Feeding Our Spirit: Connecting Plants, Health, Place and Identity. Renewing Ethnobotanical Knowledge in the *Skwxwú7mesh* First Nation

By

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B.Sc., University of Victoria, 2010
M.Sc., University of Victoria 2012

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Abstract

In a time of Indigenous Resurgence, interrelationships with culturally important plants are key to the health and well-being of Canadian Indigenous Peoples. I work with my home community of *Sḵwx̱wú7mesh* (Squamish) First Nations in British Columbia. My research is conducted within the context of the Type 2 Diabetes (T2D) crisis in Indigenous communities across Canada. Type 2 Diabetes is five times higher than the general population and diagnosis is happening at younger ages. Drawing on theoretical and methodological approaches in ethnobotany, ethnobiology, and Indigenous Studies— and framing health and wellness from a *Sḵwx̱wú7mesh* perspective that considers physical, mental, emotional and spiritual health—I answer four interrelated questions: How might developing an indigenizing and decolonizing approach to ethnobotany move the field forward to the benefit of the communities we work with, and situate the discipline as a positive contributor to Indigenous cultural-political resurgence in Canada? How can culturally important plants help connect a person's sense of health (physical, spiritual, and emotional) to place? What do the connections between plants, health and place mean to the participants themselves? What role do culturally important plants play in developing approaches to addressing T2D from an Indigenous conceptualization of health viewpoint? These questions emerge from overarching themes and priorities that have *Sḵwx̱wú7mesh* expressed in initial discussions and consultation. The results of this study will inform the *Sḵwx̱wú7mesh* First Nations practices on culturally rooted approaches to health through rebuilding Indigenous plant relationships. The results of this work also provide a framework for other Indigenous communities interested in reconnecting with their traditional plant practices and addressing Type 2 Diabetes in a culturally relevant way.

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Acknowledgments

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Dedication

I dedicate my dissertation to my uncle and teacher, the late Ronald “Chum” Newman who taught me how to carry ancestral plant knowledge with respect, generosity and care for future generations.

Chapter 1: Introduction

I Am a Sḵwx̱wú7mesh Ethnobotanist

I wish to start with my own voice and ground the following work in my identity as a cis, able bodied Indigenous woman of mixed *Sḵwx̱wú7mesh* (Squamish) and European ancestry. It is important to me to situate myself and my knowledge in my personal history and identity as this is relevant to how I approach my research and writing. My ancestral name is *styawat*. I am a member of the *Sḵwx̱wú7mesh* (Squamish) First Nation on my father's side and of mixed English and Sephardic Jewish ancestry on my mothers. One of the most powerful ways I have found to connect to culture and contribute to community has been through my academic studies, and community-based research, in the field of ethnobotany. Finding a discipline that connects my own reconnection to ancestral knowledge with community-based research and resurgence has been very important in my life.

My path of studying ethnobotany has been shaped and affected by my experiences with intergenerational trauma along with my own path to cultural renewal and healing.

Culturally rooted plant practices have the power to heal relationships with the land and in turn relationships with ourselves as Indigenous Peoples. The depth of connection to place, to ancestors and to our own mindful presence is amplified when we partake in generations-old practices of plant cultivation and stewardship. In other words, when we uphold our ancestral relationships with our plant relatives that have always nourished our spirits and bodies as Indigenous Peoples.

I have been working with my community of *Sḵwx̱wú7mesh* over the past sixteen years on ethnobotany related projects and research. For the last five years I have been the Squamish Nation research coordinator for the "Pathways to Health Equity" team grant funded through the Canadian Institute for Health Research. This project set out to further the understanding of the role of medicinal plants in the prevention and management of Type 2 Diabetes. My work in *Sḵwx̱wú7mesh* was interconnected with this research project and my broader doctoral work focused on taking an ethnobotanical approach to facilitating increased access to plant foods and medicines within the context of Type 2 Diabetes.

Introduction

We are in a time of Indigenous Resurgence in Canada (Simpson, 2018). Increasingly, Indigenous Peoples are finding renewed strength, pride, and grounding through cultural practices. Included in this resurgence are the relationships between people and plants. This time of renewal comes on the back of generations of Indigenous Peoples who suffered unimaginable losses and trauma and who fought to pass on parts of their culture to future generations (Simpson, 1999, 2004, 2018; Turner et.al, 2008). As an Indigenous person and scholar, I find myself caught between the process of healing from my own experiences with intergenerational trauma and my drive to contribute my voice and perspectives to my chosen field of study, ethnobotany — the study of the interrelationships between plants and people. Plants connect Indigenous People to place in a very specific and meaningful way (Basso, 1996; Corntassel & Bryce, 2012; Cruikshank1990,

2007; Currier et al., 2015). A phrase commonly used within Indigenous communities "our food is our medicine" speaks to the intertwined nature of culturally important plants and health.

Prior to European contact Indigenous Peoples in Canada were inextricably connected to the land as it provided food, medicine, materials, shelter, and water but also cultural grounding for spirituality, language, and worldview (Deur & Turner, 2005; Garabaldi & Turner, 2004; Nazarea, 2006; Simpson, 2018; Turner, 2000,2005,2014). In recent years ethnobotanical and ethnobiological research has moved towards a collaborative method that views the Indigenous expert as teacher, colleague and co-contributor. However, research projects are still largely led by non-Indigenous researchers (Bannister, 2018; Gaudry, 2015; Senos et al., 2006; Turner, 2014).

The original definition of ethnobotany coined by John Harshberger in 1896, as "the study of the plant use by *primitive* peoples" demonstrates the direct colonial underpinnings of the genesis of this field. There is a growing awareness of the responsibility all researchers—Indigenous researchers included—to build trust with Indigenous Communities who feel they have been "researched to death" (De Leeuw et al., 2012). It is essential for ethnobotanists to move towards conducting research from a foundation that is grounded in Indigenous worldview and to follow the priorities/guidelines that a particular community identifies (Simpson, 2018; Bannister, 2018). To meet this objective, it is essential to have more trained Indigenous ethnobotanists and ethnobiologists. One of the guiding principles for my research is to develop ethnobotanical methods rooted in Indigenous Worldviews and Practices with the goal of having more trained Indigenous ethnobotanists. My priority is to promote the ongoing reconnection with our land, culture, and health through renewing plant-focused, land-based practices in the context of developing Indigenized frameworks for working with plants, renewing culturally grounded health and wellness practices, and addressing the T2D crisis through an ethnobotanical lens. The beauty and power of Indigenous connection to the land through plants is that it is rooted in context, story, specific locality, and connection to loved ones. This is a powerful place to start the conversation of health and wellness from.

Skwxwú7mesh People and Our Land

The traditional territory of the Skwxwú7mesh People (Figure 1) encompasses broad geographical and ecological diversity, including rugged mountain peaks, alpine ridges, deep river valleys, temperate rainforest, extensive wetlands, island archipelagos, and expanses of coastline. This dramatic landscape lends itself well to the many land-based stories that describe the origins and history of this rich territory. The territory spans from Kitsilano (Khahtsahlanogh), through West Vancouver to Squamish and further north, past the town of Pemberton. The Skwxwú7mesh People are part of the larger Coast Salish cultural and linguistic group (Suttles, 1990). Today Skwxwú7mesh people live in nine communities throughout their territory that encompassed 23 village sites in the past.

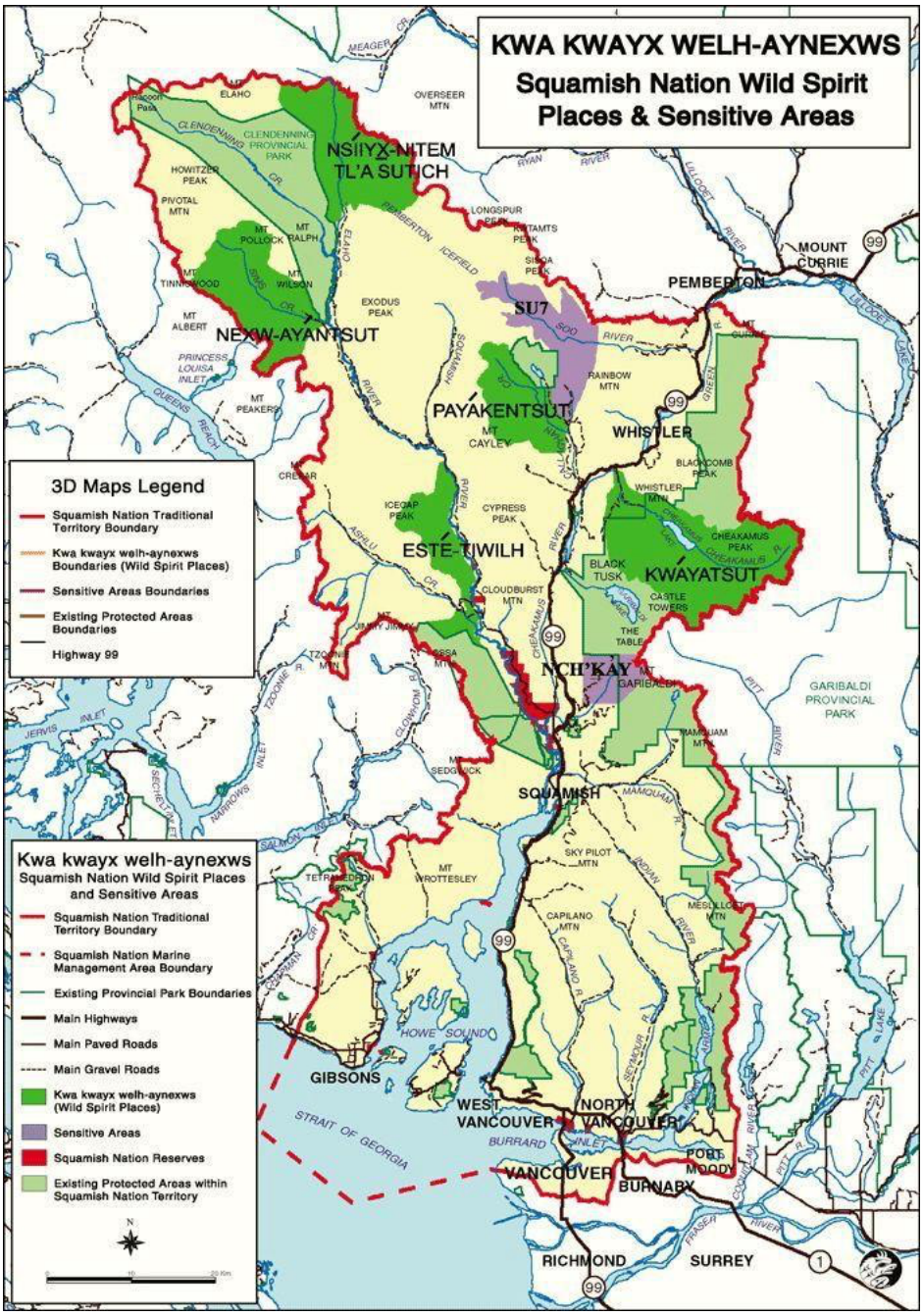

Figure 1: Squamish Traditional Territory Map. Accessed https://native-land.ca/maps/territories/skwxwu7mesh-uxwumixw/ [April 23,2022]

Six Guiding Principles

Principle 1: Our Food is Our Medicine

When we, as Indigenous Peoples, take traditional plant foods and medicines (and other traditional foods), into our bodies they strengthen us, prevent illness and connect us to place and ancestry in a meaningful way. The act of harvesting foods and medicines from the land involves

an in-depth knowledge of how to identify culturally important plant species, when to harvest certain plants, recognizing phenological indicators or seasonal indicators, developing or relearning sustainable management and harvesting practices guided by cultural worldview and practical lived knowledge accumulated over generations (Kimmerer, 2013; Simpson, 2018; Turner and Deur, 2005). A major strategy of colonization was to separate Indigenous people from the land and from the family members who could carry on land-based teachings (Kimmerer, 2013; Simpson, 2018; Talaga, 2018). In doing so the connections to foods, medicines, harvesting, knowledge of plant and animal life cycles and phenological indicators were severely damaged. The recovery of plant knowledge leads to the renewal of cultural relationships. Plants connect us to language, the land, stories, songs, and ceremony. The awareness of the interconnectedness between culturally important plants and culture guides me in my research. It helps me to relate with people in each Indigenous community that I work with and in turn it helps me to teach and share this knowledge in a culturally responsible way.

