site level are muddled by multiple site uses over time, plant communities of individual built environments are more consistent in composition. Fishing and other harvesting activities have therefore not left site-level footprints so much as they have transformed plant communities of the localised built environment, and in doing so created a diverse urban northern flora.

Built environments around Makkovik share many of their most common species with areas where there is no visible human disturbance. Where built environment and undisturbed plots differ is in the abundance of common species. Plants such as bumblebee flower and Labrador grass are more abundant in the built environment. These species are well-known as early successional plants that rapidly establish after mechanical disturbance and nutrient enrichment (Lieffers et al. 1993, Dunbar et al. 2011). Relatedly, the relative scarcity of blackberries in built environment plots suggests that mechanical disturbance plays a role in structuring northern urban plant communities, given the sensitivity of this species to trampling and soil compaction (Hylgaard and Liddle 1981, Tybirk et al. 2000).

The three most distinct species of the northern built environment are hemlock, *Stellaria borealis* and *Draba incana*, which are more frequent and more abundant in built

environment plots than in plots without built structures. However, these species were not found at tent rings, suggesting that moderate nutrient enrichment without soil disturbance is not sufficient for their growth. *Stellaria borealis* is found more frequently than hemlock at built environment structures where there is soil disturbance, and appears to respond more successfully to a wider range of soil nutrient enrichment. Hemlock responds more specifically to the alkalinity created by high calcium environments, such as at shell middens (Vanderplank 2014). *Stellaria borealis* appears to be the ruderal chickweed (*Stellaria media*) of this latitude, present at mechanically disturbed sites generally, whereas hemlock is more specifically an indicator of calcareous soils. Further north in the region, *Montia fontana* was identified an indicator of disturbed sites (Roy et al. 2012), but this species was not found at any sites near Makkovik. *Montia fontana* requires wetter soils and may be a better indicator for disturbance in boggy areas further to the north.

4.4.2.2 Wood houses: commercial and local fishery

The species-only PCA demonstrates that the wood houses of commercial fishing places and the wood houses of Makkovimiut family fishing places have consistently different and distinct plant communities. Willows (*Salix glauca*) are dominant at the wood houses of commercial fishing sites; in contrast, wood houses of local fishing places have plant communities that resemble the plant communities of sod houses and middens, where hemlock is dominant. Willows and wood houses of commercial fishing sites are closely associated with soils high in potassium, magnesium and sodium (Figure 15). The type and quantity of decaying wood may be responsible for increased potassium and

magnesium levels at former commercial fishery buildings (Hafner et al. 2005).

Newfoundland fishermen brought their own lumber aboard their schooners, possibly including wood milled from white pine (*Pinus strobus*) found in Newfoundland, whereas local people sawed their own lumber from local trees, usually spruce (*Picea* spp). An additional possibility is that elevated soil readings of potassium, magnesium and sodium at the wood houses of commercial fishing sites are from the large quantities of coarse salt used to salt codfish (Oliviera et al. 2012). Labrador fish reportedly required an extra-strong salt imported from Santa Pola (Spain) (Kirwin et al. 1990), where salt was extracted from seawater. Many willow species (*Salix* spp.) are salt tolerant (Hangs et al. 2010), and as early-successional plants willows would thrive in the post-disturbance conditions created by old fishery buildings. Kitchen wastes that were dumped just outside wood houses would have contributed additional salt from salt beef, canned foods, and cooking water, and foods were often stored in dry salt around bunkhouses (Junior Andersen, pers. communication, 28 January 2016). Salt slopped over handbarrels full of salted fish as they were carted out to the bawn to dry, and coated the work boots of people working at the stages, before it was tracked around the buildings at the end of the day (Herb Jacque 2016). In his journals, Cartwright also hypothesised that altered vegetation at fishing stations was due to additions of salt (Cartwright 1792), although the transformation of heathland to grassland he observed is more consistent with nutrient enrichment (Heil and Bobbink 1993, Power et al. 1998), likely through fish processing wastes, rather than additions of salt alone:

On landing in the harbour of Catalina (Newfoundland), on my last voyage from Trinity to Labrador, I observed a luxuriance of herbage, which I did not suppose the soil, in that part of the world capable of producing; but on a closer inspection I found, the extent of that fertility was confined, to those places on which fish had

formerly been cured; some small degree of verdure appeared on the adjoining land, which I knew must have been trampled on; but beyond that, the earth exhibited its original barren state. I was consequently led into a belief, that the brine, which drained out of the fish when they were first spread, was the cause of so great an alteration: and I was confirmed in this opinion, on my arrival at Conch; where I found but few of the former fishing-rooms occupied, and all the rest bearing a burden of fine grass, which would not have disgraced the best meadows in England; while the surrounding land still remained as barren, as any other parts of the island (Cartwright 1792, 237).

At local fishing sites, the quantity of salt used in preparing fish would have been substantially less given the smaller scale of the family fishing operations. The dominant species at local wood houses, such as hemlock, are more associated with variables on the RDA Axis 1, including calcium, zinc, and phosphorus. Local fishing houses were all built very close to the shoreline, and naturally occurring shoreline mussel shells may be enriching soils at local wood houses in a way similar to their effects at shell middens. However, hemlock was not found in other shoreline plots in as great abundance as at the houses of family fishing places. The diet of local fishing families may help create the soil conditions that structure plant communities of these built environments. Fish was a dietary staple common to everyone in the fishery, but there were differences in the diets of Newfoundland fishermen and Makkovimiut families. Apart from fish, commercial crews subsisted almost entirely on canned foods brought aboard their schooners from Newfoundland, whereas Makkovimiut have much more varied diets that included seal, waterfowl, and duck and gull eggs. Eggs are repeatedly taken from nests in June to cause the ducks and gulls to re-lay, and families formerly preserved eggs through the summer by covering them in dry salt (Aunt Annie Evans 2016). Aunt Annie Evans describes how there was a week's pause in the codfishing season, just after the codtraps had been taken up and before the family started to catch fish by jigging. During this week, her father

Eddie Andersen would hunt seals for food and bring the seals back to their fishing place at October Harbour. Bones from seals and ducks, as well as shells from eggs, were disposed of next to the house (Aunt Annie Evans 2016), enriching the soils of family fishing places with calcium, zinc, and phosphorus.

4.4.2.3 Sod houses and unknown structures

The plants of sod houses are species that respond well to disturbance and enriched soils: bumblebee flower, Labrador grass and hemlock (Tesky 1992, Haines 2011). Labrador grass is particularly favoured by disturbance that exposes mineral soils (Beaudry et al. 1999), and by decomposed organic soil (Lieffers et al. 1993), and may persist almost indefinitely once established (Tesky 1992). Species that are intolerant of disturbance, such as blackberries, were nearly absent from sod houses, even though the areas surrounding sod houses are predominantly heath. None of the species of sod houses were dominant to the extent seen at the wood houses of commercial fishing sites, where willows (*Salix glauca*) were dominantly abundant. A unique find at sod houses was the sedge *Carex nigra*, a new record for Labrador north of 54°N (Jacques Cayouette, personal communication, 5 June 2015). *Carex nigra* was more abundant at sod houses than at any other plot type. This sedge is typically found in wet meadows and tolerates a wide range of soil pH (Lansdown 2014). Although it is not specifically a calciphile, at its northern range limit in Labrador it appears to grow well in alkaline and calcareous soils. There were no clear patterns for species or environmental variables at unknown structures, which appear to be intermediate between the conditions at the two types of wood houses, as well as sod houses. Some of these buildings may be the communal Inuit houses dating

from the 17th century (Woollett 1999). Others appear to be family fishing homes or out-buildings from the commercial fishery.

4.4.2.4 Middens and gardens

While all three midden heaps showed significant increases in soil nutrients and shared similar vegetation communities, enrichment seems to be from different sources. The midden at the commercial fishing site of West Turnavik contained mostly fish bones, whereas the two other middens contained mostly mussel shells and seal bones, reflecting differences in diet at these sites. Comparatively elevated levels of phosphorus and zinc at the West Turnavik midden are likely due to the fish bone contents. Similar phosphorus enrichment is found at stages, where fish were processed and where excrement from fish-fed gulls would contribute to on-shore nutrient enrichment (Wright et al. 2010).

Phosphorus enrichment is also found in garden soils that were fertilised with fish water. Although it was found in limited abundance at calcium-rich sod houses, the calciphile *Draba incana* was only truly abundant at the West Turnavik midden, suggesting that it is responding more to phosphorus enrichment than to calcareous soils. Therefore, abundant *Draba incana* growth may be an indicator of fish middens, specifically.

The other significant difference in vegetation between the fish bone midden at West Turnavik and the shell/seal bone middens is the absence of hemlock at the fish bone midden. Hemlock is found in abundance at the two other middens, as well as at sod houses and wood houses of family fishing areas. The presence or absence of this species appears to be an exclusive footprint of Makkovimiut and their ancestors at built environment structures.

4.4.2.5 Introduced species and richness

As nutrient-rich environments, middens support species with a broader range of nutrient requirements than nutrient-poor heath soils, and are more species-rich than heath communities. Middens and soils around settlement areas can therefore support introduced and ruderal species (Karalius and Alpert 2010, Closset-Kopp and Decocq 2015). We found two introduced species that persist exclusively on middens: chickweed (*Stellaria media*) at the West Turnavik midden and *Vicia cracca* at a Long Tickle midden.

Chickweed may have been introduced through imported garden soils during transplanting, possibly of the rhubarbs that are said to have been brought to West Turnavik by Captain Bartlett (Annie Evans 2015d). An alternate explanation is that seeds were present in the sand ballast that was carried in schooners coming directly from England. Ballast has been the source of introduced species at other places in the province (Bain and Prevost 2010). In the case of West Turnavik, it's known that some of the sand ballast was brought ashore to use as fill on the island (Aunt Annie Evans 2016). It is a testament to the hardiness of this one patch of chickweed that it has persisted where no other introduced species (save rhubarb) have. It's not clear how *Vicia cracca* was introduced at the Long Tickle midden, where it is currently thriving and is very busily attended by nectaring bees. Long Tickle has an excellent harbour and many schooners from Newfoundland once moored there while their crews fished for cod, or bought codfish from local fishing families. It's more likely that any ballast was simply dumped in the harbour rather than brought ashore, as nearshore areas are too shallow for schooners to approach directly. It's possible that seeds were tracked in on the boots of

Newfoundland fishermen who came ashore by punt (small boat) to buy fish from local families, or that seeds were inadvertently carried in bags of potatoes that would have been traded.

Similarly to middens, gardens also have high species richness among plot types, especially when compared with plots of similar total area, such as sod houses. Overall species richness in gardens benefits from the inclusion of boreal species, which are found on mainland gardens. In addition, species richness is likely increased through additions of nutrients such as phosphorus, zinc and manganese from kelp, fishwater, and capelin fertiliser. Tillage at gardens is not as deep as the excavations at sod houses, which may prevent Labrador grass becoming as dominant at gardens as it is at sod houses.

4.4.2.6 Understanding hidden stories

In addition to site-wide changes in soil chemistry at commercial fishing stations, there were also interesting changes to soil chemistry at the plot level that told very local stories. For example, copper soil levels were twice as high in a single garden plot at Big Bight (34.56 ppm) as at all other plots, with the exception of the midden heap at West Turnavik (26.69 ppm). The source of this enrichment could have been a copper kettle from the nearby winter family home. Copper items such as kettles were valued European trade goods in Labrador (Cadigan 2013). The soils around tent rings were also unexpectedly high in aluminum, with the second highest reading of any plot type (576 ppm). Although very similar in plant communities, heath plots were much lower in aluminum (112 ppm). One explanation is that harvesters at tent rings were using aluminum pails, cooking pots, water dippers, and cups. Lightweight aluminum pots and containers would have been

practical items to bring during travel, when harvesters had to think carefully about what to carry with them. Aluminum products would have been preferable to heavier cookware made of cast iron or bronze. Aluminum cookware was only first commercially available at the end of the 19th century (Rock 1971), so although there is no living memory in Makkovik of harvesters using skin tents at tent rings, elevated levels of aluminum in tent ring soils may point to continued seasonal use of these tent ring sites into the twentieth century.

Sometimes we misheard the stories told by plants, especially when they did not directly respond to changes in soil chemistry. In some instances, vegetation communities that appeared undisturbed were shown to have anthropogenic influences. Soils at tall shrub plots were high in aluminum (801 ppm), which strongly suggests that they are areas of human disturbance that have become afforested in the absence of sustained seasonal fishery activities. Several low shrub plots were closely associated with wood house plots in the PCAs. Were these low shrub plots actually responding to undetected human activities? Based on similarities with heath vegetation, tent ring sites initially appeared to be good reference sites for areas of low-impact harvesting presence. Only in looking at soil chemistry did we learn that visibly undisturbed vegetation communities sometimes belie past site histories.

4.5 Conclusion

Understanding complex relationships among plant communities, soils, and overlapping human histories is challenging, and requires planning, interpretation and communication across multiple disciplines. We recognise that there is still much work to be done in

understanding the multiple biological processes and cultural practices, both historical and contemporary, that contribute to shaping plant communities and soils in these areas near Makkovik. This work is a first step towards articulating some of the ecological stories of a peopled northern landscape, particularly the urban ecology of northern Labrador.

We find clear legacies of people in the plant communities of northern built environments, both in the presence and absence of species. Built environments near Makkovik have higher abundance of bumblebee flower (*Chamerion angustifolium*) and Labrador grass (*Calamagrostis canadensis*). The abundance of *Stellaria borealis* at built environment plots indicates a combination of mechanical disturbance and nutrient enrichment. The relative scarcity of blackberries (*Empetrum nigrum*) at built environments is testament to the effects of human trampling and soil compaction.

Plants are able to further differentiate between the built environments of commercial fishing places and family fishing places. The wood houses of commercial fishing stations are overgrown with willows (*Salix glauca*), while hemlock (*Angelica atropurpurea*) grows at the homes of local fishing places. These species speak not only to structural variations in these two kinds of wood houses—the greater amount of decaying wood at the bunkhouses of commercial fishing stations—but also to the differential effects of cultural practice in structuring plant communities. Willows thrive at the old commercial bunkhouses in the high salt environment of salt fish and imported canned foods, and hemlocks grow in the calcareous environments created by bones and eggshells from diets of Makkovimiut. Hemlocks are also present at the sod homes and middens of the ancestors of Makkovimiut. When different built environments co-occur at the same

site, such as the sod houses and bunkhouses at the commercial fishing site of East Turnavik, vegetation and soil signatures at the site level become muddled.

Plants are not always able to tell the story of people in the landscape. Plant communities at tent rings are indistinguishable from heath vegetation, even though nutrient levels are higher at tent rings than in neighbouring healthland plots. The legacy of metals in the soils of commercial fishing stations has little effect on structuring plant communities, but the enduring presence of iron, zinc and copper tells the story of the barking pots, mooring rings, barrels, and copper nails that supported an entire industry. The presence of metals in the soils of tent rings and gardens reminds us that small family stories are also detectable in the historical record if we but fine-tune the way we listen for them. Detecting soil metals in seemingly “undisturbed” plots tells us that just because we cannot see human footprints in the landscape does not mean they are not there.

Like an echo of the questioning voices from other regions, we find ourselves wondering about the concept of a reference habitat or “baseline” against which we measure anthropogenic change (Stahl 1996), even in regions considered as remote and unpeopled as Labrador. Even if undisturbed areas do exist in northern Labrador, developing a disturbed vs. undisturbed sampling design based on plant community indicators is problematic if *a priori* plot selection can’t reliably separate one area from another. The tenet in the Inuit Land Use and Occupancy Study that “Our Footprints are Everywhere” (Brice-Bennett 1977) can be taken much more literally if we only appreciate that historical footprints are not always visible to eye. Thousands of years of activities along a peopled coastline have created footprints that are indeed sometimes visible in plant communities, but are often cryptic and encoded in soil chemistry. In

fixating on false dichotomies of disturbed and undisturbed, we may be missing opportunities to shift our inquiry to continuums of connections between systems that are neither exclusively cultural nor ecological, terrestrial nor aquatic.

Research in plant ecology can make insightful contributions to our understanding of people-plant relationships, but only if it remembers the cultural origin of landscapes. Knowing the cultural histories of sites and regions is vitally important in understanding how plant communities respond not only to biological processes, but to historical and ongoing cultural practices at both broad and fine scales. Ecologists therefore need to learn from the custodians of cultural histories and the practitioners of cultural practices. This will mean devoting more effort into building long-term research partnerships with Indigenous communities, and working on ecological questions that have meaning and value for Indigenous communities. This research project would not have been possible without Makkovimiut plant mentors and guides, from whose knowledge research questions, site selection, and interpretations all emerged. Together, we are able to hear, understand and share some of the stories plants and soils tell about people.

5 Chapter: Conclusions

5.1 General reflections

Originally, I had thought that an understanding of people-plant relationships could be more broadly understood by listening to people and listening to plants; that is to say, by hearing cultural perspectives on plants, and by listening to ecological stories as expressed in plant communities. This idea now seems almost quaintly binary, in the sense that it approaches relationships as from two opposite and discrete sides of the same coin. What has instead happened through the course of this work is that the two sides have become a lot less separate and distinct. The stories told by Makkovimiut about cultural values, such as respect for Elders and neighbours and the importance of sharing, were told in the context of active plant practices, such as wooding. Wooding happens in both an ecological context (the woods, modified by harvesting) and a cultural context (a family wooding place). The practice of wooding is the basis for promoting cultural values (e.g., respect for neighbours) and ecological values (e.g., water quality). Similarly, the ecological stories told by plants at fishing places are also cultural stories, stories of people in the landscape. These are the broader thematic stories such as the plant communities specific to particular types of built environments, and the more individual stories requiring an informed historical imagination, like the lingering detectable signatures where an aluminum drinking cup might have been mislaid next to a skin tent. The dual narrative, the cultural stories and the ecological stories, start to speak if not in tandem then in a type of duet.

This research involves many relationships, all as intertwined as the cultural and ecological narratives of people and plants. There are relationships between Makkovimiut

and the plants of Makkovik. There are the relationships that Makkovimiut have with each other that are enriched by plants, such as when people share berries, or respect the harvesting areas of their neighbours. Plants and plant practices weave other relationships together: for example, when blackberry sod is used to smoke trout, or when snowshoes made of juniper help make wooding possible in springtime. There are relationships between fishing places, plant communities and soil nutrients, between past practices and present-day landscapes, between terrestrial and aquatic systems, and between cultural knowledge, ecological research, and the cultural knowledge that interprets ecological research. There are relationships between people and places, plants and memory and story. There are also relationships between myself, as a visiting researcher, and Makkovimiut plant mentors and their families, as well as the knowledge, ideas and feelings we share with one another. There are relationships between institutions, universities and governments, and the people who work at the heart of them. There are relationships between mentors and students, both in the university and in Makkovik.

Recognising, respecting and strengthening relationships is a key condition of working within Indigenous methodologies. In practical terms, it has been important to strengthen relationships with individual Makkovimiut plant mentors and with Makkovik as a community through an iterative research process, from inception through analysis, and through contributing to community life. A significant part of going as a learner in this work was in trying to understand how to work towards more than content, more than the specifics of Makkovimiut plant knowledge or the plant ecology of family places. Going as a learner meant focusing on the means to learning, on methodology. Part of the significance of this work has been in learning how to better understand people-plant

relationships in ways that were culturally relevant and that built relationships: open-ended conversations, walks, apprenticing, attending. I learned, too, that learning has its own pace, its own schedule and sometimes even its own plan. Questions I was not ready to ask were ultimately more appropriate at later stages of research, when the relationships were ready to support the questions and the answers for everyone involved. Timing was also important to the development of ecological questions, in that cultural learning had to precede ecological learning to ensure that ecological questions were informed and relevant. I had to laugh when I realised that early misunderstandings about the subject of my research had worked their way into a central place in my ecological questions. When I first visited Makkovik and asked people what kind of research they would like to see on plants, I often heard quite a lot about the Makkovik fish plant before I could clarify that I was interested in trees and flowers and not fish. When cultural plant knowledge started to turn my attention to the plants of fishing places, it seemed like the universe had not only a circular operating plan, but also a circular sense of humour.

5.2 Critiques and limitations of the work

5.2.1 Methodological critiques

Relationships connecting people and plants are extensive, complex and rich. In recognition of these relationships, I tried to work in such a way that would allow voices of people and plants to be heard. In my view, this has meant respecting the very personal and wide-ranging narratives of Makkovimiut plant mentors, working iteratively in a circle of discussion/verification/analysis, spending time attending (Bawaka Country et al. 2015) to day-to-day life with plants in Makkovik, and working to understand the

ecological narratives of plants through research in ecology that is guided and interpreted by local knowledge. Equally important, it has meant trying to develop and enrich relationships with Makkovimiut: being useful in Makkovik through contributions to programs and events, maintaining professional and personal communication, and often just being a human being amongst friends. These commitments and this approach to respectful learning take time. They also require a broad and interdisciplinary approach that weave together the obligations of respectful work with the insights and methods from different academic disciplines, such as ethnobiology and ecology.

A broad and interdisciplinary approach can be a benefit to research, especially when the research is exploratory and adaptive (Bhattacharyya 2012). In her own work, Weber-Pillwax reminds herself to take the broadest possible approach to her research process to ensure unknown avenues for learning are not excluded (Weber-Pillwax 2001). In Makkovik, a broad approach was necessary in responding to the community priority of documenting Makkovimiut cultural plant knowledge, as this had never been done and no single individual knew the extent of a collective knowledge. A broad approach meant trying to draw on all available guidance, community-based and academic, for how to learn and where to look for insight. In Makkovik, I have as a learner leaned very heavily on the knowledge of my community advisor, Carol Gear, and my guides, Todd Broomfield, Sheldon Andersen, and Errol Andersen, in understanding appropriate methodological approaches both in working with Makkovimiut plant mentors and in interpreting the plant ecology of cultural places. I have been guided by the knowledge and experience of my academic committee. I have also read from Indigenous methodologies, ethnobiology, plant ecology, historical ecology, plant management,

botanical history, anthropology, geography, and regional literature. Striving for breadth is simultaneously a methodological necessity and a methodological critique. In weaving such a wide net for learning, and in casting it so broadly, my net did not settle very deeply anywhere for very long in any one academic field. A broad approach can be a severe limitation to a sufficiently deep understanding of context, methodology and literature, which has implications for how successfully research design and analysis is able to be informed by existing work, as well as how proficient one is in discussing findings in a broader scholarly context.

The negligence of researchers to draw on the expertise of their peers in other disciplines was raised very early in the field of ethnobiology by Castetter (1944), who bemoaned that anthropologists had no training in biology, and that biologists made lists of species without relevant cultural context. Castetter doesn't specifically attribute narrow professional fields of vision to time constraints, but it stands to reason that as disciplines acquire more practitioners, more studies, more history, and more literature, it becomes increasingly difficult to master a single discipline, never mind two or three. And yet complex questions require complex and varied skill sets, which is why multidisciplinary collaborations in fields like historical ecology are so necessary. Even still, researchers whose interests sit between camps still talk of having to spend their professional careers engaged in "shuttle diplomacy" (Crumley 2003, 1) in communicating their research to multiple audiences, and in advocating for it, as well. Time pressures in learning a diverse literature are compounded by community obligations, a struggle extensively discussed in participatory and community-based research (Gearheard and Shirley 2006, Laidler 2006, Mistry et al. 2009, Pearce et al.

2009, Kendall et al. 2011, Harding et al. 2012). I was attempting to complete a degree through an academic institution, and had obligations to the university, my department, my supervisor and committee. On the other hand, this academic degree rested entirely on the willingness of Makkovimiut to teach me. At many times, I have felt as though I have had to choose between trying to be a well-read PhD candidate and a respectful learner in Makkovik. You could say I was not just involved in “shuttle diplomacy” between academic disciplines, but between community and university, and between very different methodological foundations, relational expectations, and concepts of accountability.

A musician friend once told me that being a good singer was like being a duck on a pond: on the surface all appears graceful and effortless, while hidden from view is the frantic paddling that keeps the duck moving forward. When I first started research in plant ecology, I was amazed to discover that the tidy conclusions in scientific papers gave absolutely no indication as to the messiness and uncertainty of field work. I suppose the conclusion to a dissertation should appear effortless in its easy and flowing summation of all one has learned, with both the mental effort and messiness concealed from sight. But the truth is that writing this concluding section has been mentally messy. As I struggled to articulate conclusions, I had to ask myself: why is this so hard to write? Before addressing the more conventional type of conclusions one expects in this section, I think it is important to share some conclusions on conclusions themselves, and why they have been so challenging to articulate in the context of this particular dissertation.