Principle 2: Connecting to Place Through Plants

When I teach about Indigenous Plants in community, I often start off by asking people to remember a time when plants first came into their lives or a time where a plant food, medicine or material was important to them. This often starts with the seed of a memory. A particular color, texture or smell that transports people to another time where they hold memories that they shared with family out on the land. Sometimes these memories are recent and sometimes it has been decades since the person has journeyed back to these memories. When it is possible to be out on the land with people during this activity, memories inevitably come back. Seeing the plant in the form of a photograph, a pressed plant, or by being out on the land looking at plants in their natural environment, helps to bring life and personal experience to the discussions connected to Indigenous Plants. The beauty of Indigenous connection to the land through plants is that it is a connection rooted in context, story, specific locality, and connection to loved ones. Beginning a discussion from this place of personal history and within the cultural context of a person immediately puts their context and priorities first. I do not come to community with a list of established questions that they must sit and answer. This approach would smother any chance of building the trust and ease rooted in one's personal history that is essential for delving into these memories and experiencing a lived sense of place.

I believe another layer of Indigenous Plant Knowledge and Practice is the memory that lives within the spirit and body that recalls the act of going out on the land to cultivate, harvest, transplant, burn, gather with family, and nourish oneself. I've felt this as I harvest and as I've developed my relationships with plant foods, medicines, and materials.

Developing a feeling of ease on the land takes time and experience but there is also a part of this that is a reckoning back to a time when ancestors travelled the same mountain passes, forests, estuaries, rivers and oceans. The presence of ancestors on the land facilitates the feeling of ease and of being at home in natural spaces.

Principle 3: Grounding Ethnobotanical Research in Respect and Reciprocity

Ethnobotanical and ethnobiological research with Indigenous Communities needs to be conducted in respectful, reciprocal and non-harmful ways. Research is an ongoing learning process of developing critical self-awareness and applying this to research processes. What this

looks like may differ from community to community, but it is important to recognize the responsibility to follow the priorities/guidelines that a particular community identifies in carrying out research and other scholarly activities (Simpson, 2018; Bannister, 2018). Recent theoretical approaches by Indigenous and non-Indigenous scholars working in related and complementary fields (Indigenous Studies, biology, ecological restoration, education, law) offer grounding for how current and future work in the field of ethnobotany can be rooted increasingly in a foundation of respect, reciprocity, and Indigenous Worldview (Gaudry, 2015; Manuel, 2017; Siisip Geniusz, 2015; Tuhawai Smith).

Principle 4: The Necessity for Indigenous Ethnobotanists

Grounding ethnobotany, ethnobiology, and related fields within Indigenous Worldview is accomplished by having Indigenous peoples conducting the research. There are many routes Indigenous Peoples can take to be part of ethnobotanical and ethnobiological renewal. Academia is one route. Academia is a path that can offer opportunities to step into the roles of researchers, policy makers and work within systems and institutions to create more Indigenous Representation and also pave the way for upcoming Indigenous scholars. For Indigenous Peoples inside and outside the academy, activism, community teachings and engagement, teaching one's children, and living, and learning from the land, are routes for Indigenous ethnobotanists to make contributions to their communities, and when shared more broadly, with the corpus of ethnobotany.

Principle 5: The Type 2 Diabetes Epidemic is a consequence of Colonialism

Over the past two centuries, Indigenous Peoples in North America have undergone significant changes in diet, medicinal plant use and overall way of life due largely to colonial impacts (Kimmerer, 2013; Simpson, 2018; Turner et al., 2008). Consequently, Indigenous Peoples are among the highest risk populations for developing Type 2 Diabetes (T2D) and related complications, with the prevalence being three to five times higher than for the general population in North America (Hegele, 2001). Colonialism was, and is, designed to undermine and erode Indigenous culture and identity and one of the direct impacts of this is a decline in the physical, emotional, and spiritual health of the people affected. Some of the particularly damaging colonial impacts in North America include, but are not limited to: residential schools; day schools; Indian hospitals; the 60's scoop; loss of access to traditional land base; the banning of cultural ceremonies; demonization of Indigenous languages; dehumanization by government policies; overt violence towards Indigenous Peoples—especially women; and the violent theft and privatization of land that prevents access to culturally important places (Coulthard, 2014; Gedes, 2017; Simpson, 2018). These acts of colonial injustice have caused deep trauma in North American Indigenous communities. Although Indigenous Peoples are strong, and there are many examples of cultural resurgence and healing taking place, there are still impacts from these traumas being felt deeply and affecting individual and community health in a myriad of ways (Geddes, 2017; Simpson, 2018; Turner et al., 2008). It is also important not to pigeonhole Indigenous Peoples as being the sum of their traumas. It is essential to learn and acknowledge the shared colonial history we have as North Americans and to examine how settler society has benefited from colonization. This includes academic institutions and the need to examine how they have been the beneficiaries of colonization. It is from an informed place that we can all look for creative and meaningful ways forward that honor Indigenous lives and history, but also create meaningful changes that uplift Indigenous Peoples and knowledge.

Principle 6: We All Have Blind Spots—The need for Reflexive Ethnobotanical Research

Reflexivity is the concept that Ethnobotanical research relies on a self-awareness of researcher biases and how they might influence the goals, methods, and outcomes of a study. Reflexivity is the process of continuous and collaborative practices to evaluate the subjectivity of the researchers and project—a self-conscious critique of appraising and evaluating their subjectivity and the context of the work that might influence the research process. The majority of ethnobotanical and ethnobiological work in Canada to date, however, has been conducted from a western European viewpoint and carried out by non-Indigenous researchers. Though there are many examples of meaningful collaborations with Indigenous Communities it is important to be mindful that there are inherent power differentials that exist between researchers and Indigenous Participants. This power differential is grounded in colonial constructs which western academic institutions are largely built on (De Leeuw *et.al*). Along with these power differentials there is a responsibility for ethnobotanists and ethnobiologists to ensure reflexivity in their work—that they are considering the impacts of their research on the lives and wellbeing of the people and communities they work with. An important starting place is to take a critical look at our own awareness and continued efforts to work in respectful and relevant ways in partnership with Indigenous communities. My paper "Walking on Our Lands Again: Turning to Culturally Important Plants and Indigenous Conceptualizations of Health in a Time of Cultural and Political Resurgence" (Joseph, 2021), includes a section on identifying our blind spots as researchers. In effect, I am offering a novel approach to reflexivity in ethnobotanical research. As researchers, if we are not applying an explicit reflexive, critical, anti-oppressive and antiracist lens, there is potential to be complicit in upholding bias, prejudice, and racism. Consequently, the following scenarios may occur when working with Indigenous Communities on ethnobotanical and ethnobiological research. Summarizing Joseph (2021), I offer the following risks of harm when researchers and projects do not work towards identifying subjectivities in ethnobotanical research:

1. You may assume that Indigenous People are not capable of understanding your research thus you don't conduct meaningful consultation or disseminate the findings.
2. You may not incorporate community interests or priorities in your research because they don't fit with your vision or what you think is best.
3. You may expect Indigenous People to be 'on your schedule' or jump when you say jump.
4. You may opt for judgment and condemnation of dysfunction in Indigenous Communities instead of working to understand the underlying impacts and issues that have led to such dysfunction.
5. You may end up interrupting or explaining for elders or community members who you assume don't know the answer if they don't speak or respond quickly enough.
6. You may end up only listening to one person and taking their word to represent their entire communities' perspectives.

These same principles also apply to our work as educators. In our classrooms, we need to consider how we create space for inclusivity and equality. The sentiment 'you only know what you know' applies to non-Indigenous professors, researchers, or teachers. Unless they've done extensive work to understand the role of racism within the institution in which they work or the

impacts on the people with which they conduct research, blind spots may exist when it comes to considering the role and impacts of racism, specifically anti-indigenous racism, in connection to the work they do.

Summary of Six Guiding Principles

Through my experiences as an Indigenous student pursuing the academic studies of ethnobotany and ethnobiology, I have found there is a great interest in learning about Indigenous knowledge of plants. This interest exists both within Indigenous Communities and beyond. Too often though there is a lack of recognition of the complexities that colonial history brings to the fields of ethnobotany and ethnobiology. It is essential to understand the historical, as well as current day, issues and contexts that Indigenous Peoples face as a result of colonization and how these impacts affect ethnobotanical knowledge and related practices. This study is born out of a desire for deeper critical engagement with the intersections between colonial history, intergenerational trauma and the fields of ethnobotany and ethnobiology. Furthermore, this work acknowledges the strength and resilience of Indigenous Peoples in the face of historical injustice. Current day Indigenous cultural and political resurgence is a testament to the generations who, while under direct attack, fought to hold on to pieces of culture, language, identity, and integrity in order to offer future generations the opportunity to move towards renewed health, connection to the land and cultural identity.

In a time of Indigenous Resurgence, my PhD research focuses on the health and well-being of Canadian Indigenous Peoples in connection to their interrelationships with culturally important plants. My work is conducted partially within the context of the Type 2 Diabetes crisis taking place in Indigenous communities across Canada with the prevalence of Type 2 Diabetes being three to five times higher than the general population and diagnosis happening at younger ages. I worked with my home community in *Sḵwx̱wú7mesh* (Squamish) First Nations in British Columbia to explore taking ethnobotanically grounded approaches to the prevention and management of Type 2 Diabetes within the broader context of what role culturally important plants play in cultural renewal, healing, and wellness from an Indigenous perspective.

Research Theoretical Framework Summary

Linda Tuhiwai Smith's book, *Decolonizing Methodologies: Research and Indigenous Peoples* is a foundational text for my work. In my writing I also draw on other Indigenous ethnobiologists and authors including Robin Kimmerer (2013), Gregory Cajete (2006), Enrique Salmón (2012, 2017), Mary Siisip Geniuz (2015), Leanne Betasamosake Simpson (2018).

Grounded normativity is a concept introduced by Dene scholar and activist Glen Coulthard. He defines this as “the modalities of Indigenous land-connected practices and longstanding experiential knowledge that inform and structure our ethical engagements with the world and our relationships with human and nonhuman others over time” (2014, 13). In her book “As We’ve Always Done,” Leanne Simpson describes this same concept as the “ethical frameworks generated by place-based practices and associated knowledges as it applies to Indigenous Worldview (2018). Simpson also writes about the term “radical resurgence”. She expresses that “radical resurgence requires a deeply critical reading of settler colonialism and Indigenous response to the current relationship between Indigenous peoples and the state” (Simpson, 2018, 46). Furthermore, she contextualizes that the term “radical” as “a thorough and comprehensive

reform;" a term she uses to "channel the vitality of (her) Ancestors to create a present that is recognizable to them because it is fundamentally different than the one settler colonialism creates" (page 46). Simpson clarifies that radical is not "a term to mean crazy, violent or from the fringe" (Simpson, 2018, 46). The concept of grounded normativity is one that I came back to time and again while writing and carrying out my research.

During the course of my research, I took a process-oriented approach, and I drew on Community Based Participatory Action Research (CBPAR) and Insurgent Research as key resources and frameworks throughout the duration of my work (Dowling, 2005; Gaudry, 2015; Pukonen, 2008). CBPAR integrates guidance and collaboration with community at every step of the research process and demonstrates reflexivity throughout which was crucial when taking a process-oriented approach to my research. Insurgent Research (IR), a term coined by Metis researcher Adam Gaudry, is motivated by "grassroots-academic collaborations that resituate Indigenous interests and values in an otherwise alienating research process" (Gaudry, 2015).

The principles for Insurgent Research are as follows:

1. Research is grounded in, respects, and validates Indigenous worldviews.
2. Research output is intended for use by Indigenous communities.
3. Researchers are responsible to Indigenous communities for the decisions that they make, and communities are the final judges of the validity and effectiveness of research projects.
4. Research is action oriented and inspires direct action in Indigenous communities.

Participatory methods, along with methods rooted in Indigenous worldview, make the voice of the community members explicit in all research phases. Undertaking anticolonial approaches to ethnobotanical research necessitates that Indigenous voice be central throughout the research process from design to publication, (Gaudry, 2015; Posey, 2003; Tuhiwai Smith, 2012).

Research Questions

Based on the six principles that guide this research, and the theoretical model summarized above, in this dissertation I examine the decolonization and indigenization of the ethnobotanical research process. Furthermore, I identify and highlight ways that Indigenous communities can empower themselves to reconnect to culturally important plants through ethnobotanical research partnerships. I offer that revitalizing harvesting and other related Indigenous plant-based practices are acts of radical resurgence, and resistance. The act of harvesting a plant food or medicine is in opposition to the dominant colonial system which set out to stop these harvesting practices by attempting to sever Indigenous relationships with the land. I ground my research in these Indigenous principles and theories and ensure that this work is rooted in land-based knowledge and relationships.

Drawing on trends in ethnobotany, ethnobiology, and Indigenous studies I set out to answer the following interrelated questions:

1. How might developing an indigenizing and decolonizing approach to ethnobotany move the field forward to the benefit of the communities we work with, and situate the discipline as a positive contributor to Indigenous cultural-political resurgence in Canada?

2. How can culturally important plants help connect a *Sḵwx̱wú7mesh* (Squamish) person's sense of health (physical, spiritual, and emotional) to place? What do the connections between plants, health and place mean to the participants themselves?
3. What role do culturally important plants play in developing approaches to addressing Type 2 Diabetes from an Indigenous conceptualization of health?

These questions emerge from overarching themes and priorities that were shared in initial discussions and consultation with the *Sḵwx̱wú7mesh* community. The results of this study share a *Sḵwx̱wú7mesh* perspective on culturally rooted approaches to health and wellness through rebuilding Indigenous plant relationships. The results of this work provide a framework for other Indigenous communities interested in reconnecting with their traditional plant practices as well as addressing Type 2 Diabetes in a culturally relevant way using tools and knowledge from the field of ethnobotany. The research also provides a framework and tools for Indigenous and non-indigenous researchers to apply a critical lens to their field, and to how they conduct community-based research in respectful and reciprocal ways. I assert that the primary goal of ethnobotanical research must be to contribute positively to Indigenous cultural and political resurgence through the work they conduct in partnership with Indigenous communities.

Furthermore, I argue that it is essential to understand the colonial impacts that affect the Indigenous Communities we work with as ethnobotanists and researchers. We must ensure at a very base level that we are not causing harm. Beyond this, we should consistently be striving to build relationships and conduct our research from a place of the highest ethical standard and in the most informed way that we can. It is necessary to identify our own blind spots regarding concepts such as unearned privilege, unconscious bias, racism, and white fragility as they may influence our work with Indigenous Communities. Secondly, it is essential to recognize that "race as a social construct has profound significance and shapes every aspect of our lives. Race will influence whether we will survive our birth, where we are most likely to live, which schools we will attend, who our friends and partners will be, what careers we will have, how much money we will earn, how healthy we will be and even how long we can expect to live" (Diangelo, 2018, pg. 5). Understanding the implications of race and how it affects Indigenous People situates our work in a place of deeper understanding and empathy. This in turn may also enhance the benefits of our work within Indigenous Communities by operating from an informed and self-aware place.

All ethnobotanists and ethnobiologists—non-Indigenous and Indigenous—benefit from the knowledge of the communities that we work with. With these benefits comes a responsibility to conduct ourselves in respectful and reciprocal ways. As we know there is a long history of extractive and damaging research that has been conducted with Indigenous Communities (Antoine, 2017). We want to ensure that we are not perpetuating such practices: reflexivity and the practice of critical self-reflection are important here. There are many excellent resources to educate oneself on the history, impacts, and ongoing legacy of colonization in Canada. In addition, the Belem Declaration (Belem 30 Declaration, Ethnobiology) acts as a 'code of conduct' for the field of ethnobiology and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) offers guidance on how ethnobiology/ethnobotany can support the rights of Indigenous Peoples. Foundational beliefs of meritocracy and individualism are often cited to explain socioeconomic discrepancies between white and Indigenous communities,

or other people of color (Diangelo, 2018; Battiste, 2013). We live in a society where the dominant white settler culture determines the policies, laws, and systems of education; and these systems are rooted largely within white experiences and perceptions of the world.

In Canada, there is a lived reality for Indigenous peoples, at the intersection of colonial history and racism. Racism is the ideology and intolerance, prejudice and discrimination are the practices with which this ideology is carried out (Battiste, 2013). Discrimination is action based on prejudice and when a "racial groups collective prejudice is backed by the power of legal authority and institutional control, it is transformed into racism" (Diangelo, 2018). Practitioners of ethnobotany and ethnobiology must be aware of these historical and present-day realities for Indigenous peoples, and we will encounter colleagues, superiors, students, family members or friends who base their understanding of Indigenous People in racist ways. To choose silence in the name of maintaining comfort is to make a decision that upholds racism. Though it is often easier to choose silence, to relegate people of color to the margins or even deem them invisible in the name of maintaining comfort, is unacceptable.

In my subsequent chapters I explore the following themes and ground my writing in my own critical self-awareness and in my ongoing and ever deepening self-education about the impacts of colonialism on Indigenous Peoples as well as how these impacts have affected my life. I also develop tools and frameworks for Indigenous and non-indigenous researchers to apply to community-based ethnobotanical research. It is my hope that through making these contributions to the literature in my field that I will address a gap that I experienced as an Indigenous student and that my work will contribute to the groundwork of Indigenizing the field of ethnobotany.

Chapter 2 of this dissertation, titled "Walking on Our Lands Again: Turning to Culturally Important Plants and Indigenous Conceptualizations of Health in a Time of Cultural and Political Resurgence," was published in the *International Journal of Indigenous Health* in November 2020. In this paper I explore the role that rebuilding Indigenous plant relationships plays in addressing colonial impacts on Indigenous health and in supporting Indigenous cultural and political resurgence. I also put forth Indigenized models for understanding colonial impacts on health and discuss culturally rooted conceptualizations of health that address these impacts from an Indigenous point of view. Finally, I propose a set of guidelines to consider for conducting respectful ethnobotanical research within Indigenous communities. This paper is borne out of a desire for deeper critical engagement with the intersections between colonial history, intergenerational trauma, and Indigenous plant knowledge.

Chapter 3 is a paper published in *Botany*, in February of 2022. It is titled "Shifting narratives, recognizing resilience: new anti-oppressive and decolonial approaches to ethnobotanical research with Indigenous communities in Canada." I explore the importance of carrying out research in trauma informed ways while prioritizing anti-oppressive, decolonial, and strength-based approaches to research and collaborations with Indigenous communities. Furthermore, when working with Indigenous communities on projects, it is essential to understand the history, impacts, and ongoing struggles related to colonization and genocide in North America to ensure to not cause harm and to contribute positively to these communities. Indigenous People have undergone changes in diet and land access, including cultivating and harvesting plants for health and wellbeing. Recognizing and understanding the impacts and implications of colonization on

land-based knowledge is fundamental in carrying out meaningful work within Indigenous communities in the field of ethnobotany. Conducting ethnobotanical research from this place supports revitalizing Indigenous land-based practices which is an act of Indigenous resurgence and resistance.

Chapter 4 is a paper, titled "Wáts'iyus Harvest Basket Model: Turning to Ancestral Plant Knowledge to Develop Indigenized Strategies Towards the Prevention and Management of Type 2 Diabetes: A Sḵwx̱wú7mesh (Squamish) Nation Case Study." It will be submitted for publication soon. This paper focuses on a case study from the Sḵwx̱wú7mesh (Squamish) Nation and presents a framework for integrating culturally grounded botanical approaches into the prevention and management of Type 2 Diabetes. This research behind this paper was grounded within concepts from Community Based Participatory Action Research (CBPAR) and Insurgent Research. CBPAR integrates guidance and collaboration with the community at every step of the research process and demonstrates reflexivity throughout. Insurgent Research (IR), a term coined by Metis researcher Adam Gaudry, is motivated by "grassroots-academic collaborations that resituate Indigenous interests and values in an otherwise alienating research process" (Gaudry, 2015). The Harvest Basket Model presented in this paper is one that centers Indigenous voice, perspective and worldview. This model informs how ethnobotanical research can further the understanding of the colonial factors that influence the levels of Type 2 Diabetes in Indigenous communities and become part of the solution in supporting communities to reconnect to culturally grounded, land and plant-based health and wellness practices. The Harvest Basket Model is a tool that is designed to be applicable and useful to diverse Indigenous communities interested in incorporating plants into their health and wellness programs.