First, as mentioned in previous paragraphs, I have developed a broad understanding of literature from multiple fields rather than a deep understanding of a single discipline. This makes me reluctant to make categorical statements about novelty and new directions

of the research, or to make critical statements about the research of others, as I do not feel as though I have a comprehensive enough overview of the literature to substantiate claims or critiques. Focusing on the holes in one's knowledge is not unique to interdisciplinary researchers, but moving between academic fields may heighten feelings of not being proficient in any discipline (Curry 2015). A cautious appraisal of one's own abilities to make academic critique leads me to my second point, which is that some Indigenous scholars see judgement-based conclusions as largely incompatible with Indigenous epistemologies (Wilson 2008). The "epistemological egalitarianism" in Indigenous discourse reflects a reluctance to judge or critique the conclusions of others because, in a worldview based on relationality, it is impossible to know the relationships that others have with ideas, or the relationships that have formed these ideas (Wilson 2008, 92). Third, by living in a highly interconnected region I can begin to appreciate that there are very practical social reasons for finding ways to be inclusive of ideas rather than critical of them. It is crucial that one is careful with words in daily life and in research, and that one avoids making generalisations or comparisons that involve neighbours, friends and family. Fourth, it is very difficult to academically position one's research findings while remaining humble. Janet Tamalik McGrath discusses how self-promotion is "highly taboo" in Inuit communities, and how it is "inappropriate to seek recognition for oneself directly; this recognition should come from others" (McGrath 2003, 8). She explains that many Inuit experience Western culture as being much more recognition-based in its encouragement for "putting your best foot forward" as a way of convincing others that one's work is evidence of one's worth (McGrath, 2003, 8). Perhaps if we attempted to model dissertations and academic manuscripts on Indigenous approaches to

learning, conclusion sections would not solely consist of researchers concluding on their own work, but would include the responses of others to the research. These would not be conclusions made on behalf of authors, but would be reflections from readers on the meaning they had found in the work. Such a model would bring this dissertation fully into the iterative approach it espoused as a methodological tool. This alternate approach to conclusions brings me to a related fifth point, which is that in Indigenous methodologies it is the responsibility of the listener (or the reader) to derive what is meaningful in story (Stevenson 2000, Wilson 2008). In story, there is an emphasis on interpretive teaching rather than on declarative teaching (Stevenson 2000), and developing one's own relationship with ideas is how one learns.

Finally, one of the central struggles to make conclusions in this section stems from my reticence to describe collective knowledge as “new” knowledge, and to personally nudge out a position for this “new” knowledge as if I have produced it. I have drawn closer to the idea in Indigenous methodologies that knowledge is not individually owned, but is “shared with all of creation” (Wilson 2001, 277). If I now know how to make a smoke pot, it is not because this is *my* knowledge. Aunt Annie Evans shared this knowledge with me (Aunt Annie Evans 2013d), and someone earlier shared it with her, and no one knows for sure where that knowledge began. One could say that the knowledge simply exists, and is alive when it is shared in through practice and story. If knowledge already exists, then it is difficult to describe findings from research as “new.” As an example, take the finding in this research that plant communities and soils around Makkovik reflect the historical presence of people in the landscape. This knowledge already exists in the cultural understanding that the footprints of ancestors are

everywhere. It also exists in the ecological sense, in that Makkovimiut know that hemlock (*Angelica atropurpurea*) grows exceptionally well at sod houses. I have simply used ecological methods as an alternate tool to tell the same story and contribute a slightly different voice to a shared knowledge.

For analysis in the context of this dissertation, I have tried to work according to the belief that a shared knowledge requires a shared approach to analysis. In practical terms, this has meant working with Makkovimiut plant mentors, community advisors and guides to identify the collectively meaningful themes in the shared stories of people and plants. However, in the words of Gegeo and Watson-Gegeo: “Anthropological accounts of other people’s cultures are not Indigenous accounts of those cultures” (Gegeo and Watson-Gegeo 2001, 58). This is ultimately my account of plants in Makkovik. I have tied myself in knots trying to understand what right I have to edit and interpret these stories. It is a limitation of my position as a visiting researcher, one I did not fully appreciate until it was too late and I had already begun. I can understand why some non-Indigenous scholars have made the difficult decision to not work within Indigenous contexts over concerns of speaking to things they don’t know (Aveling 2013).

The limitations of non-Indigenous researchers in working within Indigenous methodologies begs several questions. Should non-Indigenous researchers attempt to work according to Indigenous methodologies if they can only do so in a limited capacity? I believe there are good reasons to try. I agree with Louis (2007), who writes that Indigenous methodologies will help “Non-Indigenous researchers [possess] the tools they need to ensure their research agendas are ‘sympathetic, respectful, and ethical’ from an Indigenous perspective” (Louis 2007, 134). I understand that I face limitations in my

ability to work within Indigenous methodologies. These limitations are also opportunities. There is an opportunity to learn. There is also an opportunity to stretch. Indigenous scholars have had to do just that, to find ways to work as intermediaries connecting their communities to universities while maintaining relationships in both. Non-Indigenous scholars need to stretch in the same way, to learn the protocols, behaviours, and ways of relating and communicating that will make them welcome in Indigenous communities, while recognising and advocating for Indigenous methodologies in their own academic departments.

To develop tools that will build the “sympathetic, respectful, and ethical” research envisioned by Louis, non-Indigenous researchers will need mentors who are Indigenous scholars and community advisors. But why should Indigenous scholars choose to be mentors to non-Indigenous researchers, when they are already responding to questions of “are you helping us?” (Kovach 2005, 31) from their own peoples? If we would like to go as learners to Indigenous mentors, non-Indigenous researchers will need to ensure our research objectives are relevant to communities, and that community priorities are reflected in research. Perhaps if we go a bit more humbly as learners, we might start to warm the currently tepid welcome for Indigenous scholars in the university, and we might not only find existing mentors, but welcome new ones.

5.2.2 Cultural plant work critiques

I was unsuccessful in asking as many questions about relationships with plants as I had optimistically envisioned. Partly this is due to the open-ended nature of the discussions and out of respect for how Makkovimiut plant mentors wanted to direct the conversation;

and of course partly this is due to my inexperience and caution as an interviewer. As a result, transcription time was significant, not always precisely on topic, and took time away from other work such as additional interviews. However, it may be that greater insistence on topical discussion would have in fact caused setbacks to fledgling relationships and ultimately resulted in fewer opportunities to learn about plants. Certainly not all methods were successful in encouraging plant mentors into discussions about plants: for example, I overestimated the amount of group discussion time that berrypicking would provide, without a practical understanding that people tend to scatter while berrypicking and are more focused on picking berries than talking about them. Again, what is a limitation in a method and what is a strength is not always so cut and dry, as tea breaks during berry-picking were wonderful opportunities to discuss plants.

5.2.3 Plant ecology work critiques

The experimental design suffered from a lack of replication. There were too few replicates of many plot types, both built environment plots and undisturbed plots, and this negatively affected the power of the analysis. Increasing the number of plots would potentially bring more clarity to vegetation-soil relationships in plot types where replicates were few. Increasing the number of surveyed sites would have also provided more insight into site-level trends in vegetation. I would have liked to include traditional winter homes as a site category, but was unable to work at these sites due to time and weather. Fundamentally, there is an inherent problem in using *a priori* habitat descriptions to delineate plot types, especially since anthropogenic effects on soils were discovered in plots that were seemingly undisturbed. Ideally, I would have liked to

include bryophytes and lichens in the vegetation surveys, especially since lichens and bryophytes are known to respond to human disturbance in the North (Forbes 1994), but was unable to survey them due to time constraints.

5.3 Potential areas of future research

Many research priorities on the topic of people-plant relationships have already been identified by Makkovimiut during preliminary research for this work. These research priorities can be found in Appendices A and B, and are broadly summarised below:

- Research on new sources of local wild foods and medicines
- Ways to improve accessibility of wild plant foods
- Integration of cultural plant knowledge into school curriculum
- The effects of invasive species on local ecosystems
- The effects of development and climate change on local plants
- Increasing local food production
- Reinvigorating gardening traditions
- Investigating the potential for commercial production of local plant species

The following list details other aspects of people-plant relationships that are potential areas for future research:

- *Animal-plant relationships*: The relationships between plants and animals, such as geese, partridge (ptarmigan and grouse), bears, and fish, were frequently mentioned by Makkovimiut. It would be valuable to focus on learning more about the role of animals in the relationships that connect them to people and plants.
- *Nutritional value of plant snack foods*: Many plants in Makkovik are eaten on a limited seasonal basis, and often as snacks supplementing meals: for example,

uKaujak (willow buds), kutsuk (spruce gum), and the roots of saltwater grass (*Leymus mollis*). There is much important work to be done on the nutritional and physiological value of these plant foods.

- *Plants and contamination*: Many Makkovimiut are reluctant to harvest plants close to town over concerns that harvesting areas may be contaminated with gasoline, oils, and dog excrement. These concerns limit the availability and accessibility of plant harvesting for residents. Applied toxicological research on the possible contamination of plants by would be welcome in addressing concerns around the safety of plants harvested in town.
- *Toxicology of locally poisonous species*: There are historical accounts of poisonings in Makkovik from *Angelica atropurpurea*, locally known as hemlock. *Angelica* spp. are important plant foods in other parts of the North (Kuhnlein and Turner 1991, Rautio 2014). Toxicological research would help clarify whether strict warnings in Makkovik about this species are related to the part of the plant used or its preparation.
- *Ecological effects of plant harvesting*: To advance our understanding of the effects of cultural practices on landscape, it would be helpful to look at some of the measurable effects of cultural plant harvesting on plant populations and landscape. Example of such research might include how harvesting of blackberry sod for smokehouses changes microtopography and hydrological conditions, and the effects of these alterations on plant communities and species richness; and how selective harvest of particular tree species affects forest stand composition. It would also be helpful to look at the effects of harvesting on the physiology and

population health of particular species, including saltwater grass (*Leymus mollis*), tulligunnak (*Rhodiola rosea*) and uKaujak (buds of *Salix* spp.). These research topics might establish links between cultural harvesting practices and plant health, as has elsewhere been shown (Anderson 2005).

- *Archival research*: For archivists and botanical historians, a review of global herbaria specimens in search of labels containing Inuit plant knowledge would be invaluable in adding to historical Inuit plant knowledge for Labrador. Relatedly, a thorough review of Moravian documents for anyone who reads German script would certainly yield much historical Inuit botanical knowledge, and possibly so too would a review of the logs of schooner captains. There has yet to be a systematic review of Moravian gardening practices in Labrador (H. Rollmann, pers. communication, 17 February 2016).

5.4 Research contributions

5.4.1 Community contributions

I believe this research has been of benefit to Makkovik as a community in documenting Makkovimiut cultural plant knowledge, and in helping to create a lasting community archive of this collective plant knowledge. This documentation is a key step in making Makkovimiut plant knowledge more accessible within Makkovik, and more available for application in future programs in health, education and tourism. Documenting Makkovimiut plant knowledge has also been of benefit to individual families in creating a written and audio record of family-specific stories. Through presentations, workshops, radio, children's programs, music, and photography, individual plant knowledge has been

given the chance to recirculate in Makkovik and to become more widely and collectively known and practiced. Work in plant ecology has contributed to existing knowledge about family places, and added a new perspective to these site histories through the voices of plants and soil nutrients. The work has also supported training opportunities in plant identification and plant ecology field work for a Makkovimiut undergraduate student, as well as employment for two guides, workshop instructors and assistants, a historian, a photographer, a musician, craftspeople, and caterers, all of whom are Makkovimiut. I think back on Carol's advice that it is important to give Elders opportunities to share their knowledge, and I believe this work has provided opportunities for Elders to share knowledge with me, as a visiting student, with each other, and with youth and other Makkovimiut. We continue to work on the long-term goal of a Makkovimiut plant book, which will present Makkovimiut cultural plant knowledge for the full range of species in Table 1, and build on themes discussed in Chapter 3. This plant book will also focus on the plants of family places in the context of more detailed family histories at these places.

5.4.2 Academic contributions

5.4.2.1 Contributions to Indigenous methodologies

Many of the methodological insights I have gained from this work are rooted in the advice of other scholars. I acknowledge Eber Hampton's teachings that we must explore our own personal reasons for research, and inquire deeply of ourselves to publicly acknowledge and articulate why we are drawn to particular paths of research. In my experience, this not only ensures that a researcher will bring effort and heart to their work, but being open about personal meaning will also help build relationships with

others who find similar meaning in the work. I acknowledge Margaret Kovach's teachings that research must find ways to combine this personal meaning with community relevancy. In my case, this has meant basing my learning in my own geographical region, learning from both people and plants, and directing my learning in service of community research priorities. As we communicate research in academic writing, it is important to include reflections on the personal relevancy of the research, as well as describe the ways in which community relevancy was interpreted. In instances where it is not appropriate to share methodological detail in print, I believe it will be helpful if researchers make efforts to speak with one another directly, which will also help to build relationships. If researchers choose to share their work in written form, it is important that writing be accessible and thoughtful and consider all readers, including Elders and generations to come.

I acknowledge Carol Gear's insights that visiting researchers must rethink how they seek consent, and that consent needs to be given not only at the beginning of a research relationship, but also iteratively throughout it. An iterative consent process goes hand-in-hand with a circular model of discussion, verification, and making meaning, wherein both consent and content are constantly refined and renewed. Thinking in circles is also extremely helpful in making sense of the network of relationships that encircle not just plants and people, but cultural practice, history, and cultural and ecological communities. If researchers choose to work in an iterative framework, it will require reflection on the effects of distance and visit frequency on learning. It will also require reflection on the time required in this approach, and the effects of time in developing relationships, asking questions at the appropriate pace, and learning through attending.

5.4.2.2 Contributions to understanding plant knowledge in the North

This work helps tell the story of people-plant relationships in the North. It contributes to the growing literature and understanding that plants are indeed culturally important to northern peoples (Dritsas 1986, Ootoova et al. 2001, Blondeau et al. 2010, Jones 2010, Cuerrier and Hermanutz 2012, Ziegler et al. 2013). The stories Makkovimiut tell about plants—how plants are cared for through transplanting, tending and weeding, and through harvesting practices—contribute local voices to a larger discussion about the cultural origins of landscapes in Labrador (Lemus-Lauzon et al. 2012, Roy et al. 2012, Roy et al. 2015). The stories of Makkovimiut plant mentors bring northern landscapes into focus as places where cultural practices have both historical and contemporary roles in shaping landscapes. When Makkovimiut voices speak in tandem with the stories plants tell about people, the ecologically-detectable effects of cultural practices, this shared narrative becomes even more vivid.

In listening to the stories Makkovimiut plant mentors tell about plants, it has become apparent individual species, such as blackberries, are present in diverse parts of life in Makkovik, from smoking fish to dyeing grasswork, and that working with individual species requires diverse knowledge and skills. Berries are more than food objects: they are part of a highly interconnected network of relationships. They connect people to animals, birds, places, and other plants. They support other cultural practices, such as fishing, that in turn support plants. Plants connect Makkovimiut to memory and place, and relationships with plants promote opportunities for learning, for healing, and for strengthening social values such as sharing. Even in small quantities, plants are vitally important for nutrition and physiological health.

Plant harvesting practices in Makkovik protect ecological values, such as water quality, fish habitat, and forest health. Harvesting practices for particular species such as saltwater grass (*Leymus mollis*), tulligunnak (*Rhodiola rosea*) and uKaujak (buds of *Salix* spp.) have potentially positive effects on populations of these species. One of the most meaningful lessons from Makkovimiut plant mentors is that caring for plants is related to caring for community. Harvesting practices in Makkovik demonstrate a concern for the family places and work of neighbours, and the social obligation to share harvests ensures that Makkovimiut are continuously aware of and responsive to the needs of others. Plant practices ensure an interconnected, respectful and caring community.

An important lesson from this work is how necessary it is to understand plants in practice, rather than as individual objects. Practice is the language through which cultural and ecological values are expressed. This is especially true in communities where both the specific harvesting skills and the norms of respectful behaviour are learned by doing, and where rules governing respectful harvesting are therefore often unspoken. Being aware of both practice and language may help external researchers understand why critical aspects of people-plant relationships are not always evident in direct questions about “management”. A better understanding of Indigenous perspectives on people-plant relationships will give better insight into why concepts such as “caring for plants” will generate more insightful discussion than “plant management”. Again, it is important to focus on the practice of relationships with plants, rather than plants as objects: not only is this more in keeping with Indigenous perspectives on plants, but it helps to highlight the importance of plants as facilitators of culture and values.

5.4.2.3 Contributions to plant ecology

Through an ecological narrative, the voices of plants and soils tell a story of people in the landscape in the areas around Makkovik. The plants and soils of fishing places express the ecological legacy of a peopled northern landscape, and add to Makkovimiut voices, Nunatsiavummiut voices (Brice-Bennett et al. 1977), regional voices (Lemus-Lauzon et al. 2012, Roy et al. 2012, Roy et al. 2015) and northern voices (Forbes 1996, Hadley et al. 2010a, Hadley et al. 2010b, Michelutti et al. 2013) in our understanding of the cultural origins of landscapes in northern regions.

Nutrient enrichment in the soils of tent ring sites speaks to the chemical as well as physical alterations that the ancestors of Makkovimiut made to their land. Nutrient enrichment and soil metals also speak to the history of commercial fishing stations that formerly operated in the region. At these commercial sites, the concentration of iron, copper and zinc in soils is a vivid reminder of a vast industry that required barking pots, grapples, and mooring rings; and copper for barrel hoops, boat nails, and kettles. The stories of people of these fishing stations speak in the presence of these soil metals, and also in the reduced abundance of plants such as blackberry (*Empetrum nigrum*) that are sensitive to mechanical disturbance and trampling. At places where different peoples, Inuit and visiting fishermen, have left physically visible legacies in the built environment of sod houses and wooden bunkhouses, the patterns in the stories told by plants and soils become intertwined and difficult to hear, like two conversations happening simultaneously.

The northern built environments in the areas around Makkovik share three distinct species: *Angelica atropurpurea*, *Stellaria borealis* and *Draba incana*, which are different

from disturbance-species reported elsewhere in northern Labrador (Roy et al. 2012).

These species are more frequent and abundant at built environments than undisturbed environments, and thrive in environments with soil disturbance and nutrient enrichment.

Angelica atropurpurea, known locally in Makkovik as hemlock, could be described as the footprint of Makkovimiut and their ancestors, as it grows at family fishing places and sod houses in the calcareous soils nourished by seal bones, duck eggs, and gull eggs from the diet of local peoples. The former bunkhouses of commercial fishing stations now support willows (*Salix glauca*), which are tolerant of soils high in sodium, potassium and magnesium. These changes to soils are likely from the quantity of decaying wood and from the salt used in salting codfish, as well as salt from canned foods and cooking water.

Introduced species like *Stellaria media* and *Vicia cracca* are restricted to nutrient-rich midden heaps, and persist only at these built environments. Makkovimiut knowledge of the likely vectors for these introductions, including ballast transfer and trade items such as potatoes, has allowed these highly localised stories to be told and interpreted. The stories of Makkovimiut have supported the voices of plants in giving historical and family context to an ecological narrative. And although this work demonstrates that plants can indeed act as footprints of human activity, it also demonstrates that not all plant communities respond to altered soil nutrient levels, and that plants cannot always be depended upon as primary indicators of cultural effects. For some of the more hidden stories in the landscape, Makkovimiut have provided the context in which soil values can also tell a story. This combined narrative has helped to explain that elevated aluminum levels at tent rings could be from aluminum cookware and cups, and that the high copper readings in garden soils may come from copper kettles. In establishing that cultural

effects on landscape can be both visible in plant communities and hidden in soil nutrients, the work adds to voices that call into question the utility of concepts like undisturbed baseline habitats.

I believe appreciating the cultural origins of landscape represents not just a practical shift with relevance for improving our understanding of the factors that influence the plant communities we see around us. For ecologists, I hope this work also demonstrates the value and in fact the necessity of developing ecological research that is bookended by cultural knowledge: developing research questions and methods that originate in cultural knowledge, and interpreting findings with community partners. For practical reasons, it is imperative that ecologists develop a better understanding of the cultural practices that affect plant communities and soil nutrients, so that they can work in more informed ways. Moreover, I hope ecologists will recognise that their work can be done in service to community interests, and that as a result their work will be more broadly relevant, informed, and respectful.

5.5 Hearing the shared stories of people and plants

In human communities, we sometimes strive to understand the perspective of others by looking at the world from their point of view. Shifting perspectives is a way of cultivating empathy and working towards better understanding and better relationships. I believe this work aspires to a similar goal. In listening to the stories Makkovimiut tell about plants, we come to appreciate that plants are part of an interconnected system of ecological, cultural and social stewardship. Relationships with plants are the way in which ecological, cultural and social values are practiced and strengthened.

Makkovimiut relationships with plants are a window on how a community has chosen to negotiate its place in the world. In trying to hear the stories plants tell about people, we come to understand that human relationships with plants and with landscape have reverberations through time. Ecology helps to decode some of the words and syntax of the language of plants and soils, but it is local knowledge of place and practice that turns these components of language into the voice and the stories of plants.

When we shift our perspective between these stories, the human narrative and the plant narrative, what we learn is that we are each telling mirrored stories about how important we are in each other's lives. The stories speak to the enduring effects of our relationships with each other in culture, and in landscape. The shared stories of people and plants start to soften the edges between these places, and help us understand how people and plants matter to each other. And more than that: when people and plants shape each other's lives, who we are is actually in relation to one another. There is a deeper philosophical shift that happens when we know that the woods, the heath, the grassland is not separate from us. Wilderness is a place we have collectively made with our partners rocks, soils, plants, animals, water, wind, fire, and time. Wilderness is a collaboration among all these parties. If we begin to recognise wilderness as the expression of our combined creative efforts, perhaps we will draw a bit closer to the belief that we all share agency as makers of landscape - and that in this way we are all kin. Perhaps it also means that as humans we will recognise more of ourselves in landscape, and feel a greater sense of belonging when we walk a trail and know that the ground still remembers the footprints of those who have walked before us.

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Appendices

Appendix A Research update newsletter 1 – English

The shared stories of people and plants

Learning about community priorities for plant research

Makkovik community visit: July 20–26, 2012 – Trip Report Erica Oberndorfer, PhD student (Carleton University)

Purpose of the trip

- The purpose of this trip was to speak with community members and learn about research priorities in Makkovik on the

topic of people and plants.

- This trip also provided an opportunity to visit different habitats in and around Makkovik, and to learn about plants in these areas. In particular, it was an opportunity to look at plants growing at archaeological sites.

Activities during this trip

- Met with Conservation Officer Errol Andersen, and with Janine Lightfoot at the Makkovik Inuit Community Government office
- Met one-on-one with community members to discuss research priorities in the community
- Hosted a meet-and-greet event at the community hall to introduce my research interests and learn about the research priorities of community members
- Hosted a community plant walk
- Developed a Facebook page (<http://www.facebook.com/pages/Makkovik-People-and-Plants/390594181000667>) to share project information with the community

- Walked the area to look at plants and habitats, and visited the new boardwalk
- Visited an archaeological site with Errol Andersen and summer students Jeannie Ikkusek and Charlene Gear
- Enjoyed the boat races, trout supper and dance!

Research priorities: findings

- In total, 14 people shared their thoughts on research priorities for Makkovik on the topic of people and plants.

- Research topics of interest to community members covered both wild and agricultural/horticultural plant species, as well as research areas involving a combination of wild and domesticated species. These community research priorities are summarised on the following page.

Trip report completed August 13, 2012

Makkovik community research priorities on the topic of people and plants:

Wild plants

- ❖ Increasing the use of wild plants as a sustainable local food source (new species, in addition to berries already being harvested)
- ❖ Documenting traditional knowledge about plants
- ❖ Documenting traditional plant medicines
- ❖ Developing a guide to plants for use on the land/in emergency situations
- ❖ Improving opportunities for people to access harvesting areas, especially for Elders
- ❖ Teaching about plants in the school
- ❖ Teaching students in an outdoor classroom: skills on the land, plant

- identification and use, survival skills
- ❖ Addressing concerns that young people are not learning traditional skills (e.g. harvesting, hunting)
- ❖ Effect of new and/or invasive plant species on indigenous species
- ❖ Effect of development on plants (e.g. berries)
- ❖ Effect of climate change on plants
- ❖ Developing a guide to local flowers

Agricultural plants

- ❖ Producing more food locally and being less dependent on food imports
- ❖ Recovering knowledge of gardening, reinvigorating gardening traditions and the practice of growing your own food
- ❖ Reestablishing the community gardens, and dedicating a full-time person to this project
- ❖ Learning about improving soils for horticulture
- ❖ Developing more local agriculture

Wild and agricultural plants

- ❖ Looking at former settlements/cabins/cultural sites on the coast: What was formerly grown there? What is still growing there? Could these species still be cultivated?
- ❖ Considering the agricultural potential of local wild species
- ❖ Developing local plant products as a community enterprise

Next steps

- I hope to visit Makkovik in late August/early September 2012 to spend more time looking at the plant species of archeological sites. I am communicating with Errol Andersen and Jamie Brake (Nunatsiavut Government archaeologist) about these site visits.
- I would be pleased to present these preliminary research findings during my next visit to Makkovik.
- I warmly invite comments and suggestions on the research priorities detailed in this report.
- I would like to continue working with the community towards refining a research project, based on some of the priorities identified here. Though no single project can address all these local priorities, I hope this summary can also be a useful tool for informing other research in Makkovik.

Thank you to everyone for making me feel so welcome in Makkovik. I am especially grateful to Carol Gear for her help in organising my visit, to Errol Andersen for his time and experience in showing me the area by boat, and to Janine Lightfoot for meeting with me to discuss research in Makkovik. I am also grateful to summer students Charlene Gear and Jeannie Ikkusek for introducing me to community members. Finally, I thank everyone who took time to speak with me about people and plants - Nakummek!