During my doctoral research, I also co-authored two journal articles that have been informed by or contributed to the evolution of ideas presented in my dissertation. First: "The Old Foods are the New Foods!": Erosion and Revitalization of Indigenous Food Systems in Northwestern North America" published in *Frontiers in Sustainable Food Systems* (Joseph and Turner, 2021). With my co-author, Nancy Turner, we examined the global "nutrition transition" and the impact it has had on Indigenous Peoples of Northwestern North America. From an original diet comprised of mostly local plant and animal foods, including salmon, game, diverse plants, seaweed and other marine foods, many Indigenous people are now eating mostly imported, refined marketed foods that are generally less healthy, and many are at risk of diet-related diseases such as type 2 diabetes. Nevertheless, Indigenous people have always valued their ancestral foods, and over the last few decades there have been many initiatives throughout the region to restore and revitalize these original foods, and to re-learn Indigenous methods of processing and harvesting them. In this paper we describe the original Indigenous food systems in the study region, and the methods used to sustain and promote the ancestral food species and habitats. We then discuss the impacts of colonization and describe recent and ongoing Resilience and Resurgence in relation to ancestral foods and food practices, including firsthand experiences with renewing food traditions. These initiatives are often connected with language revitalization and cultural resurgence programs. Led by Indigenous communities, they are undertaken with support of academic, government and other partners. In all, they have resulted in stronger, more vibrant cultures and generally healthier communities.

The second co-authored journal article, along with Nancy Turner and Alain Cuerrier, is “Well grounded: Indigenous Peoples' knowledge, ethnobiology and sustainability,” published in the *People and Nature* (Turner, Cuerrier and Joseph, 2022). We examined the nature and significance of Indigenous Peoples' knowledge systems concerning environmental sustainability, as documented in collaborative ethnobiological research. We emphasize the diverse aspects of Indigenous knowledge in conservation, and the role played by ethnobiologists in respectfully highlighting this knowledge, and link these to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Global Assessment's key levers and leverage points for enabling the transformative change required for achieving more sustainable lifeways. Drawing on diverse ways of knowing—respectfully, collaboratively, ethically, and reciprocally—can help provide more detailed knowledge of local ecosystems and guide all humans towards greater sustainability.

Finally, I have mobilized by scholarly work into a more accessible and widely available non-academic book, *Held By The Land: Indigenous Plants for Wellness* (Joseph, 2023) . While it is vital that ethnobotanists produce per-reviewed publications, so too should we challenge ourselves to disseminate out work more broadly, in formats accessible to our community partners and the public more broadly. In *Held by the Land,* I invite readers to explore our natural surroundings and renew our connection to the land. With lyrical, meditative prose, I advocate for a way of living that develops and builds relationships with the plant life around us, viewing ourselves as part of the ecosystem rather than separate from it. In this work, I recount my journey of reclaiming ancestral knowledge and practices that were impacted by centuries of colonization and rejuvenating them for future generations.

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Chapter 2: Walking on Our Lands Again: Turning to Culturally Important Plants and Indigenous Conceptualizations of Health in a time of Cultural and Political Resurgence

Abstract

We are in a time of Indigenous cultural-political resurgence in Canada (Coulthard 2014; Manuel 2017; Simpson 2017; Talaga 2018). Increasingly, Indigenous Peoples are finding renewed strength, pride and grounding through cultural practice and re-establishing connections to the land. Included in this resurgence are the relationships between people and plants. When we practice our ancestral relationships with our plant relatives we heal and strengthen ourselves. The depth of connection to place, to ancestors and to our own mindful presence is amplified when we partake in millennia old practices of plant cultivation, stewardship and the integration of plant foods and medicines into our bodies. This time of resurgence emerges from generations of Indigenous Peoples who suffered devastating violence, losses and trauma as a result of colonization. In this paper I will address the role that rebuilding Indigenous plant relationships plays in addressing colonial impacts on Indigenous health and in supporting Indigenous cultural and political resurgence. I will also put forth indigenized models for understanding colonial impacts on health and culturally rooted conceptualizations of health that address these impacts from an Indigenous point of view. Finally, I will propose a set of guidelines to consider for conducting respectful ethnobotanical research within Indigenous communities. This paper is born out of a desire for deeper critical engagement with the intersections between colonial history, intergenerational trauma and Indigenous plant knowledge. Furthermore, this paper acknowledges the strength and resilience of Indigenous Peoples in the face of historical injustice.

Introduction

The colonial project in Canada has led directly to the loss of access to land, loss of culturally important foods and medicines, loss of spiritually and culturally important places and the demonization and criminalization of Indigenous Language, and ceremony (Armstrong and McAlvay 2019; Coulthard 2014; Elliott 2019; Geddes 2017; Maracle 2017; Paradies 2016; Regan 2010; Simpson 2017; Talaga 2018). The intentional separation of Indigenous bodies from the land served the purpose of disenfranchising people and removing them from their source of power, strength, health and wellbeing. (Simpson 2017; Coulthard 2014; Estes 2019).
These impacts have directly affected Indigenous health in Canada. In this age of reconciliation and decolonization all Canadians have a shared responsibility to educate themselves on colonial history and the ongoing impacts and legacies for Indigenous Peoples in Canada (TRC 2015). Current day Indigenous cultural-political resurgence is a testament to the generations who fought to hold on to pieces of culture, language and integrity in order to offer future generations the opportunity to move towards renewed health, connection to the land and cultural identity (Estes 2019; Simpson 2017; Talaga 2018).

My Story

I feel it is important to share some context on my positionality as the author of this paper. My ancestral name is *styawat*. I am a member of the *Sḵwx̱wú7mesh* (Squamish) First Nation on my father's side and from English and Sephardic Jewish ancestry on my mother's side. I was raised primarily with my Coast Salish heritage. One of the most powerful ways I have found to connect

to culture and contribute to community has been through my academic studies in the field of ethnobotany, the study of the interrelationships between people and plants.

My studies have been shaped in ways by my experiences with intergenerational trauma. Through my academic pursuits I have found a path to cultural renewal and healing. I largely attribute my personal healing to the resiliency and strength of my family, many of whom survived unimaginable traumas and losses. My story is part of a continuum along with a vast majority of Indigenous People in this country who are working through the impacts of intergenerational trauma (Lafferty 2018; Elliott 2019; Simpson 2017). The struggles and dysfunction within my family history are in direct response to the state-sanctioned racism and violence that was foundational to residential schools and colonization in Canada. I share this personal context as a call to action to educate ourselves as a society about the colonial history in Canada, how it affects individuals as well as communities, so that we as researchers might better understand our indirect roles in upholding racist or discriminatory ideologies and constructs (Diangelo 2018; Regan 2010; McIntosh 1988; Maracle 2017).

Being Held Beloved by the Land

When I am out harvesting on the land I am completely present in my body, mind and spirit. I am partaking in an activity that my ancestors have practiced since the beginning of time and when my children are with me we are sharing ancestral knowledge. The act of harvesting connects me to the plant, to the land on which I stand and to my own heart and mind. Harvesting offers me a path to mindfulness and healing. I have been taught to introduce myself to the land on which I travel and to the plants I am working with *properly*. This means to consider ancestors who are ever-present on the land. I've been taught to explain where my family line comes from, who my parents and grandparents are and to show respect for those who have walked before me. This practice serves to create a deeper connection with place, knowing that your family has walked the same estuaries, forests and mountains since time before memory. I believe a deep layer of Indigenous Plant Knowledge and Practice is the innate memory that lives within the spirit and body that recalls the act of going out on the land to cultivate, harvest, transplant, burn, gather as family and nourish oneself. I term this *ancestral memory*. I've felt this as I've harvested and as I've developed my own relationships with Indigenous plants. Developing a feeling of ease on the land takes time and experience. The belief in the presence of ancestors on the land can help facilitate the feeling of ease, belonging and of being at home in natural spaces.

When I teach about plants in Indigenous Community, I start by asking people to remember a time when they first learned about a culturally important plant. Or to recall an important person in their lives who may have taught them about plants. This starts with the seed of a memory. A particular color, smell, texture or place that transports them to memories of shared time with family out on the land. The beauty of Indigenous connection to the land through plants is that it is rooted in context, story, specific locality and loved ones (Turner and Turner 2008; Kimmerer 2013; Geniusz 2015; Simpson 2017). Beginning a discussion from this place of personal history, and within cultural context, immediately prioritizes the participant by starting from a place that is meaningful to them.

Turning to Teachings from Our Plant Relatives

It is generally agreed that plants connect Indigenous People to place in very specific and meaningful ways (Basso; 1996; Corntassel & Bryce, 2012; Cruikshank1990, 2007; Cuerrier, Tuner, Gomes, Garibaldi, & Downing, 2015). Prior to European contact, Indigenous Peoples in Canada relied on their ancestral territories for food, medicine, and the material resources necessary to thrive, both physically and spiritually. "Our food is our medicine" is a phrase commonly heard in Indigenous communities that indicates the extent to which culturally important plants and are intertwined with the concept of health. Plant-focused cultural practices begin with respectful awareness of a plant relative. Where does it grow? When does it bloom? How can it be harvested respectfully and sustainably? What can be done to ensure its viability through propagation, such as root division, seed collecting, stem cuttings? What can be done to protect and nurture the place where it grows and reproduces such as weeding, pruning, and controlled burning? Kuhnlein (1996), in her examination of the loss of traditional food systems, emphasized that, "this is a loss of food use as well as a loss of the knowledge required to recognize, harvest, prepare, and enjoy traditional indigenous food resources. It is also a loss of knowledge to all humankind. The consequences of this loss to indigenous peoples are recognized not only culturally, but as a corollary to a variety of chronic diseases that have food and compromised nutritional status within their etiology" (p. 432). Relatedly, Simpson (2017) identified the magnitude of loss resulted in an "imposed poverty" for people who held such wealth in their reciprocal relationships with their environments and prior to contact enjoyed a high standard of living, including healthy diet, stable social relationships and a knowledge of their land and its resources.

Critical Reflections on Ethnobotany

The majority of ethnobotanical research in Canada to date has been conducted from a western European viewpoint and carried out by non-Indigenous academics. Though there exists a history of meaningful collaboration between ethnobotanists and Indigenous Communities, it is important to be mindful that inherent power differentials continue to exist between researchers and Indigenous People. These power differentials are grounded in the colonial constructs which western academic institutions are largely built on. These are factors that can lead to polarization between Indigenous *ways of knowing* and how ethnobotanical research is conceived and carried out (Wilson 2008; Thomas 2015; Gaudry 2015; Battiste 2013; DeLeeuw, Cameron, and Greenwood 2012). The original definition of ethnobotany coined by John Harshberger in 1896 "the study of the plant use by *primitive* peoples" demonstrates the direct colonial underpinnings of the genesis of this field (Fuller 2013). Indigenous relationships with plants are an ancient and integral part of the cultural fabric for Indigenous Peoples. These relationships with plant relatives shape Indigenous Worldview (Geniusz 2015; Turner 2005; Simpson 2017; Kimmerer 2013). Ethnobotanists carry a responsibility to ensure that they are considering the impacts of their research on the lives and well-being of the people and the plants that they work with. There is always room for further learning and the development of a deeper understanding of the colonial impacts and ongoing issues affecting Indigenous Communities in Canada. Ethnobotanists are well-situated to step into purposeful relationships with the communities they work with. An important starting place is to take a critical look at our own self-awareness and continued efforts to work in the most respectful and informed ways possible.

Introducing an Indigenous Model for Colonial Impacts on Cultural Knowledge
I propose the following "indigenized" model as a way to conceptualize the impact of colonization on cultural knowledge, specifically with respect to knowledge about plants and the way that plants bind people to the land both physically and spiritually. I have chosen to approach this model from my positionality as a Sḵwx̱wú7mesh woman, however, this model can be readily adapted to other Indigenous communities.

I use the Squamish language, Sḵwx̱wú7mesh sníchim, to orient this model in keeping with an Indigenous worldview: Skwálwen, translates approximately to "spiritual heart," temíxw to "land," stelmexw to "people," and spéńem to "plants." Each of these categories show, first, the "gift" that, for example, plants make in terms of nourishment and well-being, followed by the "impact" of colonial disruption on these gifts, such as loss of habitat and negative changes in diet. As shown in Figure 1. Indigenous health is directly linked to the land, culture and spirituality. This figure is intended to be illustrative rather than comprehensive; the idea is to highlight the impact of colonization on a number of aspects of Indigenous culture, and to demonstrate that healing is conceptualized in terms of interconnectedness.

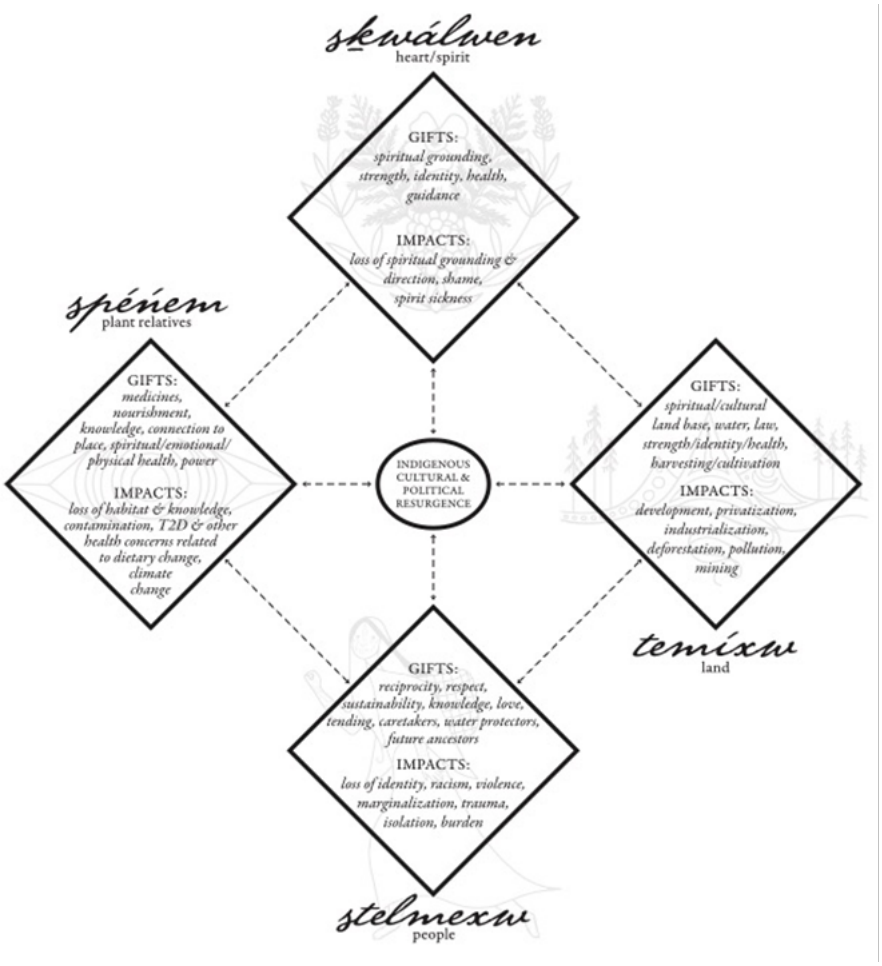

Figure 1. Indigenous cultural and political resurgence depends on the spiritual and physical connections between the four categories identified here: land, people, plant relatives, and spiritual grounding.

Indigenized Plant-based Model for Conceptualization of Health

Indigenous health and wellbeing are frequently conceptualized as part of a greater whole holistic in the sense that wellness can only be achieved by ensuring that the interrelated parts are connected and tied together: culture, language, spirituality, and the cultural practices that keep the connections animated. For me the Squamish conceptualization of health, from a plant-based perspective, invokes the image of the wild rose—kalkáy—which functions as a model for seeing health through an ethnobotanical lens. I chose to use kalkáy (cal-kay) as a basis on which to develop my model given its cultural importance. The rosehips (fruit), petals, young leaves, and peeled shoots can all be eaten and utilized as medicine. It is a plant that represents the idea of interconnectedness of plant medicines, food plants, and health. I developed this model in collaboration with an Indigenous artist as a way to ground the model with respect to the Indigenous worldview. The center of the plant represents the idea that good health requires a number of connected elements—which are depicted here as petals—each referring to a culturally–grounded requirement for health from an Indigenous viewpoint.

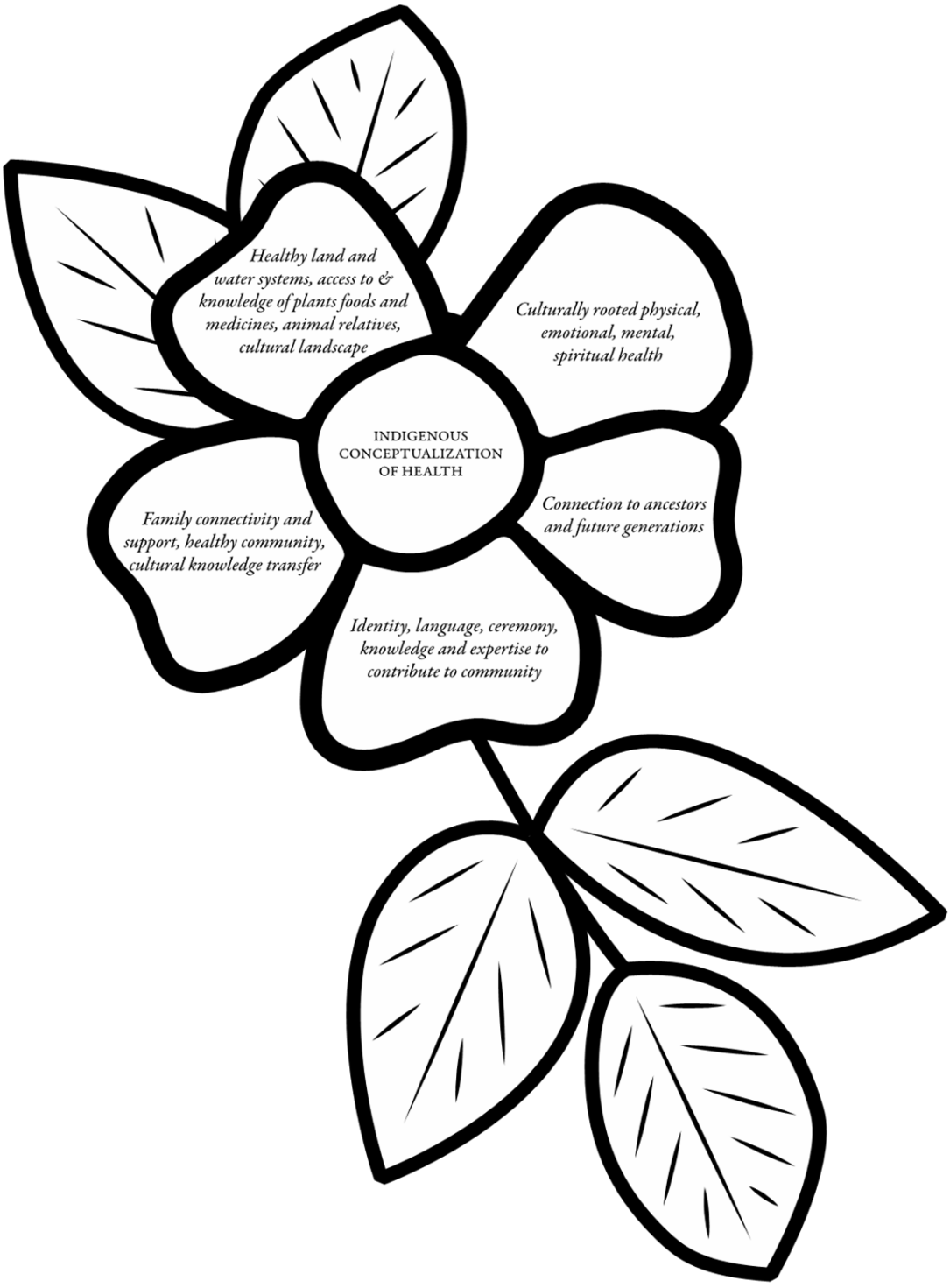

Figure 2. The Kalkáy (Wild Rose) depicts an Indigenous conceptualization of the social and cultural determinants of health, emphasizing the layered and interconnected nature of the parts that make the whole. (Developed by author in collaboration with Indigenous artist Ocean Hyland).

Anti-colonial and Decolonizing Approaches in Plant-related Research and Programs

In a time, when Indigenous plant-related literature appears to be shifting its focus to the notion of decolonization, it is prudent to ensure that the language used avoids the pitfall of superficiality. Linda Tuhiwai Smith (2012) proposes a number of "decolonizing methodologies," noting that colonization is but one expression of imperialism, and that research conducted from an imperialist viewpoint foregrounds the Western perspective as the most rational way to make sense of the world. Imperialism dictates that those who hold power are those who write history—a history that confers the designation of both human and "other" from the dominant perspective. The Western academy has long internalized colonial representations of history and humanity, which has often meant the exclusion of Indigenous voices, histories, and culture. This has led to research being used as a tool to, knowingly or unknowingly, dehumanize and disempower Indigenous peoples and maintain their status as *other*.