I gratefully acknowledge my research support:

Questions? Comments? Suggestions?

Please contact Erica Oberndorfer - email: / phone:

website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Appendix B Research update newsletter 1 – Inuttitut

Unikkausingit Inunnit amma Piguttingillu

Ilinniagatsait nunalinet maligatsangit piguttuit takunnâtaujunik

Makkoviup Nunalinga niukKuvigani : July 20–26 – NiukKuviga allasimavinga

Erica Oberndorfer, PhD ilinniajuk (Carleton Ilinniavialungani)

Summangât NiukKuviga

- NiukKusimalauttut uKâlagiattutluni nunaliginnut amma ilinniagiattutluni Kanuk ikajusongumangât maligatsangit Makkovimi Inunnginit amma piguttunillu.
 - NiukKuvigallu ikajuvalliausingit

pulâtîluni aippanginut inosijunik iluani amma nunagani Makkovik, amma illiniatutluni piguttunik nunagallani. ilatsajangit, ikajuvallialauttuk takunnâgiamik piguttunik pigujunik ujuganniavinni.

Pissisimajangit NiukKuvigani

- Ilitannatluni piulimajaugialinik kamajigialimik Errol Andersen, amma Janine Lightfoot Makkovimi Inuit Nunaliniqt Gavamangani illugusingani.
- Atautsigetluni nunaligigani ilanganik uKâlautittlutik magitgasanganit sivullipânganit nunatinni.
- tujummiuvitluni ilitannagiattutluni inunnit nunaligijunik Hâlingani uKautjigiattutluni suliat samaninik ama ilinniagiattutluni naffâsimajaminik maligatsangillu nunaligijunnt ilaliugutilinganut.
- tujummiuvitluni nunaligijunit takugiattutlutik piguttunik
- âkKisuitunillu taijaujumik Facebook pâginangani (<http://www.facebook.com/pâgina/Makkoviup> Inungit amma Piguttungit/390594181000667)

ilangapâgiamik suliataminik naffâsimajaminik nunaligijunnt

- Pisulauttuk nunavutinik takugiattutluni piguttunik amma inolivinginit, amma pisutluni sanattaumik pisuvitsaminik
- Pulâlauttuk ujuganniavialunik Errol Andersenillu amma Aujami suliaKajut suguset ilinniajut Jeannie Ikkusek amma Charlene Gearimi
- Kuviasulauttulu motakkonguagiattujuni sâlaKanguagiattujunik takugiattulauttuk, nigigiattutluni amma tâncinguagiattuluni!

Kinijatsangit sivullipât; Naffâlauttangit

- ilonnangani, 14–nait Inuit avatitsimajut unikkausimminik ikajutlunillu Kinijatsaminik sivullipânganit Makkovimi uKâlauttiKatlutik Inunnit amma Pigutunigillu.
 - Kinijatsangit sivullipângit piujolauttut nunaliginni ilaliugutilet uKâliutiKalauttut tamaptiminik nujuattak amma

suliat satausongujungit/pigusongujungit piguttuit ilangit, ammalugiak Kinijatluni nunaligani atjettujongujut ommajuit amma ommajuit atuttausongujunt Inunnut. Tapkua Kinijatsimajuit sivullipângit allatausimajut mâni:

niukKuviga pijagettutaujuk Aug 13, 2012

**Makkoviup Nunaligani Kinijatsatausimajut
sivullipāk UKâlautiligijuit Inuit amma
Piguttungit:**

Piguttungit

- ❖ lattugiallajut atuttaujunillu piguttuit nigijausot nunalinni niket aipangit(nutâk ommajuit,aipanganit paunganit atuttauligettunik piKuttauligettunik)
- ❖ Piuligijut ilukKusivunit Kaujimajattavut piguttuit
- ❖ Piuligijut ilukKusivut piguttut ejatsanik
- ❖ âKkisiutluta maligatsanik piguttunut atuttausongulâmatta nunanni/sollu

ikajuttaugiaKaligutta
ikajuttaugunnaligutta
❖ âKkisiugiallaltuta
pivalliasongulâgatta
inunnut tigimiatluta
aullâvigijavunit,
tapkuninga
InosuttuKainnut
❖ Ilinniatet sugusinnut
piguttunit ilinniavinni
❖ Ilinniatet sugusinnit
silami: pisongujungit
nunaliganni,

- sunaummangât piguttuit amma Kanuk atugiamik,
inosivullu pisongujunik
- ❖ Kaujimatitsitluta niviupugut tapkua inosittuit ilinniagtittut ilukKusivutinnit (sollu:kattitisiunik,pinasuagiattuk)
 - ❖ suggannattunik nutânik amma/sollu piungitunik piguttunik inosilunik nutângutunik aipanganik piguttunik
 - ❖ sugganattunik pigupputaujunik piguttuit (sollu:paungait)
 - ❖ suggunattunik silatsuani piguttunik
 - ❖ âKkisiutluni maligatsanik piguttunik nunani

Nigitausongujuit piguttuit

- ❖ pigugiasitlutik nikitsait nunani amma Kujanâttlutik niket tusojausimajunik
- ❖ isumajâniatlutik kanuk pigusivigiamik, utittitaunialimmat pigutsivet ilukKisillu amma pigutsilutlutik niket imminik
- ❖ utittitlutik nunalet pigutsivinganik,amma suliatSaKalâmatta inunnit tapsumunga suliatSamik
- ❖ ilinniatlutik

âKkisiutlutik nunaminik pigutsaminik amma ommajutsaminik
❖ pigupputlutik unuttunik nikitsaminik

nujuattait nikitsangit piguttuit

- ❖ takunâtlutik aullâvitsangit/illugusuit/ilukKusingit satjugianni: sunait pigusimajut tamâni? sunait sulli pigujuit tamâni? suli tapkua omajugaluit piguttausot tamâni?
- ❖ ippiniagusittausot niketsait imaKâ nujuattait omajuit piguttut
- ❖ suliatSaKatluni piguttunik pigujunik nunalinni suliatSaKalet

ammalugiat tumingit

- Makkovimmogialagumavunga Augustami/ Siptimpamilonet 2012 takunnâgiattutlunga piguttunik omajunik ujanniavinni. UKâlautiKavunga Errol Andersenimik amma Jamie Brake(Nunatsiavut Gavamanga ujanniatik) tapkuninga ujuganniavitsanganik.
- IpikKosiatsâlâKunga takutitsitlunga tapkuninga naffâsimajakka niukKusimaliguma Makkovimut.
- KaikKujivunga uKâlautisongulâgatta naffâsimajaganik sivullipânik Kinijatsaganik.
- suliatSatâgiallagumavunga nunalinni âKkisiugiallaltlunga naffâsimajaganik, takutitsimajaganik tapsuminga Kinijatsaganik tamâni. ketali imminik suliatSalet takutitsigunnangituk ilonnanganik naffâsimajagnanik, immâKa pijagesimajakka atuttausongujut aipanganut ikajutluni Kinijatsait Makkovimi.

Nakummek ilonnasi ilitannamesimagatsi uvannik Makkovimut.
PikKosiatsiavunga Carol Gearimut ikajulaummat âKkisiutluni niukKuvitsaganik, Errol Andersenimut ikajulaumat atutluta motaminik amma takutitluni nunamik,amma Janine Lightfootimut katimagelaugatta uKâlautitluta Kinigatsanik Makkovimmi. PikKuosiatsiavunga aujani sugusinnut Charlene Ford amm Jeannie Ikkusek ikajulaumatta uvannik ilitannaligatta inunnik nunalinni. kingulipâmik nakummesuavunga takunniga uKâlautiKalattut uvannut inunnut amma piguttunillu - nakummek! pikKosiavunga Kinijatsaganik suliatSanganik:

SSHRC CRSH

Carleton UNIVERSITY

apitsotet? UKâlautigut? pivalliasait?

allatausok Erica Oberndorfer- kagitaujakkut: (personal info removed)

website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Appendix C Research update newsletter 2 – English

The shared stories of people and plants

A preliminary look at the plants of archaeological sites

Makkovik and area visit: Sept 4–7, 2012 – Trip Report Erica Oberndorfer, PhD student (Carleton University)

Purpose of the trip

- The purpose of this trip was to look at plants of archaeological sites in the Makkovik area, and observe vegetation patterns at these sites. This is one component of a larger project looking at

broader relationships between people and plants.

- Guidance on archaeological site locations was provided by Jamie Brake (Nunatsiavut

Government Archaeologist). All sites were visited with Conservation Officer Errol Andersen and/or Guide Sheldon Andersen. This preliminary work was previously discussed with Carla Pamak, Nunatsiavut Government Research Advisor.

Activities during this trip

- Visited 11 archaeological sites (1 other site visited in July) in the Makkovik area
- At each site, noted vegetation communities
- At four sites, conducted detailed sampling using a 1 x 1 m quadrat (in photo)
- Using this quadrat, recorded all species of plants, lichens and moss,

- both at and adjacent to archaeological sites
- Collected plants where species was unknown, for later identification
- Visited the old Moravian Mission site and other shoreline sites to look for garden species that are still locally harvested
- Met with Janine Lightfoot and Carol Gear to provide an update on my research activities and to follow-up on my previous report

Next steps

- I will analyse the information collected during these site visits to look for patterns between archaeological sites and plants. All results will be shared with the Makkovik Inuit Community Government as soon as they are available.
- I will begin to develop a formal proposal for further research in Makkovik, for your review.
- I hope to visit again in winter 2013 to continue developing a multi-year project in Makkovik.

I am grateful to Errol Andersen, Sheldon Andersen and Jamie Brake, whose knowledge, skill and time made this work possible. I also thank Janine Lightfoot and Carol Gear for helpful feedback and ideas on this work. Nakummek!

I gratefully acknowledge my research support:

Trip report completed Sept 17, 2012

Questions? Comments? Suggestions?

Please contact Erica Oberndorfer - email: personal info removed / phone: personal info removed

website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Appendix D Research update newsletter 2 – Inuttitut

unikkausingit Inuit amma piguttungit

takutitsingit piguttungit ujanniavialunni

Makkoviup nunanginit niukKuvingani Sept 4–7 – NiukKuvinga

Erica Oberndorfer, PhD ilinniajuk (Carelton Ilinniavialungani)

NiukKuvinga

- NiukKusimalauttur takunâgiatlunillu piguttunig ujaganniavialuni Makkovimut Nunagani, amma takunâtlunillu pigusongujunik ujaganniavialuni. tapkua atautsiutuinaujut angijualunnik suliaatsaminik

takunâtluni Inunnit amma piguttunik.

- maligatsangit ujaganniavialuni nunangit ikajuttaulauttur Jamie Brake (Nunatsiavut Gavamanga ujanniavialuit suliatik). Ilonnatik ujaganniavet

niukKuttaulauttur ilautlutik Errol Andersen piulimajaugialinik kamajigialik amma/uffau aKumigottik Sheldon Andersen. Tanna suliaatsangit UKâlauttiKalauttut Carla PamakOnut, Nunatsiavut Gavamanga Kinijattik SuliatsaKattajumik.

sulaummângat niukKusimangani

- niukKusimalauttur 11 anit ujaganniavialunit (1 aipanga ujaganniavik July–mi) Makkovik saniani
- ujannganiavinni, takulauttur piguttugalanik nunaliganni
- sitamanit ujaganniavini, allalauttur naffâsimajanik atuttlutik 1x1m ottotimik (atjinguami)
- ottotimik atuttlutik, allagiallauttur ilonnanik piguttunik naffâsimajanik, niKânik, tapamaptik amma sanianingani ujaganniavialuni.

- tigusitlutik piguttunik tamâni piguttut pigugunnagiasisimajunik ,atuttausongulâmma siagugiak
- niukKuutlutik nutângitumik Moravip Missioningani amma aipanganik sitjait Kinigatlutik pigutsevinik piguttungit atuttaugialasongujunik uffallu nigijausingujunik
- katimatlunillu Janine Lightfoot amma Carol Gear takutitsitluni naffâsimajanginit amma maligiallilitluni allavitsangit suliaatsaminillu.

Tuimgiallangit

- maligiallâlâttuk naffâsimajanginik niukKuisimaliguni Kinijatlunillu aipagiallanik ujaganniavialuni piguttunik. Ilonnatik takutittaulâttut Makkovimi Inuit Nunaliganni Gavamanganut pijagettauppat suliaatsaminik.
- Kinigiallagumajuk asianik allâlâttuk ikajuttaugumagami Kinigiallagatsanik Makkovimi, takutitsilâttuk ilonnainut sulitsangit.
- NiukKugiallagumajuk Ukiumi 2013 pivalligumagami suliaatsaminik imakâ jârigiallanik Makkovimi.

PikKusiasiajukKok Errol Andersen, Sheldon Andersen amma Jamie Brake, kiapKok isumatsiaKajuk, Kaujimagami amma ikajusimalaugami suliaatsaganik. Nakummesuavunga Janine lightfoot amma Carol Gear ikajulaumatta UKâlautiligatta amma isumajâlaugatta suliaatsaganik. Nakummek!

pikKusiasiaavunga Kinigajatsakka suliaatsaganillu:

Carleton
UNIVERSITY

WILDLIFE
PLANTS &
FISHERIES

SSHRC CRSH

NiukKuvinga pijagettuk Sept 17, 2012

apitsotet? UKâlautigut? pivalliasait?

allatausok Erica Oberndorfer– kagitaujakkut: personal info removed

website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Appendix E Research update newsletter 3 – English

The shared stories of people and plants

Reporting back from 2012... and research ideas for 2013

Makkovik visit: Feb 18–22, 2013 – Trip Report Erica Oberndorfer, PhD student (Carleton University)

Purpose of the trip

- The purpose of this trip was to share what I learned in 2012 about community priorities for research on the topic of people–plant relationships in Makkovik.

- In addition, I wanted to share some ideas for future projects on the topic of people–plant relationships in Makkovik, and hear feedback on these research ideas.

- The trip gave me an opportunity to visit with plant experts, and to

continue getting to know people in the community

- This was also a chance to host my first ever game of Plant Bingo!

Activities during this trip

- Presented a slideshow at the Elders' dinner on Wednesday February 20, to share my activities in 2012. I also hosted a Plant Bingo during dinner. Fortunately, I had a lot of people to help me when I made mistakes!

B I N G O

Aster	Fireweed	Arctic rattlebox	Delphinium	Boil-up
Seaside plantain	Sandwort	Seaside ragwort	Cleaning redberries	In the willows
Labrador tea	Silverweed	FREE
Willow buds	Blue mountain heather	Balsam fir seedling	Currants	Goldenrod
Black spruce buds	Iris	Clover	Scotch lovage	Berry-picking

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:

personal info removed

<http://straightupnorth.ca/Sikuliriji/Oberndorfer.html> ~ on Facebook: "Makkovik - People and Plants"

Nakummek! ~ Thank you!

(Activities continued from pg 1)

- Spoke on CIML Radio with Elsie Broomfield about the project, and about my interest in plants. Thank you, Elsie, for guiding me through my first time on the radio.
- Hosted a presentation at the Community Hall

on activities from 2012. Fortunately Sheldon and Eldred came to help polish off the food!

- Spent time at the Makkovik Inuit Community Government offices to learn more about how this research can support community goals and ongoing projects
- Was graciously welcomed into the homes of plant experts in Makkovik, and enjoyed hearing stories about plants and special places for both people and plants

Juniper/larch/tamarack buds

Next steps

- Based on my visits and conversations about research priorities in Makkovik, I am working on a research proposal to formally outline the work I hope to continue over the coming years
- I am getting in touch with plant experts to discuss the next steps of this project
- I hope to be back in Makkovik in July 2013

I would like to thank all the Elders who welcomed me to their dinner. I also thank Linda Pottle and Mary B Andersen for introducing me at the Elders' dinner. Thank you to AngajukKâk Jacque, Terry Rice and everyone at the Makkovik Inuit Community Government for all their time and feedback on this project. Thank you to Elsie Broomfield for including me in her radio broadcast. Thank you to Joan Andersen for sharing her research experience. I thank Sheldon and Eldred Andersen for their help at the community hall. I thank everyone for welcoming me into their homes, and continuing to help me understand the importance of plants. I am very grateful to Carol Gear for her ongoing guidance throughout all stages of this project.
Nakummek!

I gratefully acknowledge my research support:

Trip report completed March 12, 2013

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:

personal info removed

<http://straightupnorth.ca/Sikuliriji/Oberndorfer.html> ~ on Facebook: "Makkovik - People and Plants"

Nakummek! ~ Thank you!

Appendix F Research update newsletter 3 – Inuttitut

Unikkâtausimajut Inuit piguttungillu

unikkausiliutingit 2012, amma sakKititsaminik 2013

Makkovimut niukKusimajamini: Feb 18–22, 2013 – NiukKusimajamini sakKititsajait
Erica Oberndorfer; PHD ilinniajuk (Carelton Ilinniavialungani)

NiukKusimajamini sakKititsasimajuk

- Pinianninga niukKusimajangit sakKititsitluni ilinniasimajamminik 2012 imi nunalinganit sukutigijaujut sakKititsaminik unikkâtausimajunik Inuit–piguttungillu ilagengit Makkovimi.
- Aipagiallangit, ilangappâgumajuk sakKititsanik sivulliatitsanganik suliaKapvitsaminik Inuit–Piuttungillu Ilagettungit Makkovimi, amma allasimajamminik tapkuninga
- NiukKusimagami ikajutitaulauttuk takugiatlutiluni piguttunik Kaujimajunik, amma pigalliatluni Inunnik nunaligimi.
- Tapkua tujummiuvilauttut sivullipângit pinguatluta Pinkunik!

aviKatigeluni pinnianinganik 2012–imi. Piguttunik pinkunguanik sakKititsilauttut nigigiatuumaaliganik. Ikajuttautluni inunit tammaliganik pinguatgatsaminik!

B I N G O

pinnianigit niukKuligami

- takutitsilauttuk atjiliusimajamminik inosittunut Mitwchimi Februart 20,

PikKujaliaKagutsi, uKautitsaKagutsi, upvalu apitsotitsaKagutsi, Kaujitsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

- uKâlalauttuk nâlautikkut Elsie Broomfiled timut sunanik sakKititsigumagunik, amma kamagigumajamminik piguttunik. Nakumek Elsie ikajulaugavit uvannik sivulippâaummat nâlautikkut.

- sakKititsilauttuk suliataminik Hallimi

pinianiganik
2012 imi.
Sheldon
amma Eldred
ikajulauttuk
uvannik
nigigiattutluta
niKitsaniknik
• Makkovik
Inuit

Gavamanganilauttuk suliatavimi
ilinniagiattutluni Kanuk sakKititsajaminik
ikajuttausot nunaligingani tugâgutingit
amma sivulianingit ilinniagatsangit.

- Kujannametluni ilâli inuit angigganganut
Kaujimajunik piguttunik Makkovimi, amma
Kuviasuttluni unikkâjunik piguttunik amma
aullâvitsaminik tapkua tamammik inuit amma
piguttuit.

aipagiallangit

- takusimajanik niukkusimaligami uKâlaligami
tapkuninga sakKititausimajut Makkovimi,
suliaKavunga sakKititsanik

PikKujaliaKagutsi, uKautitsaKagutsi, upvalu apitsotsaKagutsi, Kaujitsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

takutitaugiaKajunik
suliatsait
sivulliagumavunga
Kaijunik jârinik
tikijunik.

- UKâlagiattuvunga
tapkuninganut
Kaujimajut
piguttunik
uKâlagiatutlunga
Kanuk

sakKititsigiallasongumangâma suliataganik.
Makkovimigumavunga Juliami 2013.
Nakummegumavunga ilonnainut
inosittuKanut Kujannalaumatta uvannik
nigigiattutlunga.

*Nakummek Linda Pottle amma Mary B
Andersenimut Kaujimatitsilaummat
InosituKainik Kitigalitsiutiligatta.*

*Nakummek AngajukKâk Jacque, Terry Rice
amma ilonnainut Makkovik Inuit Nunaligimi
Gavamangani sitontinganit amma
Kaujitsilaumatta suliataganik.*

*Nakummek Elsie Broomfiled KaKujilaummat
nâlautiviffimut Kaujimatitsitluni nâlautikkut
Nakummek Joan Andersen aviKatigelaumat
suliatsanganik Kaujimatitsiagami. Nakummek
Sheldon amma Eldred Andersen ikajulaummat
Hâllimi. Nakummevunga ilonnainut
KaikKujilaumatt illuminut, amma pivalliatlutik
ikajutlutik uvannik tukisianattunik
suKutigijaujunik piguttunik. NakutlaKutit
Carol Gear ikajulaummat unuttualunik
ilonnangani suliataganik. Nakkumek!*

Sigimavunga ilitatsilaumatta suliatasa ikajulauttunik.

niukKusimajaminik pijagettaulauttuk March 12, 2013.

The shared stories of people and plants

Summer 2013 review of activities

Makkovik visit: July, August, September 2013 – Trip Report

Erica Oberndorfer, PhD student (Carleton University)

Purpose of the trip:

When I asked Makkovimiut about their priorities for research on the topic of people and plants in 2012/13, many people described a need to start documenting local knowledge about plants. This summer, I began speaking with people about their relationships with plants, and learning about the many ways that plants are important in daily life, as well as in years past. Some of the topics people have shared include:

- ❖ Plants as food (springtime wild plants, garden plants, berries), medicine, materials (blackberry sod, plant dyes, grass sewing)
- ❖ The importance of families spending time together on the land
- ❖ Stories about plants from childhood
- ❖ Places that are important to people for plants

I have been asking for permission to record some of these discussions on a mini audio-recording device. When people prefer not to be recorded, I take handwritten notes to remember the stories they share. The idea is to create a record of people talking about plants in their own voice, and to make these stories and this knowledge available for future generations. Audio files and transcripts will be stored in the White Elephant Museum, and may be used for future teaching and community projects. As this project is part of my graduate studies, I will also be writing and talking about this project to people outside Makkovik.

My goal over the next several years is to speak with people about plants, in discussions in town and on-the-land. I am also looking at the plants of family places in the bights and islands around Makkovik, to see if plant

communities can tell their own stories about people and about past practices on the land. Everything learned during this project will help in the development of a guide book on plants in Makkovik, and in the development of other community projects that tell the shared stories of people and plants.

Trip activities:

This past summer, I was in Makkovik in July (15–21), August (12–26) and September (10–20). During this time I was very fortunate

to be welcomed into people's homes to talk about plants. I'm grateful for everyone who took the time to speak with me in their homes, outdoors, and at their family cabins. I also appreciate the effort people made to teach me about

plants hands-on, including how to:

- ❖ Make a smoke pot
- ❖ Make spruce beer
- ❖ Pick berries
- ❖ Collect plants for natural dyes
- ❖ Pick saltwater grass for grass work
- ❖ Use berries for paints
- ❖ Garden, compost and make fertiliser

Along with Guide Sheldon Andersen and Conservation Officer Errol Andersen, I also had the chance to visit many of the amazing family sites around Makkovik, to look at the plants of family cabins, former gardens, fishery outposts, and older archaeological sites. Some of the places we visited include Ikey's Point, Strawberry Harbour, Makkovik Bay, Dunn's Island, Turnaviks, Seal Cove, Big Bight, October

Harbour, and Noon Walk Island. In September, people in town were very kind to share parts of their rhubarb plants with me as part of a pilot project looking

at whether different rhubarb patches can be genetically traced to areas along the coast, and whether the distribution of rhubarb mirrors the movement of families on the land. I hope to have

preliminary results back in a couple of months.

Other activities:

I was very glad to participate in community activities and get to know people throughout the summer. During the Trout Festival, I helped organise a painting with berries activity for

kids, and gave a presentation on plants at the Craft Centre. I'm proud to have participated in the swim race, and just glad to have finished (even though it was in last place ☺).

I was on the radio to talk about this ongoing project on people-plant relationships, and I helped prepare a workshop at the Craft Centre on making natural fabric dyes from plants. I

was happy to once again join the Elders' dinner and give a slideshow on plants.

Next steps:

I will be in Makkovik in late fall and winter to continue speaking with people about plants. As the seasons change from berry-picking to snowshoeing, I hope to learn more about trees and how people work with wood. I look forward to presenting an update to the Makkovik Inuit Community Government, and to continue discussions on how this project can contribute to tourism projects underway in Makkovik. There is a lot of interest in continuing the plant workshops at the Craft Centre, so we will be planning future workshops, including one on grass sewing.

If you would like to discuss the importance of plants in your life and share your experiences with this ongoing project, I would be happy to speak with you when I am next in Makkovik. Please let Carol Gear know you would like to speak with me, or please contact me by email or phone.

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:
personal info removed

On Facebook: "Makkovik - People and Plants" ~ University page: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakmmek! ~ Thank you!

Thank you

I am grateful to the many people who have shared so many of their stories and experiences with me. I am grateful for all the hours we spend together. For their hospitality and kindness (and rhubarb leaves!), I would like to thank Annie Evans, Nellie Winters, Ellen and Harold Andersen, Enid and Charlie McNeill, Jim McNeill, Joan Andersen, Lori Dyson and Randy Edmunds, Andrea Hoyt and Frank Andersen, Mary B and Tony Andersen, Albert Andersen, Margie Broomfield, Mary Ann Andersen and Eldred Pottle, Marilyn Faulkner, Megan Andersen, Holly Andersen, Gladys and Henry Jacque, Chantelle Andersen, Hank Andersen, and Denise Lane and Alden Jacque.

Thank you to the Elders and the team at DHSD for their welcome and for inviting me to once again join the Elders' dinner. Thank you to Sheldon Andersen and Errol Andersen for their guiding expertise and for putting up with my lack of sea-legs. I thank AngajukKâk Jacque, Terry Rice and everyone at the Makkovik Inuit Community Government for their enthusiasm and support for this project. My thanks to the wonderful group of people who participated in the Craft Centre berry painting and plant dye workshop. I would especially like to acknowledge the ongoing efforts of Carol Gear, who continues to provide invaluable guidance and support for this project.

I gratefully acknowledge my research support:

SSHRC CRSH

Trip report completed October 9, 2013

Appendix H Research update newsletter 4 – Inuttitut

unikkausingit Inuit amma piguttungit

kiugusijuk kingullipânganit 2013

Makkoviup nunanginit niukKuviani Julimi, Augustami, Siptimparami 2013 – NiukKuvinga
Erica Oberndorfer, PhD ilinniajuk (Carelton Ilinniavialungani)

summakiak niukKujut:

Apigilaugama Makkovimiunik Kinigatsanik piguttunganik 2012/13 –ami, unuttuit Inuit Kanumangât Kinigatsait pijaulâmangât piguttungit UKalauttut. Aujami, UKâlautiKalaukKunga Inunnut ilagettugejunik piguttunik, amma ilinniatlunga unuttunik piguttunik ilusinganillu piguttunut

suKutigijaujuit ullu–tamât inosittinik, amma jârini taipsumanganik. Ilangit UKâlautiKatigelauttut allataujut:

- ❖ Piguttuit niKitsait (Upingâmi nujattait piguttuit, pigutsivet piguttuit, paungat), ejatsait, piKutinigt (paungait piguttuit tauttungit, ivitsuKait mitsugatsait)
- ❖ suKutigijaujut ilaget aullâvitsanganit nunagalamini
- ❖ Unikkauset piguttunik sugusiulitlutik
- ❖ Nunagalait suKujigaujut Inunnut piguttunginut

ApitsugalalaukKunga angipputausongumangât nipiliujasongumangât uKâlautinganik nipiliuguntimik. Inuit aukâgunik nipiliugutimik atusongumangâma, allaKattatlunga ikKaumalâgama unikkausinganik aviKatigejunik. Sulijaugumagatta nipiliusingulâgatta Inuit uKâlautiKajunik piguttunik nipinganik imminik, amma sanatlutik unikkausinginit amma

Kaujimajaminik takujausongulâmatta sivunitsaminik. nipiliugutingit allatausimajangillu piulijausimalâttut taunani Illugusimi White Elephantimi piuligatsami, amma atuttautlutik ilinniatitlutik sivunitsami Nunaligettinik suliatsalimi. SuliatsaKait ikajujuk uvannik ilinniavialugani, allagialâkKunga amma uKâlautiKatlunga tapsominga suliatsanik Inunnut silatân Makkovimillu.

tugâgutiga jârinit tikijunik uKâlautigumajaga Inunnut piguttunik, uKâlautigatsait nunalinni amma nunaKatigeni. Kinigalagavunga piguttunik ilagettunillu nunaganik. Ilonnagit ilinniajaujut suliatsangit ikajulâttut âkKisiujaujunik

Kimmigguagatsaminik piguttunut Makkovimi, amma suliaKattauput aipanganik nunaligijini suliaKatsaminik uKauttigit unikkausanganik Inunnut amma piguttunganik.

niukKujut sulijungit:

Aujami, MakkovimmolaukKunga Julimi (15–21), Augustami (12–26) amma Siptimparami (10–20). Taipsumani sitontingani nakunnatuinnaKuk Kujannamejaugiamik Inunnut illunganut uKâlautiKatluta piguttunganik. PikKosiavunga ilonnainut taikuninga sitontiminik uKâlalaumatta uvannu illumini, silam, amma aullâvitsanganit. nakutlaKangallu Inunnut ilinniatsilaugamit uvannik piguttunik tamâni,

ammalugiat Kanuk pigiamik ukuninga:

- ❖ sanagiamik isigatsamik
- ❖ sanagiamik piakulunik napâttutininik
- ❖ paingasiugiak
- ❖ pikatatlunga piguttunik
- ❖ pikatatlunga tauttutâgutinuk
- ❖ pikatatlunga imappiuniuo ivitsuKanik

sanagatsanik

- ❖ atutlunga paungait mingugatsait
- ❖ pigusik, sujusimajunik, amma sanatlunga pigugaugutinik

AipatiKatigeKatlunga Sheldon Andersen amma piulimajaugialinik kamaliliagik Errol Andersen, takugiattulaugivunga unuttunik

piujualunik ilagejunik tugautinik Makkovimi, takunnâgiatlunga piguttunik ilaget aullâvitsanganik, pigusivet,

oganniavet, amma aippanganik ujanniavet tugaujunik. Ilangit takugiattulauttavut allatausimajut: Ikey's Point, Strawberry Harbour, Makkovik Bay, Dunn's Island, Turnaviks, Seal Cove, Big Bight, October Harbour, and Noon Walk Island. Siptimparami, Inuit nunaligani inungunnitulauttut ningiagiamik sennâlunik piguttunik uvannut suliatSaKalâgama takunnâtluta sennâluit KimmiggutausongugajakKat pigutsasimamangâtta avatattini ilagettini nunaligijini. utakKivunga naffâttausimajunik imaKâ tusalâkKunga maggogalanik takKinik.

Aipangit sulijut:

PikKosialaukKunga tamenelaugama nunaligijini sulijunik amma ilitannagiamik aujakkut. IKalut ullusiuvingani, ikajulaukKunga mingagatsanik paunganik sugusikulunut, amma uKâlaukKunga

piguttunik sananguagiattuvimmi. pikKolaukKunga salaKanguagiattulaugama piutjunguagiatutlunga, amma pikKotuinalaukKunga pijagegiamik salaKanguvitsanik (ketali Kimattaulaugama

kingulipâmik tikitlungallu :) Nâlautikkut uKâlaukKunga sulitsaganik Inunnut-piguttunut ilagetunnik, amma ikajutlungalu sananguagiattuvinni sanaguatluta tauttutâgutini piguttunik. KuviasulaukKunga ammalugiak kativâlaugama InutuKait nigigiattuvingani amma takutitlunga takKatotini piguttunik.

sivunitsak:

MakkovimmelâkKunga ukiutsâmi uffalu ukiami pivalliatlunga uKâlaKatigetlunga Inunnut piguttunik. Silatsuavut tausipâmatta paungasiugialugutta tallonguligitta, ilinniagumavunga napâttunik amma Kanuk Inuit suliaKa just Kijunnik. UtakKigunnangilanga takutitsiganik Makkivok Inuit Nunaligijinut Gavamanganut, amma pivalliatlungalu uKâlautitsaganik Kanuk tâna sulitsak ikajusongumangât niukKujunut sulitsangit mânna Makovimi. UnuttuKavut pigumajunik suvulliagumajut piguttuit sulitsaminik sananaguavimi, taimamat âkKisiugiallavugut sivunitsanik sulitsanik ilagetlutik sanaguagiamik ivitsuKanik mitsugianik.

UKâlautigumagutsi tapsominga piguttunik inosinik amma aviKatigumagutsi unikkausini tapsumunga, KuviasutsianiakKunga UKâlautigegumagutsi Makkovimmeliguma. aliakkapâonguvusi Carol Gear UKautigajattait UKâlagumavutit uvannut, aliakkapânga Kagitaujakkut uffalu phonikkut.

apitsotet? UKâlautigut? pivalliasait?

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikiliriji/Oberndorfer.html>

Nakkumek! ~ Thank you!

Nakkumek

sigimavunga ilonnatinut Inunnut avitasimajunik unikkausimminik amma Kaujimajualumminik uvannut. PiKosiavunga ilonnanik sitontinik ilagettluta. tujummiuvigijannitungit amma inuugunittungillu(amma sennâlunik nakaujanik!), Nakummegumavunga ukuniganik:

Annie Evans, Nellie Winters, Ellen and Harold Andersen, Enid and Charlie McNeill, Jim McNeill, Joan Andersen, Lori Dyson and Randy Edmunds, Andrea Hoyt and Frank Andersen, Mary B and Tony Andersen, Albert Andersen, Margie Broomfield, Mary Ann Andersen and Eldred Pottle, Marilyn Faulkner, Megan Andersen, Holly Andersen, Gladys and Henry Jacque, Chantelle Andersen, Hank Andersen, and Denise Lane and Alden Jacque.

Nakkumek InosutuKait amma suliaKatingit DHSD ni Kujannamelaumatta uvannik KaikKujilaugamit InosutuKait Nigigiattuviganut.

Sheldon Andersen amma Errol Andersen ikajulaumatta kamajiliagilaumatta amma tutsitomangilaumatta uvannik niukulugallu pisutsilaugunnamanga.

Nakummek Angajukkâk Jacque, Terry Rice ilonnainut Makkovik Inuit Nunaligenik Gavamanga piujutsialaumatta amma ikajutsialaumatta suliaatsaganik.

NakutlaKusi Inunutsianut Inuit ikajulauttut sanaguagiattuvimi paunganik mingugatsanginit amma piguttuit tauttutâgutiminik suliaatsanganik. Kaujimagatsavunga suliaatsangit piujulunnik piKattamat Carol Gear, ikajutsiaKattamat kamajiligiKattamat tapsomunga suliaatsaminut suliaatsait.

Nakummek! Takulâvagitsi.

Nakummesuavunga ilonnainik ikajugatsi tapsominga:

NiukKuvunga pijagettuk October 9, 2013

Appendix I Research update newsletter 5 – English

The shared stories of people and plants

Winter 2014 Update

Visits to Makkovik: February 3–9 2014, March 14–28 2014

Erica Oberndorfer, PhD student (Carleton University)

Purpose of the visits:

While most of the plants in Makkovik are sleeping beneath the snows, winter is a great time to learn about the importance of trees. During three weeks this winter, I spoke with people about the importance of trees in Makkovik, and about how people harvest and work with wood.

Activities:

On these winter visits, I especially spent time learning about snowshoes, carving, and wooding. I learned about some of the ways artists and craftspeople select trees for their work, prepare their wood for working, and about the qualities that make different trees suitable for different purposes. Thanks to guide Sheldon Andersen, I was able to get outside and learn about wooding around Makkovik, as

well as some other ways that trees are important: trail markers, birch bark, kutsuk/ spruce gum... and digging yourself out of the slob! :) During these winter visits, I also began returning audio CDs and printed transcripts of conversations from discussions about plants in summer/fall 2013.

Reviewing these transcripts in person allows us to correct any mistakes, add more information, or discuss any edits people wish to make. Eventually, it's the stories within these transcripts that will inform a plant guide for Makkovik.

Other activities:

I once again enjoyed a chance to join the

Elders' dinner at DHSD, and to share a slideshow on areas around Makkovik I've been visiting. Still no luck at bingo, though! I also presented a slideshow on an upcoming conference I am traveling to in Bhutan from June 1-7. At the close of

this conference, there will be a Festival with music, food, and craftwork from Bhutan, as well as from other countries. Thanks to the support and advice of Chantelle Andersen, Mary B Andersen, and the women of the Sewing Circle, we will be proud to show the sewing and craftwork of Makkovik at this festival. Seventeen people contributed items for the conference, ranging from sealskin mitts to beadwork

to an amautik. There are pictures of this work on the Facebook page "Makkovik – People and Plants." Thank you to

MARY B ANDERSEN

For the International Society of Ethnobiology Congress in Bhutan, Mary B has done several different works. The flower beadwork with seal skin is seen on shirt with above. She has also made two pairs of slippers from moosehide and rabbit fur, with beading on the top, and pile lining. The rug looking designs of partridge and seal are made with fur and wool on a frame. In designs drawn by her husband Tony Andersen.

everyone for working with me to develop your craft biographies, which have been printed and shipped with your work so that people in Bhutan can learn a bit more about each of you. I had a fantastic time at Jamboree, and am grateful to Henry Jacque for accompanying me on guitar, and also to Kim Andersen for encouraging me to sing.

Next steps: I will be back in Makkovik in late June, once I return from the conference. I'm looking forward to speaking with people about spring and early summer plants. Based on what I've learned over the past year, I'm now

planning the part of the project that looks at the plants of family cabins, which I'll be continuing this summer and fall. I'll be excited

to host a slideshow at the Community Hall to report back on the journey of your sewing and craftwork to Bhutan. Until then, I hope everyone has a wonderful spring season.

~ Mrs Nellie Winters

~ Mrs Clara Ford

~ Mrs Margie Broomfield

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:
personal info removed

On Facebook: "Makkovik - People and Plants" ~ University page: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakumnek! ~ Thank you!

Thank you

Thank you to my guide Sheldon Andersen for sharing his time and experience with me. Thank you to all the talented craftspeople who contributed work to the Festival in Bhutan: Annie Evans, Blanche Winters, Carol Gear, Chantelle Andersen, Clara Ford, Elsie Broomfield, Elsie Evans-Green, Enid McNeill, Frances Clark, Hilda Evans, Margie Broomfield, Mary B Andersen, Nellie Winters, Roxanne Nochasak, Ruth Flowers, and Tony Andersen. Thank you to the team at DHSD and all the other organisers of the Jamboree.

Visit report completed April 15, 2014

I gratefully acknowledge my research support:

UnikkâKatigesimajut Inuit amma Piguttulittâtlutik

Ukiumi 2014 Kaujisautet

Makkoviup Nunalinga niukKuviani : Feb 3-9/March 14-28, 2014 – NiukKuvinga allasimavinga
Erica Oberndorfer, PhD ilinniajuk (Carleton Ilinniavitsuak)

Summat Niuggulauttuk:

Ilangit piguttuit Makkovimmi Kuasimanninginni aputimi, ukiuk piujutsiak Kaujisagiamik ikKananningit napâttuit. Pingasunik vogini ukiungulauttumi uKâlaKatiKalaukKunga ikKanallagininginnik napâttuit inunnik Makkovimiunut, amma Kanuk Inuit atuKattamangâta Kijunik.

Pikatalauttavut:

Niuggugama ukiumi, KaujisalaukKunga talluliugiamik, sananguagiamik, amma Kijuttagiamik. KaujisalaukKunga Kanuk ilangit sananguatet KinijaKattamangâta napâttunik atugatsaminik sanangualigamik, atuinngutjigiamik Kijunnik atugatsanik, amma Kanuk piunippât Kijut atuttausongumangâta sunatuinnanut. Nakummejaga Sheldon Andersen Kaujisattilaummânga, KaujimalikKunga Kanuk Kijuttagiamik

Makkovimi, ammalugiallak Kanuk napâttuit ikKanammangâta: Maligatsait akKutinni, Kaigulik, kutsuk/napâttutuinnait... amma mausimatluta Kausitlatumi nogasuagiamik. :) Niuggugaigama ukiumi taitsumani, utittisiliaKilaukKunga nipiliuttausimajunik (CD)

amma allatausimajunik unikkausunik uKâlaKatigilauttakanik piguttulittâtluta aujami/ukiatsâmi 2013-mi. Kimiggunitinni âkKisugiattausot tammasimagutta, ilagiallugit Kaujisautinik, âkKigiallugillonet.

Kangakkiak, takkua unikkauset allatausimajut
ikajulâttut sakKititsiligutta atuttausongulâttuk
piguttunik Kaujisagumajunik Makkovimmi.

Asigiallait Kaujigatsat:

Aliagitlalaugivaga InutuKannut
nigigiattuKataulaugami DHSD-kunut,
takunnâgunnatilaugakkit atjinguannik
Makkovimmi aivigisimajakkanik. BINGO-
nguatlunga keta sâlaKalaungitunga!
Takunnâitsigunalaummijunga
katimavigigiattulâttaganut Bhutan-imut Juni
1-7-imut. Pijagegutik
katimanniminik, ullusiuvingani tutsiagalâttut,

amma takutitsilâttuk
sananguataumajunik
Bhutanimiunut,
ammalugiak asinginnit
nunalinnit.
Nakummejuk Chantelle
Andersen, Mary B.
Andersen amma asingit
annait mitsuKattajut
Makkovimi,
pijugitlalâttuk
takutitsigiamik
mitsutausimajunik

amma
sananguatausimajunik
Makkovimi
taitsumani
ullusiuvingani. 17-nat
sananguasimajaminik
tunitjilauttutt
katimagiattulunga
atjagatsakanik,
atjigengitugalannik
Kisijanik pualunik,
sapanganik
atusimajuillu, amautimillu. Takujausot atjinguat
Kagitaujakkut taijaujumik: "Makkovik-People
and Plants. Nakummek ilonnasi
suliaKaKatigilaugatsinga âkKisiutlusi

MARY B. ANDERSEN

sananguasimajatsinik atuinnaugutjitlusi
âkKitausimalittut amma aullatitausimalittut
takujaulâmatta Bhutanimiunut,
Kaujisagalâlusilu ilitsinik.
KuviasutsualaukKunga Jamboreemi,
nakugitlataga Henry Jacque
ikajulaummânga Killulagatilugu, amma Kim
Andersen pikKujitsialaummânga tutsiagiamut.

Sulâgivinga:

Utilâmmijunga Makkovimimut Junimi nânigalak,
katimagesimaligutta. NigiutlaKunga
uKâlaKatiKagiamik inunnik upingâmi aujamilu
piguttulittâgiamik. Kaujisasimajakka
isumagillugit jâriulauttumi,
atuinnagutjigumajunga piguttunik
aullâvitsinettunik, pivalliagumajakkanik aujami
amma ukiatsâmi. TakunnâitsilâkKunga hâllimi
Kaujitillusi Kanuk pilaummangâmma
mitsusimajasinik Bhutanimi.
TaitsumaukKâtinnagu, ilonnasitok
KuviasuniakKusi upingâmi.

~ Nellie Winters

~ Clara Ford

~ Margie Broomfield

Pkkujaliakagutsi, uKautitsaKagutsi, upvalu apitsotitsaKagutsi, Kaujititsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Nakummek

Nakummevunga Sheldon Andersen–imut
ikajulaummânga. Nakummek ilonnasi
sanangualuttusi Kaitsitlusi
takujautitsisongulaugama Bhutanimi:

Annie Evans, Blanche Winters, Carol Gear,
Chantelle Andersen, Clara Ford, Elsie
Broomfield, Elsie Evans–Green, Enid McNeill,
Frances Clark, Hilda Evans, Margie Broomfield,
Mary B Andersen, Nellie Winters, Roxanne
Nochasak, Ruth Flowers, Tony Andersen.

Nakummemijakka ilonnatik DHSD–mi suliaKatet
ammatauk ikajulauttut Jamboreemi.

NiukKuvunga pijagettuk 2014/04/15

Nakummesuavunga ilonnainik ikajugatsi tapsominga:

The shared stories of people and plants

Summer 2014 Update

Visits to Makkovik: June 23–29, July 16–29, August 9–24, September 12–17 (2014)

Erica Oberndorfer, PhD student (Carleton University)

Purpose of the visits:

Last summer, I spoke with Makkovimiut about the cultural role of plants in the lives of people. This summer, we are looking at the role of people in the lives of plants. Many memories and stories about plants are connected to family places around Makkovik. We are looking

at the plants of family fishing areas, commercial fishing areas, and tenting areas to see how different activities at these places have helped shape plant communities, and also to better understand how the lives of people and plants are interconnected.

Activities:

Many of our days this summer were spent on the land, taking notes on the different species of plants that grow in different habitats at fishing areas. We also focused on what kinds of

plants are growing at former houses, gardens, sheds, and tent sites. We learned more about these family places by speaking with people in

t o w n ,
and by
reading
through
archives.
T h e
work is
ongoing,
so if you
w o u l d
like to
talk to
us about

some of these places, we would be happy to speak with you: Tom's Cove, Ikey's Point, October Harbour, East and West Turnavik, Ironbounds, Malona Point, Topik Point.

Jessica Winters, Research Assistant:

Jessica Winters has been working as a research assistant with this project for the past three months. She has been involved in every part of the project, from field work, to historical research, to learning from Elders, to creating paintings of plants for a Makkovik plant guide. As you can tell from the summary of projects below, Jessica has also been extremely involved in developing programs for youth in Makkovik

around plants, and in contributing to DHSD events. In addition to her research on plants, Jessica was also responsible for leading Northern Ranger tours for Tourism Nunatsiavut. Her talents and hard work have supported and enhanced the project in many different ways. Thank you, Jessica – it has been a pleasure working with you. Best wishes for a great year at university!

Jessica's research summary:

"My summer working for Erica was nothing short of incredible, and I definitely learned more than I would sitting down in a classroom. Being able to go off on the land studying old fishing sites was an amazing opportunity. Besides being allowed to spend my whole day outside, I got to learn some very interesting things about plants, the land, animals and more from Erica. I got to talk to elders, who so kindly shared with me their traditional uses for plants. I got to do field work with a botanist and research other careers, which gave me more insight to what I want to do career-wise. I got to develop programs for youth in Makkovik, teaching them what I learned about plants and how to incorporate the environment with art. Having 10+ hours of field work in one day has definitely prepared me for the type of career I'd like to be in, wildlife biology. The weather and temperatures we faced while doing field work has made me better at things like safety preparation and survival skills. I am so lucky to have experienced this job, I learned so many things that are beneficial to life in Labrador, and I got to do real field work which I'm hoping will be a major part of my job some day."

Other projects this summer:

In July, we had the international grand premiere of "Amos' Amazing Travelling Adventure", a

Amos' Amazing Travelling Adventure:
From Makkovik to Bhutan in slides and film

Thursday July 17
7:00 pm, Community Hall

Please join us to hear more about Amos' journey
Musical introduction by Kendra Jacque
Refreshments and door prize

short film about the journey of Amos the doll (made by Margie Broomfield) from Makkovik to Bhutan (near Tibet). Kendra Jacque opened the evening at the Community Hall with a beautiful violin performance, and everyone enjoyed

Blanche Winters' fine catering while watching a slide show about Makkovimiut craftwork and sewing as it travelled to Bhutan. This artwork

was featured at the Bio-Cultural Festival at the 14th Congress of the International Society of Ethnobiology, from June 1-7, where each item was raffled in support of conservation projects. I presented certificates of thanks to everyone who contributed work for the Bio-Cultural Festival, which included photos of the lucky winners in Bhutan. We then settled in with our

popcorn to watch the film, which can now be viewed online through the project Facebook page: Makkovik - People and Plants.

FROM MAKKOVIK TO BHUTAN

Craftwork and Sewing from Makkovik at the 14th Congress of the International Society of Ethnobiology, June 1-7, 2014 - Bumthang, Bhutan

Presented in appreciation to Mrs Mary B Andersen, in recognition of
your contribution to this international conference
Thank you - Nakkumek - Kadrin chhe

Jessica developed and hosted a weekly craft night for youth throughout the summer, where kids created artwork with plants and other things that they found outdoors. It was a

popular activity and there was always a good crowd at the Craft Centre on Tuesday nights! The craft group worked together to create a kids' guide to plants

in Makkovik. Jessica helped the young artists identify and collect plants on a walk outside, and Mrs Annie Evans taught the group about

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:
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On Facebook: "Makkovik - People and Plants" ~ University page: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

the plants back at the Craft Centre. Thank you to Aunt Annie for sharing her time and knowledge with the group, to Jessica for the idea and for putting the book together, and to all the craft night group for their great artwork. If anyone would like a copy, please let us know.

Jessica designed a fantastic plant scavenger hunt for Trout Fest. It was a great challenge for the teams, starting with puzzles to put together and decipher, and then a race around town to

find and photograph plants. Congrats to all the teams on their success! We also had a fun time learning to build aquariums at another of Jessica's activities for Trout Fest, with 25 kids at the Community Hall – thank you to Tobey C for helping out. Jessica researched and designed posters about plant foods and medicines for the DHSD Diabetes Dinner, and prepared another poster and

plant teas for Culture Supper. I'd like to thank the Elders and team at DHSD for once again welcoming me to their dinners, where I presented a slideshow and continued my losing streak at bingo.

In 2012, people allowed me to collect small pieces of their rhubarb leaves to see if we could learn more about how different rhubarb patches in and around Makkovik may be genetically related to each other. The leaves are still at the laboratory for

testing, so please stay tuned for more news on this, hopefully by spring.

Next steps:

I will be in Makkovik in fall 2014 to listen to suggestions on developing a guide to plants of Makkovik. During each visit, I continue to

return printed transcripts of previous conversations about plants, to make sure all information is accurate, and to discuss how people would like their knowledge about plants to be shared with others.

Thank you

I would like to thank Carol Gear for her ongoing guidance and support of this work, and for all the time she dedicates to this project. I would also like to thank guides Sheldon Andersen and

Todd Broomfield for being so generous in sharing their time and experience with us. A great many people in Makkovik continue to support and contribute to this project – without all of you, this work would not be possible.

Visit report completed Oct 2, 2014

I gratefully acknowledge my research support:

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:

personal info removed

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Nakummek! ~ Thank you!