How do we then decolonize research within an institution that is inherently colonial in nature? One path forward necessitates that Indigenous people lend their voices and perspectives to "re-storying" dominant Western history—that is, to provide alternative histories from non-European perspectives, thereby allowing Indigenous people to move forward in alternative ways and look towards alternative futures (Corntassel, Chaw win, & T'lakwadzi, 2009). *Know where we are going by knowing where we have come from*.

As Indigenous people and communities heal from the trauma inflicted by colonization, more and more individuals are contributing their voices and perspectives to the question of change that needs to be made on many fronts, including the way in which research is conceptualized and carried out. Change often brings about feelings of unease and discomfort. Changing the research relationship between Indigenous and non-Indigenous researchers and communities is part of this necessary growth. Leanne Simpson (2004) proposes that "academics who are to be true allies to Indigenous Peoples in the protection of our knowledge must be willing to step outside of their privileged position and challenge research that conforms to the guidelines outlined by the colonial power structure and root their work in the politics of decolonization and anticolonialism". Similarly, Linda Tuhiwai Smith (2012), outlines an anticolonial and decolonized approach to research that focuses on the central goal of self-determination, one that recognizes the need for healing, decolonization, transformation, and mobilization of Indigenous peoples.

Indigenous Plant Relationships as Radical Resurgence

I propose that the process of revitalizing Indigenous land-based practices, such as cultivation, harvesting, and stewardship, are acts of radical resurgence, and thereby also a means of resistance.. The very act of cultivating and harvesting plants for food and medicine can be seen as an act of opposition, a turning away from the colonial apparatus that was once intent on eradicating Indigenous cultures in the name of the colonial project—a project that intentionally dispossessed its original inhabitants of their territory and cultural knowledge, not least of which, the knowledge of plants.

Harvesting can be seen as a political act as much as it is a cultural and ceremonial practice. Ceremony is linked to Indigenous law, spirituality, cultural understandings, language, relationality, and reciprocity. Cultural protocols—such as speaking directly to plant relatives, leaving an offering when harvesting, and attending to teachings that come in the form of dreams

and visions—are embedded within Indigenous ways of knowing(Geniusz, 2015; Kimmerer, 2013). Reo (2018), an Indigenous professor of environmental studies, encourages the practice of "relational accountability"—a position that will constitute "an ethical guideline for conducting research with Indigenous nation partners, [because it] references the kincentric beliefs among many Indigenous Peoples. It implies that researchers are responsible for nurturing honorable relationships with community collaborators and are accountable to the entirety of the community in which they work, potentially including collaborators' more-than-human network of relations". Relational accountability, along with what I understand to be "ancestral reciprocity" can be seen as consent-based harvesting, involving practices such as introducing oneself, asking permission to harvest, giving thanks, and harvesting in a sustainable way—in other words, engaging in any number of practices that show respect for our plant relatives.

Researching Respectfully and Responsibly with Indigenous Communities

This paper has briefly summarized the historical and ongoing impact of colonization for Indigenous Peoples in Canada, with attention to the intersection between colonial history and the field of Ethnobotany. It is my assertion that ethnobotanists are required to understand the Indigenous context as a first principle, as are scholars engaged with Indigenous research topics. Part of this process is to endeavour to decolonize their own thinking and work to stay critically engaged with their subject matter. Exploring the renewal of plant knowledge in the context of Indigenous resurgence and from an Indigenous perspective is a pressing research need in the field of ethnobotany. Colonial impacts on cultural plant knowledge along with the lack of widespread understanding of how colonization influences Indigenous health has yet to be taken up in the ethnobotanical literature.

We All Have Blind Spots

Blind spots are the places where it is difficult to identify or recognize our own bias, privilege and fragility. By identifying our blind spots we can then address them through education and self-reflection. The following list is not meant to be comprehensive but it is a starting point for considering where blind spots may exist.

1. A researcher may assume that Indigenous People are not capable of understanding their research thus they don't conduct meaningful consultation or disseminate their findings.

2. A researcher may not incorporate community interests or priorities into their research because they don't fit with their vision or what they think is best.

3. A researcher may expect Indigenous People to be 'on their research/writing/funding schedule' and become upset, judgmental or critical when that is not the case.

4. A researcher may opt for judgment and condemnation of dysfunction in Indigenous Communities instead of taking the time to understand the underlying impacts and issues that have led to such dysfunction. On the inverse a researcher may not recognize the resiliency and healing taking place within communities.

5. A researcher may end up interrupting or explaining for elders or community members who they assume don't know the answer if they don't speak or respond quickly enough.

6. A researcher may end up only listening to one person and taking their word to represent the entire communities' perspectives.

7. A researcher may try to take ownership over knowledge that is not theirs in order to elevate them personally. They may do this by not acknowledging or crediting who or where the knowledge that informs their work comes from.

8. A researcher may not recognize the privilege that they carry and thus miss the opportunity to use that privilege for good.

As educators we need to consider how we create space for inclusivity and equality in our classrooms. The sentiment 'you only know what you know' applies to professors, researchers or teachers who have not experienced racism directly. Understanding the role of racism at an institutional level along with the impacts on the people with whom you conduct research, is an important part of identifying blind spots that may exist in relation to carrying out anticolonial and indigenized research and education.

The following are some recommendations for working in a respectful and reciprocal way when conducting ethnobotanical research with Indigenous populations:

1. Identify and follow the protocols for the specific Indigenous individual, family, and community you are working with.

2. Understand that your timeline is not necessarily a community priority. Be prepared to balance the necessity of meeting your institutional and funding requirements with the equal necessity of maintaining a respectful engagement with community.

3. Start by listening and developing relationships. Relationship-building requires being present in the community in ways that may also mean offering to help with other and unrelated work that needs doing (e.g., making tea, cutting wood, cleaning the yard, processing food).

4. Develop a relationship with someone in the community who is willing and, in a position, to give you guidance and act as a point person. Be mindful that the first person to surface isn't necessarily the best fit. Look to Elders, community leaders, and department heads.

5. If you are not sure ask, especially when it comes to protocol, gift giving, respectful behaviour, attending ceremonies, or recording information.

6. Have a foundational understanding of the history of the community you are working in, the impacts of colonization and to continue to develop your understanding of the far-reaching impact of historical processes. Be aware of current challenges faced by Indigenous people so that you can work in a more engaged and respectful way.

7. Do not publish, present, or in any way share Indigenous knowledge without community consultation and explicit permission.

8. Follow Ownership, Control, Access and Possession (OCAP) guidelines as a standard when working with Indigenous Knowledge. Disseminate your findings in a way that contributes directly to the community you are working with. Always credit individuals for their knowledge and contribution (unless they specify anonymity); recognize that any non-indigenous scholar is writing from an outsider perspective and that it is important to incorporate Indigenous voices and perspectives into your writing and also to consider writing from a place of critical reflection.

9. Be cautious of overburdening individuals or departments within the community you work with. Often the most culturally active people are the busiest. Consider how much energy, time, and space you take away from people and resources that are dedicated to community and remunerate people for their time. Be aware that Elders should be remunerated at a higher rate for their time due to their status within community. Ask if the community has a remuneration structure already in place. If not co-develop one with the community.

10. Gift giving and reciprocity is a central teaching across many Indigenous Communities. The practices vary but giving back and redistributing wealth in the form of Indigenous foods, plant medicines, or other gifts is deeply appreciated, enacts reciprocity, and honours the mutually beneficial nature of a healthy research relationship.

11. Give back. If your research deals with Indigenous knowledge, culturally important species, or cultural "keystone" places, be sure to share your research privilege and resources by offering opportunities for Indigenous community members to engage with and (re)connect to the subject of your research. This may include capacity building through training community members, conducting meaningful knowledge translation of practical and tangible results that community may integrate into programs and decision making.

In conclusion, researching and collaborating from a place of respect and reciprocity can help us, as ethnobotanists, learn how our skills and expertise can best contribute to the communities we work with. By taking the time to develop a critical awareness of the extent to which colonization has disrupted and fractured the transmission of Indigenous cultural knowledge, and by becoming aware of our own biases when it comes to our understanding of settler history, ethnobotanists stand to be meaningful allies to the Indigenous communities we work with.

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Chapter 3: Shifting Narratives, Recognizing Resilience: Taking Anti-Oppressive and Decolonial Approaches to Ethnobotanical Research with Indigenous Communities in Canada

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Abstract
Revitalizing harvesting and other Indigenous land-based practices are acts of radical resurgence and resistance. The presence of Indigenous bodies occupying space on the land in order to nourish and strengthen themselves through ancestral harvesting practices is a political act. These culturally significant systems of knowledge and practice are in direct opposition to historical and ongoing colonial attempts to dispossess Indigenous peoples of their cultural connections to the land. Indigenous People in North America have undergone catastrophic changes in diet, land access and related practices, including cultivating and harvesting plants to support health and wellbeing. Recognizing and understanding the impacts and implications of colonization on land-based knowledge and relationships is fundamental to carrying out meaningful work within Indigenous communities in the field of ethnobotany and botany more broadly. Much of the literature and mainstream media stories that focus on Indigenous issues continue to uphold trauma narratives. I argue that as researchers working with Indigenous communities on plant-related projects it is essential to understand the history, impacts and ongoing struggles related to colonization and genocide in North America in order to not cause harm and to contribute positively to the communities we work with. Furthermore, I assert that by taking our roles and responsibilities as researchers one step farther we can carry out process-oriented research in trauma-informed ways while also prioritizing anti-oppressive, decolonial and strength-based approaches to our research and collaborations with Indigenous communities to amplify the stories of resilience, strength and healing. We illustrate these points through a community-based case study from the Squamish Nation in British Columbia, Canada.
Keywords: Ethnobotany, Indigenous Knowledge, Plant Knowledge, Resurgence, Land-based Knowledge, Indigenous Plant Science

Introduction
Indigenous plant foods and medicines strengthen physical, mental and emotional health, prevent illness and connect those in relationship with them to place in a profound and meaningful way (Kimmerer 2013, Joseph and Turner 2021). The act of building relationships with culturally important plants involves in-depth knowledge of plant identification, lifecycles, timing of harvest, recognizing phenological indicators, developing sustainable management and harvesting practices guided by cultural worldview and practical lived knowledge accumulated over generations (Kimmerer 2013, Simpson 2017, Turner 2014b, a, Geniusz 2015). Despite a great interest in learning about Indigenous relationships with plants, there remains a pervasive lack of

recognition or acknowledgement regarding the complexities that colonial history brings to the field of ethnobotany. It is essential, therefore, to understand the historical, as well as present-day issues and contexts that Indigenous Peoples face as a result of colonization. These issues continue to impact and undermine Indigenous ethnobotanical knowledge, related practices, and land access (Kimmerer 2013, Simpson 2017, Geniusz 2015). This paper will explore what it means to take anti-colonial, strength-based approaches to the indigenization of the field of ethnobotany. We frame this paper around the following question: *How does integrating Indigenous plant knowledge into anti-oppressive, decolonial and strength-based approaches to research, empower Indigenous community partners to reconnect to culturally important plants?* To address this, we first outline the colonial context that must then be addressed with anti-oppressive research methodologies. We then propose a decolonial research strategy, and illustrate this with a community-based case study with the Squamish Nation, an Indigenous Coast Salish community in southwestern British Columbia. Before exploring the renewal of ethnobotanical knowledge in Indigenous communities it is essential to consider the historical and ongoing impacts and barriers to knowledge of an access to culturally important plants and their habitats. This section will highlight some key historical and present-day factors that impact Indigenous knowledge and access to the land, and in turn, to plants. One of the authors, Leigh Joseph, is from the Sḵwx̱wú7mesh First Nation, thus through the paper there will be references made to her connection to her community specifically and will share in first person throughout the case study.