UnikkâKatigesimajut Inuit amma Piguttulittât lutik

kiugusijuk kingullipânganit 2014

NIUKKUSIMAMINIK ULLUNGIT: June 23–29, July 16–29, August 9–24, September 12–17 anut
Erica Oberndorfer, PhD ilinniajuk (Carleton Ilinniavitsuak)

SUMMAT NIUKKUSIMAJUT:

Aipangani Aujami UKâlalaukKunga
Makkovimiunut ilukKusiminik Kanuk Inuit
piusiKamangât piguttunut. Unuttunik
unikkausiKalauttut ikKaumatgatsait
inikkausingit piguttunik atumangâta ilagenut
aullâvingani Makkovimi.

Takunnâvugut piguttunik aullâvimini
oganniavinganillu aulasagiasimaligunik
ogannivinganut. amma tupisimaKajunik
aullâvinganit takunnâtluta
atjigengitunik aullâvitsaminik taipsomangani
ikajusot ilutsingit piguttuit nunaliginni, amma
piulautitlugit tukisitluta Kanuk ilukKuset Inunnit
amma piguttunik ilageKasot

PINNIANINIGIT:

Unuttunik aujami nunagalannelaukKugut
tigusitluta allavitsanik atjigengitunik

Kanutsuatuinnanik piguttunik pigusojunik
atjigengitunillu atsâtaugutinganik oganniavinni.
takunnâlaukKugut Kanukkiak piguttuit pigusot

illukuluit
sani, amma
tupiKasimajunik
nunalet,
aullâvimi,
ilinnialaukKugut
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inunnut
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amma atuatsitluta itsasuanitaiminik suliat savut
sivunitsajavunut. ukâlautitsigumagutsi
nunaliginnimejunik pikKosiatsovugut
ukâlagiamik ilitsinut: aullâvet takunnâlautavut
ukua, Tom's Cove, Ikey's Point, October Harbor,
East and West Turnavik, Ironbounds, Malona
Point, Topik Point.

JESSICA WINTERS, KINIGATTIK IKAJUTTIK:

Jessica Winters suliaKattik Kinigattik ikajuttik pingasunik takKinik ikajusimajuk ilonnanganik suliataminik, nunagalannik itsaguangittaiminik, ilinniatluni inosuttuKainit, minguatluni piguttunik Makkoviup maligatsaminik takusonguvusi ungutâni, Jessica suliatasimajaminik sanatluni maligatsanik piguttunik, amma ikajutluni DHSD-kut suliataminik. ammalugiak suliataminik piguttunik, Jessica ikajulauttuk niukKusimajunik sikonnakkut Northern Rangeri tikiguni Mkkovimut. ikajusinga, suliatangillu pikKojakka pivalliatismagami unuttunik atjigengitunik pigatsaminik. Nakummek Jessica – pikKosiatsavunga suliaKalaugavit uvannik saniani. sivunitsagit ilinniavialunni!

JESSICAUP SULITSANGIT:

Aujami suliaKalaauKunga Ericaup saniani, pikKosialauKunga, amma

ilinniagi allalauKunga unuttunik unuttummanik itsaviguma illugusimmi aullâgiamik oganniavinnut ilinniatlunga oganniavinik pikKosialauKunga pivatsasiatlunga. suliatasaka silamelauttut ullu- tamât silami, ilinnialauKunga Kanutsuatuinnanik piguttunik nunamik omajunik amma ilinniatlunga Ericamit. UKâlaKalaauKunga inosuttuKanut ningiatlutik unikkausimaminik piguttunik. nunaliganetlungallu ilinniatlunga saniani piguttunik ilinniagattet amma aipanganik suliataminik, takutitsitlutik uvannik sivunitsatitlutik Kanuk pivallia gumamangât. âkKisiulauKunga suliatanik inosittuKait pitsanginik Makkovimi, ilinniatitsitlunga ilinniasimajaganik piguttunik amma Kanuk atuttausongumangât silatsuami atutlunga minguasimajaganik. senanik sitontinik ullu-

tamât silami suliataganik ikajusimavunga takutitlunga sugumannik pigumammangât suliataganik sivunitsagi allasongulâmatta silakKijadluni omajunnianik. silavut amma nigummittinningit takulauttavut suliatani silami ikajusimajut piulatitsimatluni uvannik piulatitsitluni pigiamik suliaKaliguma amma

Kanuk piulauitlunga imminik. pikkosiavunga suliaKalaugama suliatsanik, ilinnialaukKunga unuttunik, ilinnialaukKunga ikajuttauligutimik Labradorimut, amma suliaKalaugama nunaligijinni, imakâ tapsomanik suliatsaKalâkKunga Kangakkiak ulluni.

AIPANGIT SULIATSALET AUJAMI:

Juliami, sukkutaugunnaninganik "Amosi" aullasimagani takKajâmik sanalaukKunga takutitsitlunga Amosiup Kitunganguanganik aullâsimajumik(sanaguatausimajuk

Amos' Amazing Travelling Adventure:
From Makkovik to Bhutan in slides and film

Thursday July 17
7:00 pm, Community Hall
...
Please arrive 15 minutes before Amos' journey
Musical introduction by Kendra Jensen
Refreshments and door prize

Kitunganguak Margaret Broomfied) Makkovimit Bhutanimut (saniati Tibetimi) Kendra Jacqu ammalauttanga unnuami Nunaliginni Hâllimi pinguatluni agiamminik amma ilonnatik pikkolauttut Blanche Wintersiup igasimajaminik niKitsait,

takunnâtluta takKajâmik taipsomingani Makkoviup sanaguatausimajaminik amma mitsutausimajunik aullaligasualiguma Bhutanimut. tapkua takutitaulauttut taijaujumik Bio-Cultural Festival at the 14th Congress of the International Societykunut of Ethnobiology, June 1-7 nimut, taipsomani ilonnatik sanaguanik aullaitaulauttut. âtsitlunga

nalunaikKutaujanik ilonnanganut nakummesualaugama tâpkuninga ikajusimajunik suliaKatsaganik Bio-Cultural Festivaligani, atjiliuttausimalauttut

FROM MAKKOVIK TO BHUTAN
Craftwork and Sewing from Makkovik at the 14th Congress of the International Society of Ethnobiology, June 1-7, 2014 - Bumthang, Bhutan
Presented in appreciation to Mrs Mary B Andersen, in recognition of your contribution to this international conference
Thank you - Nakkumek - Kadrin chhe

sâlaKasimalauttut Bhutanimi. takKajânguanitluta nigittluta popcorninik takunnâtlugu atjiliusimajattavut, takujausimalittut Kagitaujakkut taijaujumik Makkovik - People and Plants (Makkovik-Inungit amma piguttungit). Jessica âkKisiulauttuk amma uKautitsitluni voginni unnuakut sananguavitsanik inosuttuKanut aujami, suguset sanangualautturaminik piguttunik amma aipangik sananguagatsanik silami. ilonnatik Kuviasutsualauttut sanaguavimmoligamit Tenistâgiup ullungani unnuakut. tapkua sanalauttut sugusiup maligatsaminik piguttunik Makkovimi. Jessica ikajulauttuk mikujunik sugusinik sananguagamik sanaguanik amma tigusiitluni piguttunik pisugiatluni silamut, amma Annie

Pikkujaliakagutsi, uKautitsaKagutsi, upvalu apitsotsaKagutsi, Kaujitsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Evans ilinniatitsilauttuk piguttunik atinganit
sanaguagiattuvimmi. Nakummek Aunt Annie
ikajulaugavit amma Kaujimatsiagavit,

Jessicamut
sanagualaugami
Kimmigguanik
âkKisuitluni
ilagetlutik, amma
ilonnainut
sanagauvilialauttut
kinatuinnait
pigumajut

Kimmigguanik, Kaujititsisonguvusi uvattinik.
Jessica âkKisuilauttuk pinguagatsanik atutluni
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ullusiuligatta Trout Festivaliup ullungani
angijualolauttuk naffâgiattungualigunik
suguset, pigiasitlutik âkKisugainit
âkKisuigiaKalauttut amma Kaujititsitlutik, amma
appalitlutik nâffanguagialiganik nunagalammi

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sanatluni atjinguaminik
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taipsumani sakKititsiniatlunga takunnâgatsanik
amma asiujiniatlunga pinkunguaganik.

2012imi, Inuit uvannik ikajulauttut
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mikijunik sennatunik
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takunnâtaujut sulî,
utakKisongugutsi
pijagettaumatta mâna,
imaKâ upingâmi
pijagetaulâttut.

Nakummek

Nakummegumavunga Carol Gear pivalliamat ikajugiamik tâpsomingat suliatSanik, amma sitontiminik ikajummat ukuninga suliatSanet. nakummegumavunga Sheldon Andersenimut amma Todd Broomfieldimut ikajulaumatta uvattinik. ilonnatik Inuit ikajulaumatta suliatSaganik- tamanelaungituagutsi suliatSaka pijageguttaungitut.

NiukKuinga pijagettuk 2014/10/15

Nakummesuavunga ilonnainik ikajugatsi tapsominga:

PikKujaliaKagutsi, uKautitsaKagutsi, upvalu apitsotitsaKagutsi, Kaujitsigajattasi:

personal info removed

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Nakummek! ~ Thank you!

The shared stories of people and plants

Fall 2014 - Winter 2015 Update

Visits to Makkovik: Oct 27–Nov 6 (2014); Jan 29–Feb 6, Mar 21–31 (2015)

Erica Oberndorfer, PhD student (Carleton University)

Purpose of the visits:

On these past three visits to Makkovik, I have been visiting with people to confirm all the details of our previous conversations about plants. When I am at home in Goose Bay in between visits, I type up our discussions about

plants — either from audio tape or from written notes — and I bring these written transcripts back to Makkovik to be checked

and corrected. The process of checking through these transcripts together ensures that I have understood everything correctly, and gives people an opportunity to change or add to their transcripts if they wish.

I would like to thank everyone for their time, effort and patience in making sure these transcripts are accurate. It means a lot to me to share this time together and to work with everyone on this project. I hope our combined efforts to document the cultural importance of plants in Makkovik will be helpful and useful to all Makkovimiut.

Activities:

Transcript review and discussions

During each of these past three visits to Makkovik, I have been focusing on reviewing existing transcripts, and asking follow-up questions about plants. Over the winter, I have also been asking new questions about the importance of wooding and wood.

Snowshoes

One way to learn about plants is by doing, or at least by watching people who know what they are doing! Thanks to Mr. Henry Jacque, I was able to watch a pair of snowshoes being made from start to finish. I even got to try doing a bit of the garnishing and filling, when I was

not stitching my thumbs together. Learning by doing really makes me appreciate how many hours go into making a pair of snowshoes, and how many more years go into mastering the skills that allow you to make those snowshoes well. Thank you to Henry for my beautiful pair

of snowshoes, which are seeing many miles of walking at home.

Plant Night

On November 4th, I hosted a Plant Night at the hall, where we got together to discuss the many different plants that are important to life in Makkovik. It was an

opportunity to learn new things about plants from each other, and to hear stories about plants from both "Them Days" and "These Days." One thing we all know now: don't eat the Deadly Nightshade! Instead, we ate Lori's blackberry pork cake and Aunt Nellie's wiener rolls – much better tasting.

Hall update presentation

On March 26 at the hall, I presented a summary-to-date of what I have learned about the importance of plants in Makkovik, based on speaking with Makkovimiut Elders and plant experts. One of the priorities of this project on plants is to put together a community book on plants of Makkovik, and I am looking for your opinions on what a Makkovik plant book should look like. Some of the topics we discussed were the importance of plants in eating, healing, celebrating, fishing, traveling, gardening, hunting, wooding, and the plants of family places. If you have ideas for what a book like this should include, I would be happy to hear from you.

Elders dinners

Thank you to the Elders and to DHSD for inviting me to the Thursday Elders' dinners. I presented three slideshows: Berry Superfoods of Makkovik, Family Places, and a summary of what we've learned about the importance of plants in all parts of life in Makkovik. We also had some homemade redberry & blackberry & blueberry ice cream.

Dog races and badminton

I love being in Makkovik because it seems like there are activities every day of the week! I got to celebrate my first Bonfire Night in Makkovik, which was wonderful. I unexpectedly got to judge the Annual Heritage Dog Team Race with Mr. John Winters in March, which was an honour. Thank you to organisers for clarifying that I was supposed to pick the best looking dogs, not the best looking drivers.

I'm also honoured to have been thoroughly thrashed by the provincial badminton champions at the tournee that same weekend – thank you to Katie Hays for inviting me to play. Thank you to Constable Barry Andersen and Travis Dyson and all the Junior Rangers for inviting me to watch their target shooting training at the gym, and thanks especially to Mandy Smith for teaching me how to shoot.

Jamboree

It was another great year for Jamboree, and a chance to rub shoulders with Makkovik's talented musicians. Maybe one day some of the talent will rub off. This year I penned some lyrics called "Music in those Snowshoes" to the tune of "Comb Your Hair Flat Down" by the Flummies. Thank you for being such a lovely and forgiving audience, and thank you to the organizers at DHSD for all the work that goes into this beautiful evening of music-making.

And as always, it's a pleasure to attend the Sewing Circle evenings and the DHSD Craft Nights. Thank you everyone for your warm welcome.

Other projects this past fall/winter:

School presentation

In November, Jessica Winters gave a presentation at JC Erhardt on her experience as an undergraduate student at Memorial University. Last summer, Jessica was a research assistant with this project. This presentation was a chance for students to hear first-hand from a JCE graduate on what life is like at university. Thank you to Jessica and Dion Rideout for making this presentation possible.

Rhubarb update

In Sept 2013, many of you were very kind to let me collect a leaf of your rhubarb patch, to see if we could learn about rhubarb diversity in

Makkovik by looking at rhubarb genetics. There is finally some news to share on this! The laboratory methods have been successful, and we are able to see that there are very noticeable genetic differences among rhubarb patches in Makkovik. How different are the rhubarbs?

Where did they come from? Have our rhubarbs in Labrador adapted over time to conditions here? We don't know these answers yet, but we hope to continue this work over the summer. Stay tuned, and please let me know if you have a rhubarb patch

and would like to know more about it. Did you know that rhubarb roots were used as a powerful medicinal plant? Rhubarb was brought to Europe from Asia over the silk road, and was once more expensive than opium!

Conference presentation

In May 2015, I traveled to Santa Barbara, California, for a conference presentation, which was co-authored by Carol Gear. The conference was called The Many Faces of Ethnobiology, and its purpose was to learn from communities all over the world who successfully live in balance with their environment. We are greatly indebted to Aunt Ellen, Aunt Nellie, Aunt Annie, and Mary B for advising us on what was important to share about people-plant relationships in Makkovik. After the presentation, many conference attendees thanked me for reading the words of Elders in Makkovik directly in the presentation. Overall, people were surprised and interested to hear about how important plants are in the north, and always commented

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:

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Nakummek! ~ Thank you!

on how beautiful the land was. People also cheered when they saw the picture of Uncle Harold with his blueberries.

Next steps:

Gardening workshops

Marilyn Faulkner will be hosting two gardening workshops in Makkovik this spring/summer. The first workshop is on container gardening on June 22 in the evening, and the second workshop is on composting at a later date. Both

workshops will be at the Craft Centre. If you would like to take part, please contact Marilyn to sign up. Thank you to Marilyn for very kindly sharing her gardening experience and developing this workshop.

Rhubarb and trout

This summer I will be in Makkovik in late July to continue verifying transcripts. I will also be giving a presentation at the community hall to provide an update on the project, and to ask for your input on content for a Makkovik plant book. With your permission, I'll be collecting a few more rhubarb leaves and asking you about your rhubarb patches to help put together the genealogy of rhubarb in Labrador. And if you need anyone to taste-test your smoked trout before Trout Fest, I will be happy to volunteer :)

Some plants to look for at this time of year:

The tulligunnak are nice and small and good for eating right now. The uKaujak (willow buds) can also be eaten with molasses.

Many different willows are flowering. One of the world's smallest shrubs is the Snowbed Willow, with only two leaves. This one was at Wild Bight up on a rocky ledge.

On Indian Head, you can see some very early flowers of Diapensia and Alpine Azalea.

Alpine Azalea on Makkovik Hill

Diapensia on Makkovik Hill

Indian Plum or Chuckley Pear is also in bloom with its white flower.

Indian plum / Chuckley Pear at Tom's Cove

If you're out egging, keep an eye out for Scurvy Grass on the islands. It's not really a grass – it's in the mustard family. It's high in Vitamin C and people used to eat it to prevent scurvy.

Scurvey grass

You can also eat the Beach Greens that grow on the seashore, and they are quite tasty.

Beach greens by Indian Head

Thank you

Thank you to the many people whose knowledge is the foundation of all this work, and who are so generous with their time. I would also like to thank Marilyn Faulkner for preparing the gardening workshops, DHSD, Makkovik Inuit Community Government, Junior Rangers, DHSD, and Carol Gear for all her guidance.

Questions? Comments? Suggestions? Please contact Erica Oberndorfer:
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Nakummek! ~ Thank you!

Music In Those Snowshoes

To tune of "Comb Your Hair Flat Down," by the Flummies

It's winter in Makkovik and the snow is soft and deep
Walking round is hard – the drifts are high and wide and steep
So I went up to Henry Jacque's, I found him in his shed
He said we'll turn some snowshoes to give you better tread

He cut a stick of juniper and fired the steambox high
Then he curved the bows into their shape and set them there to dry
He fixed the beams, the garnishing, the filling, straps, the slings
I'd never seen such snowshoes, they were such pretty things

When he was done then Henry said, let's go outside and try
And once I had those snowshoes on, I felt like I could fly
I waved my thanks to Henry and to his family
And I snowshoed round Makkovik to see what I could see

Chorus:

*When you're wearing snowshoes, you can't help but sing
Walking through the woods and you're as rich as any king
The rhythm in your step and the heartbeat in your ear
The music in those snowshoes is what I love to hear*

I snowshoed past the post office and the RCMP
Barry had to ticket me for excessive speed
I ran down past Aunt Annie's where the dogberries grow red
I snowshoed past the fish plant all the way to Hebron end

I climbed up over the boardwalk til I could climb no higher
I ran down past the fire hall - they thought I was on fire
I snowshoed past the radio so listeners understood
That Goose Bay girl is nuts but her snowshoes are ugly good

Chorus

I snowshoed to the school and all the kids came out to look
Sophie Tuglavina said, who made your fine Tallot?
I ran to Ranger Bight and back and down to Laura's Lane
Where I was passed by Charlene Ford - well, she could run to Nain

I snowshoed by Aunt Nellie's house and I could plainly see
Her sewing needle and thread were moving twice as fast as me
Aunt Ellen waved and Uncle Harold was out with gun and cartridge
He said, you snowshoed half Makkovik and you never got one partridge!

Chorus

I thought of running out to the McNeills at Island Harbour
But I confess that I'd grown cold and I could run no farther
So I followed in my tracks and ran back home to Randy and Lori
And here's the funny part of my Makkovik snowshoe story

Those snowshoes that I loved were frozen solid to my feet
I had to keep them on to eat and drink and shower and sleep
I'm waiting for a good spring thaw and then with any luck
I'll once again be able to work the pedals in my truck

Visit report completed June 8, 2015

I gratefully acknowledge my research support:

AviKatiget unikkauset Inunnit amma Pigutsait:

Ukiumi 2014 - Ukiami 2015 takunitsigiallait

niukKusimajuk Makkovimut: Oct 27–Nov 6 (2014); Jan 29–Feb 6, Mar 21–31 (2015)
Erica Oberndorfer, PhD ilinniajuk (Carleton Ilinniavialungani)

Summat NiukKusimajuk:

Tapkuningani pingasunit niukKusimajumit
Makkovimut pulâgiasimajuk Inunit
pitivimmivânit ilonnainit
uKâlautiKalauttanganit
pigutsanit. Angiggameliguma Goose Baimi
pulâgialiguma, nenitsiutiKattavunga
uKâlautivunit pigutsanit – uffalu
uKâlautikulumut uffalu allasimajaganik–amma
ablasângajuttaujut utitiKattajakka Makkovimut

takujaulâmmatta âkKisiugiaKamamillu.
âkKigiaKatlapunga ilingajugiaKamatta
tukisianattolâmmatta, amma Inuit
pivitsasongujut tautsesongulâmmatta uffalu
iligiattaKamangât allatausimajut
tukilitsiumangâmik.

Nakummegumavunga ilonnanik sitontiminik,
ikajulaumatta amma inisittigiaminut
tukiliutlamangallu ablasângajuttaunet

piujomangâttallu. tukitsiaKajut uvannut
nigiasagamik sitontivut ilagetluta amma
suliaKatlunga ilonnainut
suliatsaganik. nigiuppunga ilagetluta
katiKattigetluta allatausimajut ilukKusivut
ikKanattut pigutsainut Makkovimi
ikajusongulâmmatta amma atutausongulâmmatta
Makkovimiunut.

Sulingajut:

tittigattaumajut Kimmigugiallait amma uKâlaulingit
NiukKusimajanginit pingasunit Makkovimut,
ikKautijakka takunnâgiatlunga
pitaKappumangât allasimajanganit, amma
apitsitlunga pigutsanit. Ukiakkut,
apisogiallasimavunga nutânnik apitsotiniK
ikKanattunik Kijuttagianik amma Kijunik.

Tallot

atautsik ilinniatausot
pitgutsait pitauguni,
uffalu
takunnâtauguni Inuit
Kaujimajut Kanuk
sanaliguni!
Nakummek Henry
Jacque,
takunnâlaugama
sanajumik tallonik
sanattauliganik
pigiasitluni
pijagetlunillu. OttulauKunga mitsugiamik

amma Kilugiamik,
Kangalli
mitsungituaguma
kulluganik.
Ilinniagiasonguvugut
pituinnagutta
nakutlapunga Kanuk
sitontinik pigiaKattatut
sanaligunik tallonik,
amma Katsinigiallak
jârinik iligaik
iligiaKajut piutjutsuanik sanagiamik
tapkuninga tallonik. Nakummek Henry Jacque
tallosiaganik, takulittok unuttunik pisuliguma
angiggami.

pigutsait unnuangani

Novimpara 4-mi, tujummiaviKalaukKunga
unnuami hâllimi, Ilagetitluta UKâlautiKatluta
unuttunik atjigengitunik pitsainik ikKanattunik

Makkovimi.
PivitsalaukKunga
ilinniagiamik nutânik
pitsannik
ilagetitluta,amma
tusâtlunga unikkausinik
pigutsanik tamamminik,
Them Days amma These
Days, atautsinga
KaujimalikKugut manna:
NigigiaKangilasi
taijaujumik Deadly
Nightshade! ketaltuinak
nigilaukKugut Loriup puaKajuk paunganganit
kekkimik amma Ajak Nelliup usojait
niakošanasik-
piluumik
mammatoKajut.

Hâlliup nalunaisivik

Marchi 26 hâllimi, nalunaisilaukKunga
nânigani-ullumut ilinniasimalauttaganik
ikKanattunik pigutsait Makkovimi,
uKâlautiKatlunga Makkovimiunut
InosittuKainut amma pigutsait
Kaujimsiajunut. atautsik ikKanattut
suliatsaganik pigutsainit katititsigumavunga
nunalet Kimigguaganik Makkovimi, amma
Kinivunga ilitsinit Kanuk Makkovik, pigutsait
Kimigguanga sanagatausok. Ilangit
uKâlautiKalauttavut ikKanattut pigutsanut
nigigausot, âkKisisot, ullusiutausot,
iKalunniatausot, aullaviffimisot,
pigutsevittausot, Kijuttagiavi,amma pigutsait
ilagengit ingigautingit. ikajusongutsi Kanuk
Kimigguak âkKitaugiaKamangât,
pikKoniakKunga tusagiamik ilitsinik.

InosittuKait nigigiattuvinut

Nakummek
InosittuKainut
amma DHSD-
kut
KaikKujilaumat
Tonistâgimi
InosittuKait

nigigiattuvinganut. nalautsilaukunga
pingasunik atjiliugutunik: Paungait NiKitsinginit
Makkovimi, Ilaget aullavitsangit,amma
nâninganik suliatsaganik. nigilaukKugut
sanattausimajunik kimminaujanik,paunganik,
amma kigutannginnanik paunganik
Kuajosimajunik.

Kimutset amma Pattanguannik

Nagigitsuavunga Makkovimigiamik sotagga
solu nukKaKattangitut ullu-tamât vogikkut!
taijauluakKunga ikajutlunga jârikkut
ullusiuvingani Kimutsikut John Winters
Marchimi, nittaulauttaga. Nakummek
âkKisiulauttut uKautitlutik uvannut
nalutsigiaKalaukKunga piunippânik
Kimutsimik, piunippângutimik sanguattunik.

nittutaulaukKungallu sâlauttaulaugama
pinguagata pattanguamik tapsomungasiak
vovingani- nakummek Katie Haye
KaikKujilaugavit uvannik pinguagiattuvinut.
Nakummek utitutisijik Barry Andersen amma
Travis Dyson amma ilonnatik Junior Rangeret
inuKatilaumatta uvannik takunnâitsilaumatta
Kukinguagiattitlutit pinguavialummi, amma
nakummesuak Mandy Smith
ilinniatsilaummat uvannik Kanuk Kikigiamik.
nakummek.

Tutsiavingit

piujolaummijut jâringa tutsialammigatta,
amma ilagetluta Makkovimiut
tutsiaKatigengillu tutsiajunik. imaKâ
Kangakkiak ilisongulâkKunga tutsiagiamik.
Jârini pilaukKunga tutsiagaluatimik taijaujumik
"Tursiagalait tallominik" malitlugu
tutsiatausongujumut "ilialaluguk
manigattumik ungutânut" tutsiajausot
Flummies. nakummek nâlalaugatsi
nagligitotlusi amma isumagijunnailaugatsi
tusannitunik, amma nakummek taipkuninga
âkKisiulauttut DHSD-kut ilonnatik
suliaKatsanik piujutsuanillu unnukut
tutsiagalannik ammalieu, nakummek
nipigutivunga ilaulaugama sananguattuvinut
tutsiagaluani- sanalaugatta.

ammaliillu, nipigutivunga ilaugama
mitsugiattutlunga unnuni amma tapkua DHSD
-kut sanaguagiattuvinut unuami. nakummek
ilonnasi nigumittumik Kujannamelaugatsi.

aipangit suliansangit:

Iliniavet aittotingit

Novimparami, Jessica Winters aittotiminik
uKâlalauttuk JC Erhardt Ilinniavingani
ilisimajamminit ilinniavialuni. kingullipâgani
aujami, Jessica Kinigaujatigilauttuk suliansanik.
Tanna aittotaminik sakKititsilauttuk
sugusinu tusatitluni -JC Erhardt
ilinniasimajumik Kanuk inosinga pilaumangât
ilinniavilummi. Nakummek Jessica amma Dion
Rideout sakKititsilaugamek sakKititsijinik
suviKattuminik.

sennatut mannakut

Siptimara 2013, unuttusi inugunnitolaukKusi
uvannut nuappâgama mappatânik sennatunik,
takunnâtlunga ilinniagialladsongujunitsanik
sennatunik pitaKalikKuk nutânnik ningianik
tapkuninga! Kinigautialuit sanautingit
sivunitsaulauttut, amma takunnâsonguvugut
malugusutluta KinigaugiaKajunik.
atjigenngitunik sennanatunik ingigauaset
Makkovimi. Atjigengitunik sennanatot? Nakit
sakKisimamangât? sennanavut
sungiuattlusimamangât maligatsamini mâni?
Kaujimangilagut sulii, keta
sivunitsavugumavugut suliansanik

PikKujaliaKagutsi, uKautitsaKagutsi, upvalu apitsotsaKagutsi, Kaujitsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

aujami. Nălagitsi, amma aliakkapagitsi uvannik
Kaujimatitsigutsigumagutsi sennanatonik
ingigautiKaguni amma
Kaujititsimagiallagumagutsi tapkuninganik.

Kaujimaven
sennantut
atuttaulauttut
ănniasiuivitsanik
pigutsainit? Sennanat
aijauluattut
Europimit Asiamuut
akKutikut killagittunit
akKutikkut, amma
akitojoluangulauttut
opiumimit!

katimavivut sakKititsijet

Maymi 2015, aullalaukKunga Santa
Barbaramut, Califrnia, katimagiattutlunga
sakKititsigittutlunga, ikajutigallu Carol
Gear. katimavitsavut taijaulauttuk unuttut
kenait unnutut omajualunik, amma
sulimammangăt ilinniagiaKajavunit nunalinit
nanituinnak silatsuanni savatujut inlijut
annisivăjut silatsuamini.

Nakutlasuavugut Ajavunut Ellen, Ajavunut
Nellie, Ajavunut Annie, amma Mary B Andersen
uKattapălaumatta uvattinut ikKanattunik
ningialaumatta Inuinit-pigutsait ilagetitnik
Makkovimi. siagugiak sakKititsinik, unuttuit
katimalauttut Kaisimajut nakummelauttut
uvannik atasilaugama uKasinik InosittuKainik
Makkovimi aulappănut
sakKititsijiganik. ilonnangillu, Inuit
tattamilauttut amma kamagigumalauttut
tusagiamik Kanuk ikKanattut pigutsait takkăni,
amma uKaKattalauttu Kanuk pikKosijut
iniKannatumangăt nunavuttini. Inuit
Kuviasulauttut takugamit atjiliumik akkavut
Haroldimik kigutanngiganit tigumiajumik.

Suliatsagiallangit:

Marilyn Faulkner tujunniuvilăttuk magoonik
pigutsevinik
suliatsanik
Makkovimi
Kaijumik
Upingămi/
Aujami.
sivullipănga
suliatsangit
ilinniatitsilăttut
Kanuk
ilulikKunik
pigutsevimik
June 22, amma
aipanga
suliatsanga
sujusimajunik
siagugiak ullungani. suliatsat
sanaguavimmelăttok. Ilinniagumagutsi,
apitsusonguvusi Marilyn tigusiniatluni atinit.
Nakummek Marilyn tunganuttalaugavit
ilangippălaugavit pigutsivimik Kaujimagavit
ăkkisuigiamik suliatsamik.

Aujami Makkovimelăkkunga Juliami
pivalliatlunga titigatlaumajunik
ablasăngajunik. sakKititsilăkkunga nunalinni
hăllimi takutisiltunga sunanik
naffăsimajakkanik, amma apigittlunga ilitsinik
sunanik pigumagutsi Makkovik pigutsiangit
Kimigguani.

apigiKătInga, Kaligautilăkkunga sennanunik
mappatănik amma apigitlunga ilitsinik
sennanatonnit pigutsevinik ikajulămmat
ilagettunik nakik tinkisimamangăt sennatut
Labradorimi. amm ottugumagutsi- tisamik
isigatsamik iKalunik, iKaluniavik tikiKănagu
ullusiuvinga, Kuviasulăkkunga ottugiamik.

pigutsait Kinijausot mâna jârîkkut:

Tulligunnak piujutsuat amma mikijut amma
mammattut nigigiamik manna.uKaujak
nigijausollu molassinut.

unuttunit atjigengitut upigait, maggolet
mappatânîk pitalîk. pigusot ujugaglannîk –una
Kaijuk Wild Bightimik.

Indian nuvugani, takusonguvusi ilangani
ullasiutinîk piguttunik taijaujnik Diapensia
amma Alpine Azaleanik.

Indian Plum uffalu Chuckley Pear pigutsiajut
KaKuttak piguttuk.

PîkKujaliakagutsi, uKautitsakagutsi, upvalu apitsotitsakagutsi, Kaujitsigajattasi:

personal info removed

Facebook: "Makkovik - People and Plants" ~ University website: <http://straightupnorth.ca/Sikuliriji/Oberndorfer.html>

Nakummek! ~ Thank you!

Mannisiuliguit, kamagitsi taijaujmik Scurvey
ivitsuKait kikittami. ivitsuKaingungituk-
ilageKajt Mustard ilagenganik. unuttunik
pitaKajuk Vitamin C-nik amma Inuit
atuKattalautangit nigitlutik Kanimangilâmatta
Scurvimit.

Nigigiallasonguvutit sitjagiap iviumik pigusot
sitjagiami, amma mamattongujut.

Nakummek

Nakummek ilonnanut inunnut
ilitsisimajualujunnut tungavinut ilonnainut
suliaKatsanik, amma tapkua
angitsaitausimajut sitontiminik.
Nakumegiallagumavunga Marilyn Faulknerimut
âkKisuilaummat pigtsevimit suliataminik,
DHSD -kut, Makkovik Inuit Nunalet Gavamaga,
Junior Rangeret, DHSD, amma Carol Gear
ilonnaminik maliKatigelaummat.

NiukKuinga pijagettuk 2015/06/08

Nakummesuavunga ilonnainik ikajugatsi
tapsominga:

Appendix O Introductory pamphlet

People and Plants

- **People and plants** have a long history of shared relationships
- **People** practice these relationships in many different ways: for example, through harvesting, caring for plants, and through storytelling. The lives of people are influenced by their relationships with plants.
- **Plants** are also influenced by people, and have their own stories to tell. In some places, certain plants or plant communities are found at important cultural sites. Plants can act as 'footprints' of human presence on the land.

Research Interests

- I am interested in the dynamic relationships between people and plants in Labrador – a place where people continue to value and depend on the land, and where relationships with plants remain important. Personally, it is important to me to learn from the people and plants of my new home.

Inuit ammalu Pigutsiat

- **Inuit ammalu pigutsiat** akuni Kaujimajaujunik ikajuttigesimajut
- **Inuit** ottugaKattajut tamakkuninga ikajuttigennimik Kanutuinnak adjigengitunik: ottotigillugu katitsuinikkut, paitsinimmik pigutsianik, ammalu unikkausikkut. Inosigijangit inuit attutauKattavut Kanuk inosiKaniammangâmmitt pigutsianit.
- **Pigutsiat** attutauKattamijut inunnut, ammalu namminik unikkausiKammijut. Ilanginni inuijuni, pigutsiat upvalu pigutsialet nunalet napvâtauKattajut ikKanattunit ilugguset inigijaujunut. Pigutsiat attutausot sollu 'tumigijaullutik' inunnut iniKasimanninginnut nunatsuami.

Kaujisannik KanuttogutiKannik

- KanuttogutiKatsiamagivunga atuniKatigejunik akungani inunnut ammalu pigutsianik Labradorimi – inik suli inuit atuniKatsiamagijut ammalu najuttiKajut nunatsuami, ammalu ikajuttigenikkut tamakkuninga pigutsiat suli ikkanattumagijunut. Uvannuli, ikkanattumagik ilinniagiamit inunnit ammalu pigutsianik nutâk aniggagilittaganik.

Unikkautigijausimajut inunnit ammalu pigutsianik

Ilinnianik pitjutigillugit nunalet sivulliutitaugialet ilingajunut pigutsianik Kaujisannik

The shared stories of people and plants:

Learning about community priorities for plant research

Community research priorities

- Communities have their own priorities for research. Visiting researchers need to understand and respect these priorities, and look for common ground with their own interests.
- I would like to consider a research project in Makkovik. To do this, I would like to better understand:

- Local interest in plants
- Community research priorities on the topic of people and plants: What do people want to know more about?
- Community expectations for visiting researchers
- How research should contribute to the community

Your feedback will help identify research questions, shape the research process, and inform future work.

I hope to spend time in Makkovik in summer 2012 and onwards. If you see me in town, please come say hi!

Nunalet Kaujisannik sivulliutitaugialet

- Nunalet namminik sivulliutiKajut Kaujisannikut. NiugguKattajut Kaujisattat tukisigialet sivulliutitaujunik, ammalu takunnâlutik taimâtsainak takunnâgialet Kanuttogutigijaujunik.
- Kaujisagumavunga Makkovimmi. kajusigiamut, tukisitsiagumavunga:

- Nunalet Kanuttogutigijaujut pigutsianit
- Nunalet Kaujisagiamut sivulliutitaujut pitjutaujunik inunnit ammalu pigutsianik: Sunanik Inuit Kaujimaluagumajon?
- Nunalet nigugijangit nunattinoKattajunut Kaujisattinit
- Kanuk Kaujisannik tunitsijutsaumangât nunattinut

UKausigijatit ikajulangajuk nalunaitsigiamik Kaujisagiamut apitsotitsanginnik, piusitsanganik Kaujisagiamut, ammalu Kaujitsiluni suliat augajattunik sivunittini. KanuttogutiKavunga Makkovimmegiamik aujami 2012 ammalu tamângat. Takugutsi uvannik nunanni, KailaulâkKutit atsunaigiattulutit!

About Erica

Hello – my name is Erica Oberndorfer. I live in Goose Bay and am studying for my PhD through Carleton University. I enjoy time outdoors with plants, particularly bakeapples...

Pitjutigillugu Erica

Atelihai-atiga Erica Oberndorfer. NunaKavunga Goose Bay-mi ammalu ilinniaivunga pitâgasuamut puttunippâmik taijamik PhD-mik Carleton ilinniaivitsukut. Piutsavunga silamegalagiamik pigutsiagalannik, piluattumik appinik...

If you have any suggestions, comments, or questions, please contact: / PikKujaliaKagutsi, uKautitsaKagutsi, upvalu apitsotitsaKagutsi, Kaujitsigajattasi:

Erica Oberndorfer
Carleton University
Dept. of Geography & Env. Studies
personal info removed

Thank you - Nakummek!

Appendix P Introductory pamphlet, revised with research goals

People and Plants

- **People and plants** have a long history of shared relationships
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- **Plants** are also influenced by people, and have their own stories to tell. In some places, certain plants or plant communities are found at important cultural sites. Plants can act as 'footprints' of human presence on the land.

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- **Pigutsiat** attutauKattamijut inunnut, ammalu namminik unikkausiKammijut. Ilanginni inuijuni, pigutsiat upvalu pigutsialet nunalet napvâtauKattajut ikKanattunit ilugguset inigijaujunut. Pigutsiat atuttausot sollu 'tumigijauullutik' inunnut inikKasimanninginnut nunatsuami.

Kaujisannik KanuttogutiKannik

- KanuttogutiKatsiamagivunga atuniKatigejunik akungani inunnut ammalu pigutsianik Labradorimi – inik suli inuit atuniKatsiamagijut ammalu najuttiKajut nunatsuami, ammalu ikajuttigenikkut tamakkuninga pigutsiat suli ikkanattumagiujunut. Uvannuli, ikkanattumagik ilinniagamit inunnit ammalu pigutsianik nutâk aniggagilittaganik.

Unikkausingit Inuit amma piguttungit

ilukKusingit amma nunamiutangillu ilagengit Inuit amma piguttunginut Makkovik, Nunatsiavut (Labrador)

The shared stories of people and plants

Cultural and ecological relationships between people and plants in Makkovik, Nunatsiavut (Labrador)

Project goals

Thank you to everyone who spoke with me in 2012/2013 about their priorities for research on people-plant relationships in Makkovik. This project focuses on two of these interrelated priorities, which are:

"The stories people tell about plants"

- To help document the plant knowledge of Makkovimiut, in order to better understand the importance of plants to life in Makkovik.

"The stories plants tell about people"

- To learn more about how plant communities in and around Makkovik reflect the important role of people in their growth and development.

This project also aims to work towards project outcomes identified as important by Makkovimiut, particularly:

- Developing a guidebook to plants in Makkovik
- Documenting the plants of culturally-important areas
- Supporting opportunities for young people to learn about plants
- Supporting the inclusion of plant knowledge in local programs for wellness, education and tourism

Suliatsangit

Nakummek ilonnasi uKâlalauttut uvannut 2012/2013-ami unikkausinganit Kinigatsanganit Inuit-Piguttulu ilagettunit Makkovimi. Tapkua suliatsait maggonik katiKatigejok suvullipânik, Tapkua allattaujut:

"unikkausingit Inuit unikkausijut piguttunik"

- ikajujut piulitsijutlunit piguttuit Kaujimajamminik Makkovimiut, tukisisiattausongulâmatta suliKajuminik piguttuit Inunnut Makkovimi.

"unikkausit piguttungit uKausijut Inunnit"

- Ilinniattlutik unuttunik Kanuk piguttuit nunalimini iluani amma nanituinnak Makkovimi takujaumangât suKutigijisujut Inunnut nunaligijimini.

Tanna suliatsalet suliKagasuajuk suliatsaminut pijagegumajunganut suKutigijisumamangât Makkovimi, sulluli:

- âkKisugumajut Kimmigguamik piguttunik Makkovimi
- Piulitsitlutik piguttungit ilukKusiKajut-suKutigijaujut tamanejunik
- ikajutlutik pivitsangit inosuttunut ilinniasongulamatta piguttunik
- ikajutlutik Kaujimasongulamatta piguttunik ikajusongujunik sulliviminik, ilinniavitsait amma niukKujunik

About Erica

Hello - my name is Erica Oberndorfer. I live in Goose Bay and am studying for my PhD through Carleton University. I enjoy time outdoors with plants, particularly bakeapples...

Pitjutigillugu Erica

Atelihai-atiga Erica Oberndorfer. NunaKavunga Goose Bay-mi ammalu ilinniavunga pitâgasuamut puttunippâmik taijamik PhD-mik Carleton Ilinniavitsukut. Piutsavunga silamegalagiamik pigutsiagalannik, piluattumik appinik...

If you have any questions or comments, or would like to be involved in this project, please contact: / apitsotikaguvit uffalu uKâlagumaguvit, ufflu ikajugumaguvit tapsominga suliatsanik, tapsuminga uKâlasonguvus:

Erica Oberndorfer
Personal info removed
Thank you - Nakummek!

Appendix Q Summary of visits to Makkovik

Visit no.	Year	Visit dates	No. days
1	2012	Jul 20-26	7
2	2012	Sep 4-7	4
3	2013	Feb 18-22	5
4	2013	Jul 15-22	8
5	2013	Aug 12-26	15
6	2013	Sep 10-20	11
7	2014	Feb 3-10	8
8	2014	Mar 14-28	15
9	2014	Jun 23-29	7
10	2014	Jul 16-29	14
11	2014	Aug 9-23	15
12	2014	Sep 12-17	6
13	2014	Oct 27-Nov 6	11
14	2015	Jan 29-Feb 6	9
15	2015	Mar 21-31	11
16	2015	Jul 16-23	8
17	2015	Aug 10-19	9
18	2015	Oct 19-23	5
19	2016	Jan 28-Feb 5	9
20	2016	Apr 15-23	9
			186

Appendix R Approved written consent form (Carleton Research Ethics Board)

CONSENT FORM

The shared stories of people and plants: Cultural and ecological relationships between people and plants in Makkovik

I have been informed of what it means to participate in this project, and I am willing to participate in **interviews** (including travel on land or water, as appropriate) or **focus groups**. I understand that by participating in project activities I may be **photographed** and **recorded by audio or video**. I may also contribute **pictures, video, mapping** information or **GPS** points/tracks. I would like to contribute to:

- i. The documentation of plant knowledge in Makkovik, and;
- ii. Sharing plant knowledge within the community of Makkovik, and with non-residents (visiting researchers, tourists, other people who are interested in learning about people-plant relationships in Makkovik). My contributions can be used in the project under the following conditions.

Identification

I remain the owner of the information and opinions I have contributed, but for the publication of project results and sharing this information with others I wish to be identified in the following way (*check one*):

- ☐ I **DO** want my name to be used to provide due credit (my name may appear alongside the knowledge I have shared). I can always choose to remain anonymous on a case-by-case basis, in discussion with Erica.
- ☐ I **DO NOT** want my name to be used, but general acknowledgement can be provided (for example: "Resident of Makkovik")

Sharing of information

I understand that information and opinions I share will be used to compile and communicate the results of this project in **reports, publications, or related project outputs** (e.g. plant guide, posters, videos, presentations, news items, websites). Therefore, I understand that the results of this project (created by plant experts in Makkovik and Erica Oberndorfer, PhD student) will be publicly available to a broad range of people within Makkovik, across Nunatsiavut, and within and outside Canada. In making my contributions publicly available, I wish to (*check one*):

- ☐ **Share my contributions freely** (i.e. my original recordings or quoted statements can be used to add context and detail to collective results)

OR

- ☐ **Only share my contributions in a summarized or collective manner** (i.e. my feedback will be considered and incorporated, but my original individual contributions cannot be identified)

In addition, I agree to have **original** audio, video, or photo recordings stored and accessible for future use in (*check all that apply*):

- ☐ **My local community** [e.g. White Elephant Museum, Makkovik Inuit Community Government (MICG)]
- for community use (i.e. the museum or MICG would approve other external uses)
- ☐ **A Nunatsiavut archive** (e.g. Torngasok Cultural Centre)
- for public use (i.e. the centre would approve external uses)
- ☐ **In the StraightUpNorth lab** at Carleton University
- for educational and research use (i.e. in consultation with Erica Oberndorfer, Dr Gita Ljubicic would approve involvement of future students or researchers based on their interest in furthering project priorities)
- ☐ **None of the above**, I want original recordings used only in this project, not for any future uses

*I understand that I may change my levels of consent, and/or that I may withdraw from participating, **within two months** of reviewing my contributions and/or initial results. I have asked any questions I had, I understand the levels of consent provided here, and I freely agree to participate in the project as outlined above.*

Participant Consent:

Print name: _____

Sign name: _____

Verbal consent, check here: ☐

Date(s): _____

Researcher Consent:

As you agree to participate in this project, I, _____ promise to respect the context of the knowledge and opinions you contribute to this project, and the terms of this consent form.

Interpreter/Contractor Consent:

As I agree to work for this project as an interpreter or independent contractor, I, _____ promise to respect the context of the knowledge and opinions you contribute to this project, and the terms of this consent form.

If you have any questions or concerns about this project, or the consent you have provided, please contact Erica Oberndorfer, Carol Gear (Community Liaison Officer), or the Makkovik Inuit Community Government:

Carleton University

Gita Ljubicic (PhD supervisor)
personal info removed

Erica Oberndorfer, PhD student

personal info removed

**Contact information for students or
other researchers involved.**

Inuit Community of Makkovik

Carol Gear (Community Liaison Officer)
personal info removed

Carleton University Research Ethics Board

Prof. Andy Adler (Chair)
Personal info removed

Nunatsiavut Government

Carla Pamak (Inuit Research Advisor)
personal info removed

Notes:

Appendix S Approved oral consent script (Carleton Research Ethics Board)

Project number: 14-0165

The shared stories of people and plants: Cultural and ecological relationships between people and plants in Makkovik, Nunatsiavut (Labrador)

-Erica Oberndorfer, PhD Candidate

-Dr Gita Ljubicic (supervisor)

-Department of Geography and Environmental Studies (Carleton University)

Oral consent script

Project idea and goals

The idea behind this project is to better understand the role of plants in the lives of Makkovimiut, and also to better understand how Makkovimiut are important to plants. When I have asked community members about priorities for research on people-plant relationships in Makkovik, many people have advised me that there is a need to document plant knowledge in Makkovik. Elders and youth have both recommended that younger generations would benefit from learning more about plants. Makkovimiut have also pointed out that plant knowledge could make important contributions to education, health, and tourism programs in Makkovik. The goal of this project is to help document and communicate the plant knowledge of Makkovimiut.

How this project will work, and how knowledge will be shared

As part of this project, I will be speaking with plant experts in Makkovik about their experiences with plants. I hope to speak with many different people about such topics as wild plants, gardening, trees, plant harvesting, and how people care for plants and habitats. These different perspectives on plants will be gathered together to create written and electronic documents on people-plant relationships in Makkovik: for example, a guidebook to local plants, audio/video clips on the Makkovik webpage, or posters for the school. These discussions about plants may also be used on other websites and in journal articles, which can be viewed by people outside Makkovik and outside Nunatsiavut. I am a PhD student at Carleton University, and this project is a part of my program there.

Asking permission to be interviewed

May I have your permission to speak with you about plants in Makkovik and to share these discussions with Makkovimiut and people in other communities? Your comments could be shared in writing, as well as through audio or video, depending on your preferences.

Asking permission to use your name

May I have your permission to use your name in this project? For example, a publication might quote something you say in our discussions, and give your name alongside your comment: “Mr. John Smith uses Juniper for his wood carvings.” Or would you prefer to remain anonymous? You can also choose to have your name used on a case-by-case basis at a later date, once you have reviewed your comments on paper/audio/video.

Asking permission to store your comments

May I have your permission to store your comments in the White Elephant Museum in Makkovik (on paper, on audio, or on video), for future Makkovik community use?

May I have your permission to store your comments in the Torngasok Cultural Centre, for future use by other people in Nunatsiavut?

May I have your permission to store your comments at Carleton University, for future use in education and research?

Erica’s agreement

I promise to respect your decisions on how you would like to participate in this project, as we have just discussed. I promise to provide you with a copy of the notes, audio, video, and photos of our discussions together. You will have the opportunity to review all of your comments and make changes before any of the discussions are made public.

If you have any questions about the project, please ask me at any time. You can also speak with Carol Gear (Community Liaison Officer in Makkovik, and research partner) to privately express any comments or concerns. In addition, you can speak about this project with my supervisor Dr Gita Ljubicic (Carleton University), Carla Pamak (Inuit Research Advisor), or the Carleton University Research Ethics Board.

(I will provide contact information for all of these individuals/bodies, as well as a project summary pamphlet)

Appendix T Contact information accompanying written and oral consent

Contact list for questions, suggestions, concerns about this research project

*If you have any questions about this project, please ask me (Erica Oberndorfer) at any time. There are also other people you can contact to **anonymously express any questions, suggestions or concerns** you have about this research. These contact people are listed here, and they will relay your anonymous message to me, or speak to me on your behalf.*

Erica Oberndorfer, PhD student
Department of Geography & Environmental
Studies, Carleton University
(personal info removed)

Gita Ljubicic
Academic supervisor, Carleton University
(personal info removed)

Carol Gear
Community Liaison Officer
Nunatsiavut Government
(personal info removed)

Fran Klodawsky
Interim academic supervisor, Carleton
University
(personal info removed)

Carla Pamak
Inuit Research Advisor
Nunatsiavut Government
(personal info removed)

Carleton University Ethics Research Office
Phone: (613) 520-2600, ext 3591
Email: curo@carleton.ca
Postal address: 1301 Dunton Tower, 1125
Colonel By Drive Ottawa, ON, Canada, K1S
5B6
Project number: 14-0165

The shared stories of people and plants: Cultural and ecological relationships between people and plants in Makkovik

Appendix U Discussion themes and possible questions

Plants and worldviews

- How are plants related to other beings? i.e. birds, insects, animals, the land?
- How are people and plants related?
- Do people and plants play certain roles in each other's lives?
- Do people have certain responsibilities towards plants?
- Do plants have certain responsibilities towards people?
- How do people show respect for plants?
- What happens when humans don't show respect for plants? Are there consequences for people? Are there consequences for plants? Are there consequences for other creatures?
- Do people in Makkovik have unique ways of relating to plants? Why is this the case/why not?
- How would you describe these unique ways of relating to plants?
- How do you think these unique ways of relating to plants in Makkovik came to be?
- Do you see connections between plants and culture? How so?