Critical Context

The very foundation of colonialism has always been to separate Indigenous People, often forcibly and violently, from the land and its resources, including culturally important plant cultivation and harvesting areas, in order to gain uninhibited access for use by settler populations. The intentional separation of Indigenous bodies from the land served the purpose of disenfranchising people and removing them from their source of power, strength, health and wellbeing (Coulthard 2014, Estes 2019, Joseph 2018, Simpson 2017). Negative impacts to the land, including but not limited to, development, pollution, industry and extraction translate to negative impacts on Indigenous peoples' health and wellbeing and loss of biodiversity (Anderson et al. 2016, Greenwood, de Leeuw, and Lindsay 2018, Bartlett et al. 2007, Corntassel, Cha-win-is, and T'lakwadzi 2009). Understanding these colonial agendas, and the difference from—and opposition to—Indigenous relations to land, continues to frame Indigenous-settler relations. As such, it's important to briefly summarize the following factors that led to the colonial justification for land dispossession.

Perceptions of Land Use

Indigenous landscapes reflect long-standing, deeply respectful and reciprocal relationships involving intensive cultivation and management (Cuerrier et al., 2015, Turner 2014, Armstrong et. al, 2021, Kimmerer, 2013). The scale and magnitude of the Indigenous management of ecosystems broadly, and plant foods and medicines specifically, is phenomenal, and includes in British Columbia, for example, cultivated blue camas gardens, productive coastal and estuarine root gardens, managed Pacific crab apple orchards, ancestral seaweed harvesting and drying locations and wapato gardens (Garibaldi and Turner 2004, Turner 2005, 1999, Turner, Ignace, and Ignace 2000). These practices didn't require clearing in the same way European agriculture did; thus, the distinct cultural signatures on the land went unrecognized by settlers. However, the

privatization of land and deliberate separation of Indigenous peoples from their gardens and cultivation grounds, which played the role of grocery store and pharmacy, was felt viscerally by Indigenous peoples who found themselves suddenly on the other side of a fence, watching their foods and medicines being destroyed to make space for European development and agriculture. An early Victoria newspaper editorial sums it up as such, that the Lekwungen speaking Indigenous peoples were being "'improved off the face of the earth' to afford the white man room to increase and multiply" (Daily British Colonist, December 15, 1871). These factors, amongst others, continue to lead to the misappropriation of land and resources and pose ongoing barriers to the process of Indigenous reconnection to the land. Without adequate access to traditional territory in order to learn from and rebuild Indigenous plant-related practices, Indigenous peoples will continue to feel the anguish and anger rooted in their displacement from their homelands.

Colonial Acts of Erasure: Terra Nullius and the Doctrine of Discovery

Indigenous perceptions of landscapes have differed greatly from those of the Euro-Canadian society. Early European settlers arrived in what is now Canada and viewed the landscape as untouched and 'wasted' because it did not reflect European land use and development practices (Deur et al. 2005). This Euro-centric view of a wasted and uninhabited landscape led, in part, to the genesis of the concept of *terra nullius* translating to "nobody's land." A concept that was instrumental in the dispossession of Indigenous homelands (Asch 2002, McFarlane 2018).
The doctrine of discovery is connected to *terra nullius* and acted as "legal and moral justification for colonial dispossession of sovereign Indigenous Nations." A report from the Assembly of First Nations explains that discovery originated during a time when Christian explorers were engaged in the violent dispossession of Indigenous lands on behalf of their monarchs. There was no regard for the original inhabitants of the land, and the dispossession was driven by the idea of Euro-Christian racial superiority. This presumed superiority was used to justify the dehumanization, exploitation and subjugation of Indigenous peoples (Assembly of First Nations 2018).

UNDRIP: Political and Legal Context for Ethnobotanical Research

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is an important document for ethnobotanists working with Indigenous communities to become familiar with. The declaration clearly outlines the rights that Indigenous peoples hold in connection to the land, harvesting areas, as well as to aspects of cultural knowledge and practice that connect them to health. Article 24.1 states that "Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services." UNDRIP affirms Indigenous people's rights to culture, language, health and self-determination. It grants Indigenous peoples the right to prior and informed consent for land and natural resource-related decisions (United Nations 2007). This being said the implementation and enactment of UNDRIP is another issue and is not currently legally binding however it is important to be informed on how this changes in the future.

In 2019 the Canadian government passed the Declaration on the Rights of Indigenous Peoples Act (DRIPA) and in December 2020 Bill C-15 was tabled which, if passed, would guide the implementation of UNDRIP but does not grant it power of law.

Section 35 of the Canadian Constitution recognizes existing Indigenous and treaty rights in Canada and, when the constitution was patriated in 1982, these rights became entrenched in the supreme law of Canada. Section 35 doesn't create Indigenous rights but it does offer significant legal protection for existing rights and prevents Indigenous land rights from being extinguished (Joseph 2014, Wilt 2017). The Truth and Reconciliation Commission's (TRC) 94 Calls to Action also offer a framework for approaching ethnobotanical research in connection with the political and legal considerations listed above (Truth and Reconciliation Commission 2009).

As ethnobotanists, becoming familiar with UNDRIP, Bill C-262, Section 35 of the Canadian Constitution and the TRC Calls to Action, is not only constructive but is a responsibility for individuals working within an Indigenous context. These documents offer insight and understanding into the significance, and complexity, of Indigenous rights to the land and related land-based knowledge and practice. As ethnobotanists, working with Indigenous communities, we are in a position to support and contribute to Indigenous cultural and political resurgence. Our research offers one approach for facilitating reconnection to plant-based knowledge and practice, an important element of culturally-rooted health. Ethnobotanical research is also well situated to support knowledge renewal in connection to the assertion of land and harvesting rights.

Plants Teach us About Resilience

Plants can adjust to changing environments and thrive under the optimum level of disturbance that Indigenous plant management practices maintain (Anderson 2005, Geniusz Siisip 2015). One way of understanding the interplay between cultural plant management systems and plant adaptability in an Indigenous context is to shift away from the concept of "disturbance" and move towards the understanding of how upholding cultural "relationships" between plants and people ultimately complements the adaptability and resilience of plants (Anderson 2005, Turner 2014, Deur 2005). There are many examples of relationships between Indigenous Peoples and culturally important plants that are characterized by being mutually beneficial including the previous examples of estuarine root gardens, blue camas gardens, berry gardens, orchard gardens and more (Joseph 2012, 2020, Armstrong et.al, 2021, Beckwith 2004). Plants can adjust their growth strategies in response to Indigenous plant management practices which include but are not limited to: weeding, burning, tilling, replanting, pruning, companion planting and more (Turner 2014, Kimmerer 2013, Deur 2005). Plants are known to increase their productivity, enhance biodiversity and benefit overall ecosystem health when growing in culturally managed ecosystems (Armstrong et. al, 2021, Turner 2007, 2020).

Reconnecting to the Land Equals Healing Indigenous Bodies

Health and wellness from an Sḵwx̱wú7mesh perspective is directly connected to the land. The health of the land is integral to the health of the people who have been in relationship with the land over millennia. *Temíxw* is a Sḵwx̱wú7mesh (Squamish) word that translates to "land." This word carries embedded cultural meaning and is grounded in Sḵwx̱wú7mesh cultural identity worldview, language, ceremony, ancestral history, present and futures. The Sḵwx̱wú7mesh Temíxw will persist and support the bodies, spirits and lives of future generations. When Indigenous peoples were forcibly removed and relocated from their home territories and seasonal villages to reserve lands it equaled an attack on their identity, sovereignty, humanity and rights (Joseph and Turner 2021 Simpson 2013, Joseph 2018). We see the ongoing demonstration of

how the colonial system is set up to remove Indigenous Peoples when they are in the way of perceived 'progress and development' in the cases of pipelines, mines, hydroelectric dams and other large scale and environmentally detrimental projects (Estes 2019, McFarlane 2018). The ongoing presence of land defenders and protectors in Wet'suweten territory who are met daily with harassment from RCMP and Coastal Gas Link workers is a current and ongoing embodiment of these colonial dynamics and strategies (Dhillon 2019).

Defining and practicing Anti-Oppressive Research

Anti-oppressive research is an ethical framework that informs actions and recognizes that there are political and social impacts and implications to the research we carry out (Talaga 2018, Tuhiwai Smith 2012). While easily defined, putting anti-oppressive research into practice requires a "commitment to social justice and taking an active role in that change" (Brown and Strega, 2015 p.17). In order to engage anti-oppressive research methodologies in meaningful ways it is important to develop critical self-awareness as a researcher about how informed you are about historical and ongoing impacts such as colonization and how these impacts influence the research paradigm in the communities you work with. An increased awareness and education can then inform how you identify and mitigate aspects to your research such as: power dynamics, retraumatizing, upholding colonial narratives and acting in oppressive ways. All of these can be enacted unknowingly, thus requiring ongoing conscious self-evaluation (Figure 1). The following figure provides a point of reference for some of the key aspects and processes of setting out to create anti-oppressive research.

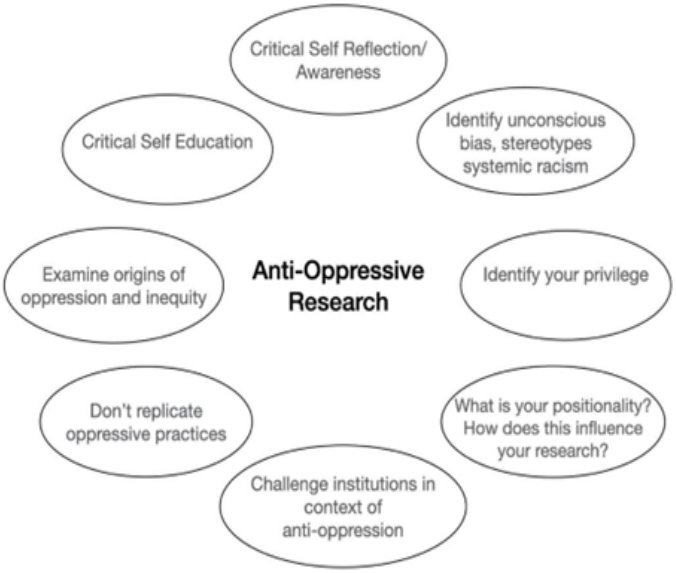

Figure 1. A cyclical reference point chart for considerations and self check-ins when developing anti-oppressive research processes. These steps can be applied to all stages of research from initial planning through to delivery of results and deliverables. Developing deeper awareness at each step will support the researcher to continually self-assess and consider if they are truly engaging in anti-oppressive research.