Plants and language

- Are there any places near Makkovik that have plant names, or are named after plants?
- How did these places get their names?
- Do you have any personal stories about these places with plant names?
- Do you have your own names for places that are special for plants? Do other people know these places by these same names?
- Do plants have multiple names? Examples
- Do plants have both English and Inuttitut names?
- Do some plants only have English names?
- Do some plants only have Inuttitut names?
- Are there any other languages that people use for plant names, or for describing plant harvesting, products made from plants, etc. (e.g. Norwegian, German)?
- Why do some plants referred to by their Inuttitut name, and others are not?
- What are the names used for different parts of the plant (e.g. bud, stem, leaf)?
- If you were teaching another person about a plant, in which language would you name it? Why?

Plants and learning/teaching

- Where/from whom did you learn about plants (e.g. parents, school, books)?
- How did you learn about plants (i.e. please describe the process – outdoors, by harvesting, by looking in a book)?
- Where did you learn about plants?
- Has any of your knowledge about plants come from outside Makkovik (e.g. in your travels, from outsiders and visitors)?
- Have you taught other people about plants, or shared your knowledge about plants? How? With whom (e.g. friends, children – not specific names of people)?
- Have you shared plant knowledge with people outside of Makkovik?
- Is learning about plants important for young people? Why?
- Has the process of learning about plants changed over your lifetime?

Individual and group knowledge about plants

- Are there plants that everyone knows? Which ones? Why are these plants familiar to everyone?
- Do some people have specialized/unique knowledge about plants? Why? How would they have learned this?
- Are there differences in the plant knowledge of men and women?
- Are there differences in the plant knowledge of children, adults, Elders? Between families?
- Is all plant knowledge freely shared, or available to everyone if they are interested?
- Are there some types of plant knowledge that are not meant to be freely shared?

Stories and memories about plants

- Are plants important to you? For what reasons?
- What are some of your memories about plants?
- Do you have memories about plants from when you were younger?
- Do you know any stories about plants that happened before you were born, or that happened to other people? Are these stories that other people know, too?

Plants of family settlement areas

- How do families decide where to locate their cabins?
- Do plants play any role in deciding where to locate a cabin?
- Do you gather plants at your cabin?
- How far do you travel from your cabin to gather plants?
- How do you select places to gather plants?
- Are certain harvesting areas owned by certain people? Do certain harvesting areas belong to certain families?

Conservation of plants and habitats

- Are there any rules/guidelines/protocols for harvesting plants?
- Why are these rules/guidelines/protocols in place?
- Are certain behaviours/ways of harvesting harmful to plants?
- Are there seasonal restrictions on harvesting plants?
- Are there any areas that are protected/off limits for harvesting plants? Why? How are these places protected?
- How do people care for these species areas?
- Do you harvest in the same places every year? Are there some places you harvest only every 2nd/3rd year? Why? Which species grow in these places?

Wild/cultivated/feral plants

- Do you make any distinctions between garden and wild plants?
- Can garden plants grow “wild”? Can you give any examples?
- Do you make any distinctions between wild plants and European plants?

Wild plant harvesting

- Which wild plants do you harvest? Why do you harvest these species in particular?
- Do you do anything to encourage the growth of wild plants (E.g. weeding, burning, pruning, watering, transplanting, tilling, fertilizing, etc.)?
- Do you notice if some plants grow better/worse with disturbance (e.g. near trails, around buildings, with upturned soil, after a fire)?
- Which tools do you use when you harvest wild plants?
- How do you prepare/store wild plants?
- Do you see any changes in the landscape as a result of the way you harvest plants?
- Do you harvest any plants from the sea (e.g. seaweed, kelp)?
- Do you share plants that you harvest?

Gardening

- Do you grow a garden? In town or at your cabin?
- What grows in your garden?
- Do you work in your garden? What kind of management does your garden need?
- Where did the plants in your garden come from?
- Are any of the plants in your garden transplanted from somewhere else?
- Do certain plants in your garden grow better when grown together?
- Do you use fertilizer in your garden? What kind?
- Do you do anything to the soils in your garden?
- Where does your gardening knowledge come from?
- Where did you learn to garden?
- How long have people been gardening in Makkovik? What contributed to these gardening traditions?
- Why do you grow a garden?
- Do you store foods from your garden?
- How important is your garden to your diet?
- Do you share plants from your garden?

Changes to relationships with plants

- Have your relationships with plants changed over the years? Why/why not?
- Can you describe any changes in your harvesting/storing/management of plants? What accounts for these changes?
- Do you remember any plants that you used to harvest that you no longer harvest?
- Are there any plants that you remember your neighbours harvesting in the past?
- Are plants as important to your life today as they were in the past?
- Are some plants more important, and others less important?
- Do you notice changes in the plant knowledge in your family, community? Can you suggest some reasons for why this knowledge may have changed?
- Are you concerned about changes in plant knowledge?
- Are there some contemporary practices regarding plants that you think should be changed?

Appendix V Thematic groupings

1. Family places

(withheld – community archives only)

2. Family names

(withheld – community archives only)

3a. Plants: Genus, species; local names (English)

<i>Abies balsamea</i>	Pinaceae	vir, fir
<i>Allium schoenoprasum</i>	Liliaceae	chives
<i>Alnus viridis</i>	Betulaceae	alder, willows
<i>Amelanchier bartramiana</i>	Rosaceae	Indian plum, plum willow, plum tree
<i>Angelica atropurpurea</i>	Apiaceae	hemlock, poison hemlock, umbellock
<i>Arctous alpina</i>	Ericaceae	foxberry
<i>Arnica</i> sp.	Asteraceae	arnica
<i>Astragalus alpinus</i>	Fabaceae	Jacob's ladder
<i>Betula papyrifera</i>	Betulaceae	birch
<i>Boletus</i> spp. (and other genera)	Boletaceae	mushroom
<i>Calamagrostis canadensis</i> ; also other grasses	Poaceae	grass, Labrador grass
<i>Campanula uniflora</i>	Campanulaceae	bluebells
<i>Chamerion angustifolium</i>	Onagraceae	bumblebee flower
<i>Cladonia</i> spp.	Cladoniaceae	moss, caribou moss
<i>Comarum palustre</i>	Rosaceae	Labrador rose
<i>Cornus suecica</i> , <i>C. canadensis</i>	Cornaceae	crackerberry
<i>Delphinium</i> sp.	Ranunculaceae	larkspurs, delphinium
<i>Empetrum nigrum</i>	Ericaceae	blackberry
<i>Dicranum</i> spp.; <i>Polytrichum</i> spp.; <i>Racomitrium</i> spp.; <i>Sphagnum</i> spp.	Dicranaceae; Polytrichaceae; Grimmiaceae; Sphagnaceae	moss, green moss
<i>Eriophorum</i> spp.	Cyperaceae	cotton grass, Arctic cotton, cotton balls
<i>Gaultheria hispidula</i>	Ericaceae	snowberry, menya berry
<i>Geocaulon lividum</i>	Santalaceae	deadly nightshade
<i>Iris setosa</i>	Iridaceae	iris
<i>Juniperus communis</i>	Cupressaceae	juniper, ground juniper
<i>Kalmia polifolia</i>	Ericaceae	
<i>Larix laricina</i>	Pinaceae	juniper, juniper tree

<i>Laminaria</i> spp.; <i>Dictyosiphon</i> spp.; <i>Ascophyllum nodosum</i> ; <i>Fucus</i> spp.; <i>Fucus edentatus</i> ; <i>Fucus</i> <i>vesiculosus</i> ; <i>Pilayella</i> spp.	Laminariaceae; Chordariaceae; Fucaceae; Acinetosporaceae	kellup, seaweed
<i>Lathyrus japonicus</i>	Fabaceae	beach peas, saltwater peas, green peas, wild peas, sweet peas, peas
<i>Leymus mollis</i>	Poaceae	grass, saltwater grass
<i>Ligusticum scoticum</i>	Apiaceae	Alexanders
<i>Linnaea borealis</i>	Caprifoliaceae	twinflor, twin-bell flower
<i>Lupinus polyphyllus</i>	Fabaceae	lupines
<i>Matricaria chamomilla</i>	Asteraceae	chamomile
<i>Mentha arvensis</i>	Lamiaceae	mint, mints
<i>Menyanthes trifoliata</i>	Menyanthaceae	lilies, water lilies, lilypads
<i>Moneses uniflora</i>	Ericaceae	one-flowered wintergreen
<i>Oclemena nemoralis</i>	Asteraceae	bog aster, aster
<i>Oxyria digyna</i>	Polygonaceae	tiny rhubarbs
<i>Papaver nudicaule</i> ; <i>Papaver</i> <i>labradoricum</i>	Papaveraceae	poppy, poppies
<i>Pedicularis groenlandica</i>	Orobanchaceae	elephant's head
<i>Pedicularis labradorica</i> (?); <i>Pedicularis flammea</i> (?); <i>Oxytropis</i> <i>campestris</i> (?); <i>Bistorta vivipara</i> (?)	Orobanchaceae; Orobanchaceae Fabaceae; Polygonaceae	Eskimo potato, Inuit potato, bear root
<i>Picea glauca</i>	Pinaceae	blue spruce
<i>Picea glauca</i>	Pinaceae	white spruce, spruce
<i>Picea mariana</i>	Pinaceae	black spruce, spruce
<i>Pinus banksiana</i>	Pinaceae	jack pine
<i>Populus tremuloides</i>	Salicaceae	poplar, popular
<i>Potentilla anserina</i>	Rosaceae	buttercup
<i>Ranunculus</i> sp.	Ranunculaceae	buttercup
<i>Rheum</i> spp.	Polygonaceae	rhubarbs, rhubarb
<i>Rhodiola rosea</i>	Crassulaceae	tulligunnak (many pronunciations: e.g. who- le-vee-nuk)
<i>Rhododendron groenlandicum</i>	Ericaceae	Indian tea, Labrador tea
<i>Ribes glandulosum</i>	Grossulariaceae	currants
<i>Rubus arcticus</i>	Rosaceae	strawberries
<i>Rubus chamaemorus</i>	Rosaceae	bakeapple, appik
<i>Rubus idaeus</i>	Rosaceae	raspberry
<i>Rubus pubescens</i>	Rosaceae	hairy plumboy
<i>Rumex crispus</i>	Polygonaceae	German rhubarbs

<i>Salix</i> spp.	Salicaceae	willows, uKaujak (just the early leaves); pussy willow; dogberry willow (tall willows with a gall)
<i>Senecio pseudoarnica</i>	Asteraceae	saltwater flowers, saltwater sunflowers
<i>Sorbus decora</i>	Rosaceae	dogberry, dogberry tree
<i>Streptopus amplexifolius</i>	Liliaceae	twisted stalk
<i>Tagetes</i> spp.	Asteraceae	marigold
<i>Taraxacum</i> spp.	Asteraceae	dandelion, piss-a-beds
<i>Vaccinium boreale</i>	Ericaceae	groundharts, blueberries
<i>Vaccinium caespitosum</i>	Ericaceae	blueberries
<i>Vaccinium oxycoccos</i>	Ericaceae	marshberry
<i>Vaccinium uliginosum</i>	Ericaceae	backieberries, blueberries
<i>Vaccinium vitis-idaea</i>	Ericaceae	redberries
<i>Viburnum edule</i>	Adoxaceae	squashberry

3b. Groups of plants

Wood, drift
Wood, rotten
1-Berries
2-Trees
3-Ferns
Houseplants
Other

4. Plants in relationship and practice

Habitat
Food plants
Medicine plants
Materials plants
Aesthetic plants
Meaningful plants and places, memory
Transplants
Gardens and cultivated plants
Storing plants
Berries
Wooding and wood
Fishing and plants
Hunting and plants
Plants and other plants
Weather and seasons
Traveling and plants
Survival, emergency
Naming and language
Celebrating, special occasions
Warnings about plants
Playing
Creating, art and plants
Manse, Moravians
Hearing the voices of plants, roles of plants
Showing respect for plants
Management actions / caring for plants
Sharing plants
Connecting community, family and plants
Teaching, learning and plants
Importance of outdoors and plants
Stories about plants
Changes and challenges to plants and harvesting

Appendix W Map - Tom's Cove (TOC) plots

Appendix X Map – Ikey's Point (IKP) plots

Appendix Y Map - October Harbour (OCH) plots

Appendix Z Map – West Turnavik (WTU) plots

Appendix AA Map – East Turnavik (ETU), East Turnavik C (ETC) and East Turnavik N (ETN) plots

Appendix BB Map – Ironbounds (IRO) plots

Appendix CC Map – Malona Point (MPT) plots

Appendix DD Map – Tupik Point (TPT) and Tupik Point South (TPS) plots

Appendix EE Map – East Turnavik Point (ETP) plots

Appendix FF Map – Long Tickle (ADL) plots

Appendix GG Map – Seal Cove (SEC) plots

Appendix HH Map – Big Bight (BBT) plots

Appendix II Map – Indian Head (INH) and Top Garden (TOG) plots

Appendix JJ Plot type distribution at sites

Site	Undisturbed plots													Built environment plots							Total plots at site	
	Bog	Conifer	Grass	Heath	Inland rock	Low herbaceous	Low shrub	Pond	Shoreline cobble	Shoreline grass	Shoreline rock	Tall herb	Tall shrub	Garden	Midden heap	Sod house	Stage	Tent ring	Tent site	Unknown str.		Wood house
Category 1 – family places																						
Tom’s Cove		1	1	1	1							1	1								1	7
Ikey’s Point						1	1		1	1	1	1	1								2	9
October Harbour						1			1										1		2	5
Category 2 – large commercial																						
West Turnavik			1		1	1	1							1	1		1			1	1	9
East Turnavik	1		1	1	1		1	1			1				1	1					2	11
Ironbounds				1	1							1							1		2	6
Category 3 – mixed harvesting																						
Malona Point				1	1			1										1				4
Tupik Point				1	1	1	1											2				6
East Turnavik Point				1	1	1				1								2				6
Supplemental																						
Long Tickle															1	2				1		4
Tupik Point S																				1		1
Seal Cove														1						1	1	3
Big Bight														1								1
East Turnavik C																1						1
East Turnavik N														1							1	2
Indian Head																	1					1
Top Garden														1								1
Total plots of this plot type	1	1	3	6	7	5	4	2	2	2	2	3	2	5	3	4	2	5	2	4	12	77

Appendix KK Plot type, plot abbreviation, and plot area (m²)

Plot	Plot type	Abbrev	Plot area (m ²)
ETU-BOGG	Bog	BOGG	27
TOC-CONI	Conifer	CONI	269
WTU-GARD	Garden	GARD	27
ETN-GARD	Garden	GARD	32
SEC-GARD	Garden	GARD	45
BBT-GARD	Garden	GARD	51
TOG-GARD	Garden	GARD	51
TOC-GRAS	Grass	GRAS	40
WTU-GRAS	Grass	GRAS	484
ETU-GRAS	Grass	GRAS	13
TOC-HEAT	Heath	HEAT	376
IRO-HEAT	Heath	HEAT	966
ETU-HEAT	Heath	HEAT	538
ETP-HEAT	Heath	HEAT	29
MPT-HEAT	Heath	HEAT	726
TPT-HEAT	Heath	HEAT	766
TOC-INRO	Inland rock	INRO	336
IRO-INRO	Inland rock	INRO	272
WTU-INRO	Inland rock	INRO	54
ETU-INRO	Inland rock	INRO	269
ETP-INRO	Inland rock	INRO	728
MPT-INRO	Inland rock	INRO	538
TPT-INRO	Inland rock	INRO	363
OCH-LOHE	Low herb	LOHE	69
IKP-LOHE	Low herb	LOHE	46
WTU-LOHE	Low herb	LOHE	134
ETP-LOHE	Low herb	LOHE	626
TPT-LOHE	Low herb	LOHE	134
IKP-LOSH	Low shrub	LOSH	46
WTU-LOSH	Low shrub	LOSH	484
ETU-LOSH	Low shrub	LOSH	94
TPT-LOSH	Low shrub	LOSH	40
WTU-MIHE	Midden	MIHE	27
ETU-MIHE	Midden	MIHE	40
ADL-MIHE	Midden	MIHE	16
ETU-POND	Pond	POND	40
MPT-POND	Pond	POND	67
OCH-SHCO	Shoreline cobble	SHCO	995

Plot	Plot type	Abbrev	Plot area (m ²)
IKP-SHCO	Shoreline cobble	SHCO	152
IKP-SHGR	Shoreline grass	SHGR	685
ETP-SHGR	Shoreline grass	SHGR	44
IKP-SHRO	Shoreline rock	SHRO	152
ETU-SHRO	Shoreline rock	SHRO	161
ETU-SOHO	Sod house	SOHO	27
ADL-SOH1	Sod house	SOHO	24
ADL-SOH2	Sod house	SOHO	64
ETC-SOHO	Sod house	SOHO	31
WTU-STAG	Stage	STAG	27
INH-STAG	Stage	STAG	121
TOC-TAHE	Tall herb	TAHE	269
IKP-TAHE	Tall herb	TAHE	289
IRO-TAHE	Tall herb	TAHE	68
TOC-TASH	Tall shrub	TASH	27
OCH-TASH	Tall shrub	TASH	276
ETP-TER1	Tent ring	TERI	15
ETP-TER2	Tent ring	TERI	15
MPT-TERI	Tent ring	TERI	13
TPT-TER1	Tent ring	TERI	27
TPT-TER2	Tent ring	TERI	13
OCH-TESI	Tent site	TESI	14
IRO-TESI	Tent site	TESI	14
WTU-UNKN	Unknown structure	UNST	13
ADL-UNKN	Unknown structure	UNST	63
TPS-UNST	Unknown structure	UNST	27
SEC-UNST	Unknown structure	UNST	36
OCH-WOH2	Wood house	WOHO	14
IKP-WOH2	Wood house	WOHO	76
OCH-WOH3	Wood house	WHOO	14
TOC-WOHO	Wood house	WOHO	27
IKP-WOHO	Wood house	WOHO	76
IRO-WOH1	Wood house	WOHO	27
IRO-WOH3	Wood house	WOHO	14
WTU-WOHO	Wood house	WOHO	94
ETU-WOH1	Wood house	WOHO	108
ETU-WOH2	Wood house	WOHO	27
ETN-WOHO	Wood house	WOHO	63
SEC-WOHO	Wood house	WOHO	36

Appendix LL Waypoints for all plots

Plot	Lat	Long
TOC-WOHO	55.1228963	-59.185505
TOC-TASH	55.1227862	-59.1855053
TOC-TAHE	55.1228255	-59.1854804
TOC-INRO	55.122826	-59.185121
TOC-HEAT	55.1226566	-59.1849141
TOC-GRAS	55.1226504	-59.1850751
TOC-CONI	55.1228199	-59.1847898
OCH-TESI	55.0993076	-58.9652789
OCH-SHCO	55.0996477	-58.9653986
OCH-LOHE	55.0993788	-58.9652982
OCH-TASH	55.0998477	-58.9651923
OCH-WOH2	55.099805	-58.9654386
OCH-WOH3	55.0999815	-58.9648927
IKP-WOHO	55.1492894	-59.1434676
IKP-WOH2	55.1493492	-59.1434256
IKP-SHGR	55.1494341	-59.1436274
IKP-LOHE	55.1494488	-59.143644
IKP-TAHE	55.149427	-59.1437634
IKP-LOSH	55.1494824	-59.1437629
IKP-SHRO	55.1489962	-59.143631
IKP-SHCO	55.1492425	-59.1437589
IRO-TAHE	55.1459252	-58.7803962
IRO-WOH1	55.1455444	-58.780519
IRO-WOH3	55.146149	-58.7803304
IRO-TESI	55.1455789	-58.7805227
IRO-HEAT	55.1459781	-58.7806281
IRO-INRO	55.1458473	-58.7806172
WTU-STAG	55.2516607	-59.3365133
WTU-GRAS	55.2516971	-59.335445
WTU-LOHE	55.2517428	-59.3363892
WTU-MIHE	55.2516293	-59.3352542
WTU-GARD	55.2515286	-59.3353332
WTU-LOSH	55.2514377	-59.3354441
WTU-WOHO	55.2517022	-59.3352404
WTU-UNST	55.2513808	-59.335369
WTU-INRO	55.2518364	-59.3364283
ETU-MIHE	55.2861608	-59.3406631
ETU-WOH1	55.2861212	-59.3403411
ETU-WOH2	55.2859125	-59.3407598

Plot	Lat	Long
ETU-SOHO	55.2861375	-59.3404763
ETU-HEAT	55.2858542	-59.3406401
ETU-GRAS	55.2858984	-59.3408498
ETU-LOSH	55.2859923	-59.3408871
ETU-POND	55.2859028	-59.3404362
ETU-BOGG	55.2860305	-59.3405359
ETU-INRO	55.2860005	-59.3406365
ETU-SHRO	55.2860946	-59.3410184
ETP-HEAT	55.2782674	-59.3319127
ETP-LOHE	55.278331	-59.3322596
ETP-TER1	55.2781128	-59.3318582
ETP-TER2	55.2781143	-59.3317987
ETP-SHGR	55.2782017	-59.3326372
ETP-INRO	55.2781204	-59.3320932
MPT-TER1	54.9996671	-58.8695861
MPT-HEAT	54.999641	-58.8691779
MPT-INRO	54.9995821	-58.8692847
MPT-POND	54.9995434	-58.8689271
TPT-HEAT	54.9676572	-58.8568657
TPT-LOSH	54.9676961	-58.8568281
TPT-LOHE	54.9674819	-58.8570218
TPT-TER1	54.9679106	-58.8566325
TPT-TER2	54.9679099	-58.8565314
TPT-INRO	54.9676879	-58.8567187
ADL-SOH1	55.0232738	-58.8189279
ADL-SOH2	55.0237763	-58.8186077
ADL-MIHE	55.0233084	-58.8190864
ADL-UNST	55.0230556	-58.8192243
TPS-UNST	54.9674578	-58.857165
ETC-SOHO	55.2875402	-59.3411478
ETN-WOHO	55.2871345	-59.343746
ETN-GARD	55.2871675	-59.3439577
SEC-WOHO	54.8492394	-58.8074331
SEC-GARD	54.8493034	-58.8073621
SEC-UNST	54.8492712	-58.8072657
BBT-GARD	54.993169	-59.0287115
INH-STAG	55.0926036	-59.1726784
TOG-GARD	55.0893118	-59.1787738

Appendix MM Substrate classes

Substrate type	Substrate code	Substrate no.
leaf litter	ll	1
grass thatch	gt	2
lichen	lichen	3
moss	moss	4
Sphagnum	sphagnum	5
rock	rock	6
cobbles	cobbles	7
gravel	gravel	8
fine clay	fineclay	9
mussel shells	mussels	10
organic muck	muck	11
coarse woody debris	cwd	12

Appendix NN Details of statistical analyses

We conducted a Principal Components Analysis (PCA) on Hellinger's transformed species abundance data to look at multivariate relationships in plant community composition (Porter et al. 2015). A PCA was also run on transformed select environmental variables to examine the effects of environmental variables on relationships between plots. We used Redundancy Analysis (RDA) to assess relationships between plant community composition and transformed environmental variables (Porter et al. 2015). Plots with missing environmental variables were removed from the RDA (e.g. rocky plots without soil data). As in the PCA, we used a Hellinger transformation on the species abundance data. All analyses were performed using the open source software R, version 2.15.0 (R Core Team 2013), and the package "vegan".

Appendix OO Transformations used on environmental variables for Principal Components Analysis (PCA) and Redundancy Analysis (RDA)

Variable	Transformation
Al	logarithm
B	square root
Ca	logarithm
Cu	logarithm
Fe	logarithm
K ₂ O	logarithm
Mg	logarithm
Na	logarithm
Organic matter	logarithm
P ₂ O ₅	logarithm
S	logarithm
Mn	logarithm
Zn	square root
Elevation	logarithm
Vegetation height	square root
Soil depth	square root
pH	no transformation
Topography class	no transformation
Drainage class	no transformation
CEC	no transformation

Appendix PP R code for three statistical analyses

1. Principal Components Analysis (PCA) – species only; 2. Principal Components Analysis (PCA) – environmental variables only; 3. Redundancy Analysis (RDA)

1. Principal Components Analysis (PCA) – species only

```
library(ade4)
library(vegan)
library(packfor)
library(MASS)
library(ellipse)
library(FactoMineR)

e1 <- read.table("plotdata.txt", header = T, sep= "\t")

e1.veg<- e1[,42:165]

e1.veg2 <- e1.veg[rowSums(e1.veg) >0]

e1.hel <- decostand(e1.veg2, method = "hellinger")

e1.hel.pca <- rda(e1.hel)

plot(e1.hel.pca)

summary(e1.hel.pca, scaling = 2)

sr <- scores(e1.hel.pca, display = c("sites", "species"), choices = c(1,2,3,4,5,6), scaling =
2)

sr$sites

srsp <- as.data.frame(sr$species)

e1.site <- e1[,1:3]

e1.eo <- merge(e1.site, sr$sites, by=0, sort=FALSE)
```


2. Principal Components Analysis (PCA) – environmental variables only

```
library(ade4)
library(vegan)
library(packfor)
library(MASS)
library(ellipse)
library(FactoMineR)

e1 <- read.table("plotdata.txt", header = T, sep= "\t")

options(StringsAsFactors=F)

e1 <- read.table("plotdata.txt", as.is=T,header = T, sep= "\t")

e1$Unit<-as.numeric(e1$Unit)
e1$site.sqm<-as.numeric(e1$site.sqm)
e1$plot.percarea<-as.numeric(e1$plot.percarea)
e1$pen.avg<-as.numeric(e1$pen.avg)
e1$pH<-as.numeric(e1$pH)
e1$pH.buff<-as.numeric(e1$pH.buff)
e1$org.matt<-as.numeric(e1$org.matt)
e1$P2O5<-as.numeric(e1$P2O5)
e1$K2O<-as.numeric(e1$K2O)
e1$Ca<-as.numeric(e1$Ca)
e1$Mg<-as.numeric(e1$Mg)
e1$Na<-as.numeric(e1$Na)
e1$S<-as.numeric(e1$S)
e1$Al<-as.numeric(e1$Al)
e1$B<-as.numeric(e1$B)
e1$Cu<-as.numeric(e1$Cu)
e1$Fe<-as.numeric(e1$Fe)
e1$Mn<-as.numeric(e1$Mn)
e1$Zn<-as.numeric(e1$Zn)
e1$CEC<-as.numeric(e1$CEC)
e1$K.basesat<-as.numeric(e1$K.basesat)
e1$Ca.basesat<-as.numeric(e1$Ca.basesat)
e1$Mg.basesat<-as.numeric(e1$Mg.basesat)
e1$Na.basesat<-as.numeric(e1$Na.basesat)
e1$H.basesat<-as.numeric(e1$H.basesat)
e1$CaCO3<-as.numeric(e1$CaCO3)

e1$tAl<-log(e1$Al)
e1$tB<-sqrt(e1$B)
e1$tCa<-log(e1$Ca)
e1$tCu<-log(e1$Cu)
```

```

e1$tFe<-log(e1$Fe)
e1$tK2O<-log(e1$K2O)
e1$tMg<-log(e1$Mg)
e1$tNa<-log(e1$Na)
e1$torg.matt<-log(e1$org.matt)
e1$tP2O5<-log(e1$P2O5)
e1$tS<-log(e1$S)
e1$tMn<-log(e1$Mn)
e1$tZn <-sqrt(e1$Zn)
e1$elev.avg<-log(e1$elev.avg+30)
e1$tvegH.avg<-sqrt(e1$vegH.avg+1)
e1$tsoilD.avg<-sqrt(e1$soilD.avg+1)

env.only<-
e1[c(1:3,5:7,11:12,14:19,22:26,28:35,37:43,48:49,54:55,58:62,64:77),c(15:17,19,34,166:
181)]

env.onlyPCA<-rda(env.only)

env.onlyPCA<-prcomp(env.only,scale.=T)

plot.scores <- as.data.frame(predict(env.onlyPCA))

e2<-read.table("plotdata.txt",header=T,sep="\t")

id <- e2[c(1:3,5:7,11:12,14:19,22:26,28:35,37:43,48:49,54:55,58:62,64:77),c(1:3,7)]

e3 <- merge (id,plot.scores, by=0, sort=FALSE)

```

3. Redundancy Analysis (RDA)

```
library(ade4)
library(vegan)
library(packfor)
library(MASS)
library(ellipse)
library(FactoMineR)

e1 <- read.table("plotdata.txt", header = T, sep= "\t")

options(StringsAsFactors=F)

e1 <- read.table("plotdata.txt", as.is=T,header = T, sep= "\t")

e1$Unit<-as.numeric(e1$Unit)
e1$site.sqm<-as.numeric(e1$site.sqm)
e1$plot.percarea<-as.numeric(e1$plot.percarea)
e1$pen.avg<-as.numeric(e1$pen.avg)
e1$pH<-as.numeric(e1$pH)
e1$pH.buff<-as.numeric(e1$pH.buff)
e1$org.matt<-as.numeric(e1$org.matt)
e1$P2O5<-as.numeric(e1$P2O5)
e1$K2O<-as.numeric(e1$K2O)
e1$Ca<-as.numeric(e1$Ca)
e1$Mg<-as.numeric(e1$Mg)
e1$Na<-as.numeric(e1$Na)
e1$S<-as.numeric(e1$S)
e1$Al<-as.numeric(e1$Al)
e1$B<-as.numeric(e1$B)
e1$Cu<-as.numeric(e1$Cu)
e1$Fe<-as.numeric(e1$Fe)
e1$Mn<-as.numeric(e1$Mn)
e1$Zn<-as.numeric(e1$Zn)
e1$CEC<-as.numeric(e1$CEC)
e1$K.basesat<-as.numeric(e1$K.basesat)
e1$Ca.basesat<-as.numeric(e1$Ca.basesat)
e1$Mg.basesat<-as.numeric(e1$Mg.basesat)
e1$Na.basesat<-as.numeric(e1$Na.basesat)
e1$H.basesat<-as.numeric(e1$H.basesat)
e1$CaCO3<-as.numeric(e1$CaCO3)

Transformation of env variables
e1$tAl<-log(e1$Al)
e1$tB<-sqrt(e1$B)
e1$tCa<-log(e1$Ca)
```

```

e1$tCu<-log(e1$Cu)
e1$tFe<-log(e1$Fe)
e1$tK2O<-log(e1$K2O)
e1$tMg<-log(e1$Mg)
e1$tNa<-log(e1$Na)
e1$torg.matt<-log(e1$org.matt)
e1$tP2O5<-log(e1$P2O5)
e1$tS<-log(e1$S)
e1$tMn<-log(e1$Mn)
e1$tZn <-sqrt(e1$Zn)
e1$telev.avg<-log(e1$elev.avg+30)
e1$tvegH.avg<-sqrt(e1$vegH.avg+1)
e1$tsoilD.avg<-sqrt(e1$soilD.avg+1)

veg.only<-
e1[c(1:3,5:7,11:12,14:19,22:26,28:35,37:43,48:49,54:55,58:62,64:77),c(42:165)]

veg.only2 <- veg.only[rowSums(veg.only) >0,] ## no empty rows

veg.hel <- decostand(veg.only2, method = "hellinger")

env.only<-
e1[c(1:3,5:7,11:12,14:19,22:26,28:35,37:43,48:49,54:55,58:62,64:77),c(15:17,19,34,166:
181)]

venv.rda <- rda(veg.hel ~ ., env.only)

```

Appendix QQ Eigenvalues for species-only PCA

	PC1	PC2	PC3	PC4	PC5	PC6
Eigenvalue	0.1548	0.0738	0.0623	0.0425	0.0380	0.0337
Proportion explained	0.2185	0.1041	0.0879	0.0599	0.0537	0.0476
Cumulative proportion	0.2185	0.3227	0.4106	0.4705	0.5242	0.5718

Appendix RR Eigenvalues for environmental variables-only PCA

	PC1	PC2	PC3	PC4	PC5	PC6
Eigenvalue	70.5523	12.1722	11.7128	5.3963	1.6563	1.4624
Proportion explained	0.6632	0.1144	0.1101	0.0507	0.0156	0.0138
Cumulative proportion	0.6632	0.7776	0.8877	0.9384	0.9540	0.9677

Appendix SS Eigenvalues for RDA

	RDA1	RDA2	RDA3	RDA4	RDA5	RDA6
Eigenvalue	0.1254	0.0605	0.0459	0.0276	0.0224	0.0203
Proportion Explained	0.1859	0.0897	0.0681	0.0409	0.0332	0.0301
Cumulative proportion	0.1859	0.2756	0.3437	0.3846	0.4178	0.4479

Variance explained = 0.28

Appendix TT Ten most common species found at each of the nine primary sites

CATEGORY 1 SITES					
Tom's Cove (TOC) (7 plots)		October Harbour (OCH) (6 plots)		Ikey's Point (IKP) (8 plots)	
Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site
<i>Empetrum nigrum</i>	7	<i>Angelica atropurpurea</i>	6	<i>Chamerion angustifolium</i>	8
<i>Trientalis borealis</i>	7	<i>Chamerion angustifolium</i>	6	<i>Leymus mollis</i>	7
<i>Vaccinium vitis-idaea</i>	7	<i>Lathyrus japonicus</i>	5	<i>Ligusticum scoticum</i>	6
<i>Abies balsamea</i>	6	<i>Viola sp.</i>	5	<i>Rubus arcticus</i>	6
<i>Chamerion angustifolium</i>	6	<i>Poa glauca</i>	5	<i>Stellaria borealis</i>	6
<i>Juniperus communis</i>	6	<i>Solidago macrophylla</i>	4	<i>Calamagrostis canadensis</i>	6
<i>Ribes glandulosum</i>	6	<i>Calamagrostis canadensis</i>	4	<i>Angelica atropurpurea</i>	4
<i>Dryopteris expansa</i>	6	<i>Arabis alpina</i>	3	<i>Salix glauca</i>	3
<i>Cornus suecica</i>	5	<i>Ranunculus abortivus</i>	3	<i>Solidago macrophylla</i>	3
<i>Picea glauca</i>	5	<i>Ribes glandulosum</i>	3	<i>Cerastium alpinum</i>	2

CATEGORY 2 SITES					
West Turnavik (WTU) (9 plots)		East Turnavik (ETU) (11 plots)		Ironbounds (IRO) (6 plots)	
Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site
<i>Rubus arcticus</i>	9	<i>Salix glauca</i>	9	<i>Chamerion angustifolium</i>	6
<i>Calamagrostis canadensis</i>	9	<i>Chamerion angustifolium</i>	8	<i>Empetrum nigrum</i>	6
<i>Chamerion angustifolium</i>	8	<i>Rubus arcticus</i>	8	<i>Salix glauca</i>	6
<i>Salix glauca</i>	8	<i>Calamagrostis canadensis</i>	8	<i>Vaccinium uliginosum</i>	6
<i>Stellaria longipes</i>	8	<i>Festuca rubra</i>	8	<i>Vaccinium vitis-idaea</i>	5
<i>Cornus suecica</i>	7	<i>Cornus suecica</i>	6	<i>Calamagrostis canadensis</i>	5
<i>Stellaria borealis</i>	7	<i>Empetrum nigrum</i>	6	<i>Carex brunnescens</i>	5
<i>Festuca rubra</i>	6	<i>Stellaria longipes</i>	6	<i>Cornus suecica</i>	4
<i>Vaccinium vitis-idaea</i>	5	<i>Vaccinium vitis-idaea</i>	6	<i>Rubus chamaemorus</i>	4
<i>Draba incana</i>	4	<i>Angelica atropurpurea</i>	5	<i>Solidago macrophylla</i>	4

CATEGORY 3 SITES					
Malona Point (MPT) (4 plots)		Tupik Point (TPT) (6 plots)		East Turnavik Point (ETP) (6 plots)	
Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site	Species	No. plots in which species occurs at site
<i>Empetrum nigrum</i>	4	<i>Empetrum nigrum</i>	6	<i>Empetrum nigrum</i>	5
<i>Rhododendron tomentosum</i>	3	<i>Vaccinium uliginosum</i>	6	<i>Rhodiola rosea</i>	5
<i>Sibbaldiopsis tridentata</i>	3	<i>Vaccinium vitis-idaea</i>	6	<i>Vaccinium uliginosum</i>	5
<i>Vaccinium uliginosum</i>	3	<i>Salix glauca</i>	5	<i>Ligusticum scoticum</i>	4
<i>Vaccinium vitis-idaea</i>	3	<i>Cornus suecica</i>	4	<i>Plantago maritima</i>	4
<i>Arctous alpina</i>	2	<i>Lathyrus japonicus</i>	4	<i>Lathyrus japonicus</i>	3
<i>Cornus suecica</i>	2	<i>Rhododendron tomentosum</i>	4	<i>Salix glauca</i>	3
<i>Kalmia polifolia</i>	2	<i>Rubus chamaemorus</i>	3	<i>Vaccinium vitis-idaea</i>	3
<i>Lathyrus japonicus</i>	2	<i>Arctous alpina</i>	2	<i>Leymus mollis</i>	3
<i>Pinguicula vulgaris</i>	2	<i>Betula glandulosa</i>	2	<i>Chamerion angustifolium</i>	2

Appendix UU Ranked site averages for soil nutrients and soil metals

Site	pH
TOC	4.16
MPT	4.23
SEC	4.40
TOG	4.71
TPT	4.75
IRO	4.82
BBT	4.84
INH	5.01
TPS	5.13
ETP	5.18
ETU	5.40
WTU	5.47
OCH	5.56
ADL	5.60
ETN	5.83
IKP	5.92
ETC	7.46

Site	Organic matter (%)
ETP	56.0
MPT	52.8
TPS	46.3
TPT	42.0
TOC	41.8
OCH	40.6
INH	39.9
IKP	37.6
IRO	37.1
ETU	36.8
ETN	29.7
WTU	25.1
ADL	19.1
ETC	7.4
SEC	4.7
TOG	4.6
BBT	4.4

Site	P ₂ O ₅ (kg/ha)
WTU	955
ETN	831
ETU	543
IKP	418
ETC	319
ADL	279
OCH	277
TOG	258
BBT	201
TPS	198
TOC	178
TPT	154
IRO	146
SEC	105
MPT	84
ETP	76
INH	58

Site	K ₂ O (kg/ha)
IKP	597
OCH	491
TPS	485
WTU	417
TPT	361
MPT	358
ADL	284
ETU	282
IRO	278
ETP	258
TOC	250
ETN	246
SEC	149
TOG	105
INH	95
BBT	90
ETC	68

Site	Ca (kg/ha)
ETC	11876
ETN	7483
IKP	6363
OCH	4975
WTU	4737
ETU	4041
ETP	3076
ADL	3016
TOC	2233
INH	1986
TPS	1521
TPT	1214
MPT	1196
IRO	623
BBT	592
SEC	445
TOG	307

Site	Mg (kg/ha)
IKP	1700
INH	1237
TPS	941
OCH	756
ETP	750
ETU	746
MPT	718
WTU	697
TPT	662
ADL	633
ETN	608
ETC	436
IRO	394
TOC	368
SEC	175
BBT	105
TOG	77

Site	Na (ka/ha)
INH	600
TPS	497
IKP	313
ETP	302
TPT	294
WTU	237
OCH	231
ETN	210
MPT	198
ETU	193
ADL	179
IRO	160
ETC	141
TOC	100
SEC	44
TOG	34
BBT	33

Site	S (ka/ha)
IKP	121
OCH	54
WTU	49
ETC	41
TOG	41
ETN	31
TPS	30
ETU	29
TPT	28
ADL	23
INH	23
MPT	22
TOC	21
IRO	17
ETP	15
SEC	14
BBT	8

Site	Al (ppm)
TOG	1197
OCH	940
WTU	502
TPT	314
IRO	276
ETC	271
TOC	265
MPT	261
SEC	261
BBT	204
ETN	200
ADL	198
ETU	168
INH	149
TPS	102
ETP	73
IKP	41

Site	B (ppm)
IKP	2.40
ETN	1.26
WTU	1.18
ETU	1.16
ETC	1.04
INH	0.94
ADL	0.87
ETP	0.83
TPS	0.83
TPT	0.62
OCH	0.60
MPT	0.54
IRO	0.5
TOC	0.49
SEC	0.49
BBT	0.49
TOG	0.49

Site	Cu (ppm)
BBT	34.56
ETC	7.71
WTU	7.26
ETN	5.29
OCH	4.45
TOC	4.16
IRO	3.98
TOG	3.76
ETU	2.81
SEC	2.12
INH	1.37
IKP	1.29
ADL	0.98
ETP	0.74
TPS	0.65
TPT	0.35
MPT	0.30

Site	Fe (ppm)
ETN	375
WTU	369
BBT	316
IRO	306
SEC	242
ETC	238
INH	221
ADL	197
TOC	196
TOG	190
ETU	186
TPS	181
IKP	179
OCH	147
TPT	116
MPT	97
ETP	64

Site	Mn (ppm)
BBT	62
TOC	47
SEC	45
TOG	35
WTU	26
ETU	24
ADL	23
ETN	23
ETC	22
IKP	21
OCH	21
INH	18
TPS	12
IRO	10
TPT	6
ETP	6
MPT	4

Site	Zn (ppm)
ETN	230.53
INH	128.00
WTU	99.28
IKP	75.13
TOC	74.74
ETU	65.61
ETC	29.90
IRO	23.84
SEC	21.97
BBT	20.85
ADL	11.95
TOG	11.85
OCH	11.16
TPS	9.59
TPT	8.81
ETP	7.43
MPT	5.13

Site	CEC (meq/100gm)
ETC	32.4
IKP	28.4
ETN	26.9
OCH	24.4
WTU	21.2
ETP	19.8
ETU	19.7
MPT	19.2
INH	18.9
TOC	18.0
TPS	16.4
ADL	16.1
TPT	14.1
IRO	13.4
SEC	5.7
TOG	5.7
BBT	4.5

Appendix VV Ranked plot type averages for soil nutrients and soil metals

Site	pH
Conifer	4.05
Heath	4.39
Tent ring	4.50
Tall shrub	4.60
Tall herb	4.73
Stage	4.74
Grass	4.75
Tent site	4.89
Garden	5.12
Unknown structure	5.15
Low herb	5.30
Low shrub	5.47
Wood house	5.55
Sod house	5.92
Midden heap	5.96
Shoreline grass	6.31

Site	Organic matter (%)
Heath	57.5
Conifer	56.1
Tall shrub	42.7
Shoreline grass	41.4
Low herb	40.7
Low shrub	39.2
Tall herb	34.7
Unknown structure	33.4
Stage	32.9
Tent site	32.6
Grass	29.8
Wood house	29.1
Tent ring	26.8
Midden heap	23.3
Sod house	19.0
Garden	12.3

Site	P ₂ O ₅ (kg/ha)
Midden heap	1267
Stage	580
Garden	555
Sod house	503
Grass	412
Low shrub	382
Unknown structure	373
Wood house	327
Low herb	321
Shoreline grass	292
Tall herb	260
Tall shrub	241
Tent ring	166
Tent site	109
Conifer	75
Heath	66

Site	K ₂ O (kg/ha)
Shoreline grass	660
Low shrub	543
Low herb	503
Unknown structure	393
Midden heap	371
Tall herb	370
Tall shrub	345
Grass	336
Tent ring	312
Wood house	298
Conifer	298
Heath	244
Tent site	227
Garden	204
Sod house	195
Stage	189

Site	Ca (kg/ha)
Midden heap	7740
Shoreline grass	6089
Sod house	5657
Wood house	4496
Grass	3797
Low herb	3388
Low shrub	3317
Tall shrub	3226
Garden	2864
Tall herb	2573
Stage	2303
Unknown structure	1791
Heath	1053
Tent ring	959
Conifer	583
Tent site	442

Site	Mg (kg/ha)
Shoreline grass	1634
Low shrub	1129
Low herb	1084
Stage	938
Midden heap	888
Wood house	740
Grass	737
Tall herb	609
Unknown structure	597
Tent ring	571
Sod house	567
Tall shrub	544
Heath	506
Conifer	333
Garden	330
Tent site	325

Site	Na (ka/ha)
Shoreline grass	518
Stage	417
Low herb	334
Low shrub	268
Tent ring	245
Unknown structure	242
Midden heap	231
Heath	198
Grass	179
Sod house	170
Wood house	170
Tent site	145
Tall herb	144
Tall shrub	135
Garden	128
Conifer	110

Site	S (ka/ha)
Low herb	109
Shoreline grass	56
Low shrub	53
Midden heap	42
Wood house	38
Tall herb	37
Unknown structure	35
Sod house	34
Tall shrub	31
Tent ring	30
Stage	30
Garden	29
Grass	27
Conifer	17
Tent site	17
Heath	14

Site	Al (ppm)
Tall shrub	801
Tent ring	576
Garden	570
Unknown structure	331
Tent site	307
Midden heap	301
Sod house	288
Wood house	246
Tall herb	234
Grass	216
Stage	195
Low shrub	193
Low herb	145
Heath	112
Shoreline grass	43
Conifer	41

Site	B (ppm)
Shoreline grass	2.81
Midden heap	2.11
Low herb	1.26
Wood house	1.24
Low shrub	1.09
Grass	0.97
Sod house	0.95
Garden	0.80
Unknown structure	0.75
Stage	0.73
Tall herb	0.58
Tent ring	0.52
Heath	0.50
Conifer	0.49
Tall shrub	0.49
Tent site	0.49

Site	Cu (ppm)
Garden	10.41
Midden heap	10.04
Tent site	6.26
Tall herb	6.04
Low shrub	4.21
Grass	3.88
Wood house	3.77
Sod house	2.95
Tall shrub	2.34
Unknown structure	2.00
Stage	1.15
Low herb	0.99
Shoreline grass	0.90
Heath	0.52
Tent ring	0.21
Conifer	0.15

Site	Fe (ppm)
Tent site	478
Stage	440
Wood house	282
Unknown structure	280
Garden	259
Tall herb	242
Sod house	210
Tall shrub	208
Midden heap	205
Low herb	192
Tent ring	179
Grass	175
Low shrub	171
Shoreline grass	120
Heath	82
Conifer	30

Site	Mn (ppm)
Garden	51
Tall shrub	49
Tall herb	48
Midden heap	42
Grass	35
Sod house	25
Unknown structure	23
Wood house	21
Stage	19
Tent site	13
Low shrub	11
Shoreline grass	11
Low herb	11
Conifer	8
Heath	4
Tent ring	4

Site	Zn (ppm)
Midden heap	133.42
Wood house	96.32
Garden	89.18
Grass	84.89
Stage	78.17
Shoreline grass	54.98
Tall herb	50.78
Low shrub	41.94
Sod house	36.58
Tall shrub	32.41
Tent site	24.65
Unknown structure	18.98
Low herb	17.23
Heath	7.50
Tent ring	5.79
Conifer	3.70

Site	CEC (meq/100gm)
Midden heap	28.3
Shoreline grass	26.8
Grass	21.9
Sod house	21.6
Tall shrub	20.8
Wood house	20.7
Low shrub	20.4
Low herb	20.1
Stage	18.8
Tall herb	18.1
Tent ring	15.1
Heath	14.4
Unknown structure	13.7
Garden	13.2
Tent site	12.0
Conifer	11.6

Appendix WW Author statements

STATEMENT OF CO-AUTHORSHIP AND PERMISSION

"As co-author of 'An Indigenous methodologies approach to understanding people-plant relationships in Makkovik' (Chapter 2), 'The stories people tell about plants – Makkovimiut plant knowledge in practice' (Chapter 3), and 'The stories plants tell about people – Ecological footprints of fishing practices near Makkovik' (Chapter 4), I, Gita Ljubicic, acknowledge Erica Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Gita Ljubicic, have contributed to the papers in this thesis as supervisor of Erica Oberndorfer during the doctoral program in geography. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis. These activities have been entirely consistent with the role of thesis supervisor."

Gita Ljubicic

March 8, 2016

Date

STATEMENT OF CO-AUTHORSHIP AND PERMISSION

“As co-author of ‘An Indigenous methodologies approach to understanding people-plant relationships in Makkovik’ (Chapter 2), and ‘The stories people tell about plants – Makkovimiut plant knowledge in practice’ (Chapter 3), I, Carol Gear, acknowledge Erica Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Carol Gear, have contributed to the papers in this thesis as the Makkovik Community Liaison Officer and as a Makkovimiut (resident of Makkovik) community research advisor. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis. These activities have been entirely consistent with the role of community research advisor.”

Carol Gear

March 8, 2016

Date

STATEMENT OF CO-AUTHORSHIP AND PERMISSION

“As co-author of ‘The stories people tell about plants – Makkovimiut plant knowledge in practice’ (Chapter 3), and ‘The stories plants tell about people – Ecological footprints of fishing practices near Makkovik’ (Chapter 4), I, Jeremy Lundholm, acknowledge Erica Oberndorfer as the lead contributing author of these manuscripts. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscripts.

I, Jeremy Lundholm, have contributed to the papers in this thesis as a member of Erica’s academic committee during the doctoral program in geography. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis, as well as providing code for statistical analyses and guiding analysis of ecological data. These activities have been entirely consistent with the role of thesis committee member.”

Jeremy Lundholm

March 7, 2016

Date

STATEMENT OF CO-AUTHORSHIP AND PERMISSION

“As co-author of ‘The stories plants tell about people – Ecological footprints of fishing practices near Makkovik’ (Chapter 4), I, Todd Broomfield, acknowledge Erica Oberndorfer as the lead contributing author of this manuscript. Erica designed and performed the research, obtained and analysed all data, and wrote and revised the manuscript.

I, Todd Broomfield, have contributed to the paper in this thesis as a Makkovimiut guide and research advisor. This has entailed discussion, advice, and editorial contributions to the design, field investigations, analysis, and writing of this thesis. These activities have been entirely consistent with the role of guide and research advisor.”

Todd Broomfield

March 7th 2016

Date