This diagram is meant to offer a tool to support and foster ongoing critical self-awareness and lead to carrying out anti-oppressive research projects from start to finish. Each of the eight stages of the diagram, discussed below, is meant to be an entry point so that researchers can jump in at

any place and reflect on how that particular question or statement pertains to a certain stage of their research.

Critical Self Reflection/Awareness
This is an ongoing and iterative process that bridges both personal and professional reflections with the aim of becoming more critically aware of the impacts, influence and responsibilities you have as a researcher working with Indigenous or other BIPOC communities. This is vital, as people in those communities may have trauma related to colonization, systemic racism and the cumulative, ongoing impacts from these factors. A starting point in this process may include, for example, reading Indigenous and BIPOC literature on related topics, learning about the colonial history in the area where you are conducting research, reading books and/or listening to podcasts on anti-racism and decolonization, and speaking to peers who may be engaged in similar processes. Furthermore, institutions or other workplaces increasingly have resources in place to support this process of critical self-reflection and cultivation of critical self-awareness.

Identify Unconscious Bias, Stereotypes and Systemic Racism
Racism is an ideological construct rooted in Eurocentric worldview and experience designed to uphold beliefs in white superiority and to justify inequality between people of color and dominant white society. Racism assigns the blame and judgment to the very people shouldering the associated discrimination, violence and inequality. Unconscious bias are the learned stereotypes that are automatic, unintentional, deeply ingrained, and can influence one's behavior. Embodied, unconscious bias can work below the level of discourse and can frame the dispositions of both individuals and nations. Countering this requires developing one's engagement with, and understanding of, these factors is key in order to move through the rest of the steps and in order to address how an increased awareness may influence research related thought processes and planning.

Identify your Privilege
Privilege is a right, immunity or benefit enjoyed by a person beyond the advantage of most. Privilege is an unearned advantage. There are different types of privilege and without careful consideration it is possible to be unaware of the privilege you may hold. Once privilege is identified it is possible to mobilize your privilege for good and to the benefit of the communities you are working with.

What is your positionality? How does this influence your research?
A term used to describe and delineate one's position in relation to others, including research participants (Heaslip 2014). Positionality includes consideration of the intersections an individual has with regards to cultural identity/race, gender, social class and ability. Understanding one's positionality requires that we understand what privilege we carry, what biases we have and how these factors contribute to our beliefs and behaviours as individuals, educators and researchers.

Challenge Institutions in the Context of Anti-oppression
Institutions are built on colonial context and foundations. In order for institutions, such as universities, to work towards anti-oppressive approaches to their programs, classes, labs, field schools and more, it is essential to understand that this process is action-based. Neither anti-

oppression, indigenization or reconciliation can be considered as purely theoretical (Simpson 2004, McFarlane 2018, Smith 2012).

Don't Replicate Oppressive Practices
Either unknowingly or knowingly it is possible that through research-related actions, decisions and processes that a researcher may uphold oppressive practices or dynamics. Examining inherent power dynamics that exist in with researcher/participant interactions and working to mitigate these dynamics is one way to avoid upholding oppressive practices in a research setting.

Examine Origins of Oppression and Inequity
Doing your own background research and education on the histories of oppression and inequity in the regions where you are conducting your research is critical in understanding how to be critically self-aware and subsequently ensure you are not causing harm or upholding oppressive behaviors or narratives.

Critical Self-Education
This is the process of educating yourself in a meaningful and in-depth way about how all of the factors in this diagram influence who you are as a researcher and how to challenge yourself to be as critically self-aware as possible when working with Indigenous and other BIPOC communities.

Decolonial and Strength-based Research Strategies in Indigenous communities
Having defined a practice of anti-oppressive research, we next integrate two research strategies that are complementary to, and contribute to, anti-oppressive research. These methods—decolonial research methods and strength-based approaches—work together to advance research towards inclusivity and help to build critical self-awareness and dismantle colonial and oppressive research dynamics. It is from this place that ethnobotanical research can contribute to critically informed research that is empowering and highlights resilience within Indigenous communities as well as ancestral plant knowledge. Decolonial research methods seek to ground action in opposition to colonial histories, structures and ideologies. Through enacting decolonial methods, researchers can seek to empower Indigenous individuals and communities and support self-determination. Decolonization can be understood as the bureaucratic, cultural, linguistic and psychological divesting of colonial power (Smith 2012). Decolonization restores Indigenous worldview and culture and replaces Western interpretations of history with Indigenous perspectives of history.

Strength-based approaches to research are rooted in a "social work practice theory that emphasizes peoples' self-determination and strengths and are increasingly being applied beyond the field of social work. These approaches do not set out to fix a problem, but rather to create an opportunity to explore the strengths and capacities individuals might have in the process of taking control and learning" (Kelvin et al 2020). Some key aspects for this approach that were outlined in a paper that explored taking strength-based approaches to working with Inuit youth in the context of archaeological research:

1) focusing on the whole person and recognizing their social context;
2) actively involving participants in decisions;
3) recognizing strengths and expertise of participants so that everyone is both a teacher and a learner; and
4) encouraging experiences where group members can be successful (Kelvin et al 2020).

Taking strength-based approaches in the context of ethnobotanical research is a meaningful way to engage in collaborative co-creation of ethical and meaningful research that contributes to the Indigenous communities involved. Researchers should be careful to avoid paternalistic motivations or behavior and be fully prepared and committed to co-create a research project with a particular Indigenous community and know that it is not a 'one size fits all' model of research and that this methodology will lead to differences across research in different Indigenous communities. Taking a strength-based approach is not about ignoring weaknesses or ongoing challenges within the communities we work with but instead it is about shifting power dynamics and upholding a responsibility to carry out anti-oppressive research that empowers Indigenous communities towards research self-sufficiency and data sovereignty (Gaudry 2015, Kukutai and Taylor, 2016, Rainie et.al, 2018).

Integrating Anti-Oppressive, Decolonial and Strength-based Approaches
The following sections offer context and examples for taking action-based approaches to decolonizing ethnobotanical research and teachings. Each of these sections explore ways that highlight and integrate the strength and resilience of the communities we work in collaboration with. This list is not exhaustive, and it focuses on Indigenous communities, but it offers a starting place for considering the larger social and political responsibilities we carry as researchers who are working alongside BIPOC communities or organizations in general.

Indigenizing Botany & Ethnobotany
The origins of both botany and ethnobotany as fields of study are rooted in colonial power structures and extractive and exploitative research ideologies and methodologies (Geniusz 2009). In many cases, western botanical and ethnobotanical research were made possible with the exploitation of local labor, the claims of "discovery" of botanical species that have been known and utilized by Indigenous Peoples for thousands of years and the erasure of Indigenous voices, language, taxonomies and histories of long-standing relationships with plants and their associated ecosystems (Kimmerer 2013, Simpson 2014). The original definition of ethnobotany coined by John Harshberger in 1896 "the study of the plant use by *primitive* peoples" along with his perspective that "*The well-known classification of men into savage, pastoral, agricultural and civilized will roughly serve our purpose"* demonstrates the direct colonial underpinnings of the genesis of this field. There is a growing awareness of the responsibility all ethnobotanical and ethnobiological researchers hold to build meaningful foundations of trust with Indigenous Communities who feel they have been "researched to death" (De Leeuw et al., 2012, Harshberger, 1896). The problematic aspects of the origins of these fields of study can inform the responsibilities that botanists and ethnobotanists carry to educate themselves and shift practices within their respective fields to align with decolonization and furthermore to look towards supporting Indigenous, and other BIPOC, experts and researchers in these fields.

It is possible to find common ground through some theories, methodologies, and processes that are studied as part of the fields of botany and ecology that also have traditions in Indigenous communities. For example, understanding the life cycle of a plant and how it connects to the larger ecosystem, contributes to the development of knowledge and expertise required to engage cultural management strategies that alter the productivity and success of culturally important plant species. Many culturally important plants respond well to Indigenous management practices that optimize disturbance, such as digging up and replanting the vegetative bulblets of lhásem (*Fritillaria camschatcensis* L. Ker gawl) to increase productivity of the bulbs, prescribed burning of spananewx (*Camassia* spp.) to enhance soil quality and stave off succession and coppicing culturally important tree species such as Pacific crab apple (*Malus fusca* (Raf.) C.K. Schneid) to enhance the productivity and ease of harvesting (Beckwith 2004, Joseph 2012, Turner 1999).

Indigenous Plant Science

Indigenizing the fields of botany and ethnobotany are processes of adapting and adjusting systems and infrastructure grounded in western knowledge and institutions whereas Indigenous plant science is a long-standing, relational system of knowledge and wisdom grounded in land-based and place specific knowledge (Cuerrier et al., 2015) and lived experience, ceremonial practices, experimentation, cultural plant management, in-depth understanding of plant life cycles and relationships to pollinators, and differing seasonal conditions. I offer that the term Indigenous plant science encapsulates the system of knowledge that pre-dates colonization and does not rely on western scientific paradigms or epistemologies but does overlap and align in ways with western botany and ethnobotany.

Language offers tools along the path towards indigenizing and decolonizing the fields of botany and ethnobotany. There are Indigenous names for plants, cultivated landscapes, words for certain parts of plants utilized at certain times in the season, names for specific harvesting areas and words that express the interrelationships that plants hold with people, animals and pollinators. Some examples from the *Sḵwx̱wú7mesh Sníchim* or Squamish language are as follows; the word for April is *tem tsá7tsḵay* which translates to “when salmonberry shoots are collected” May is *tem yetwan* or “the time when the salmonberries ripen” or July is *tem ḵw’élemew* meaning “the time when the blackberries ripen” August is *tem t’áḵa7* translates to “when the salal berries are ripe” the word for plantago spp is *slhí7lhawíń tl’a wex̱és* or “little bed of the frog”. There are place names as well like *T’ekw’t’akw’emay* that translates to “place of many thimbleberry bushes” at the mouth of Evan’s Creek at an ancestral village site, *Ch’etch’at’iyay’em* translates to “place of lots of Devil’s Club” and corresponds with an ancestral harvesting site. The place-based cultural information that is embedded in language can teach us and guide us in how to reconnect to plants and the land.

The following figure is an Indigenized life cycle diagram for wild rose, in this case *Rosa nutkana* C. Presl. Increasing the representation and reclamation of Indigenous botanical knowledge and integrating it into existing educational tools can draw Indigenous students into the conversation and can make Indigenous students feel they are reflected back in the area of study. Figure 2. is an illustration by Indigenous artist Sarah Jim from WSANEC First Nation that incorporates the Squamish language and the stages in the life cycle where cultural relationships are enacted.

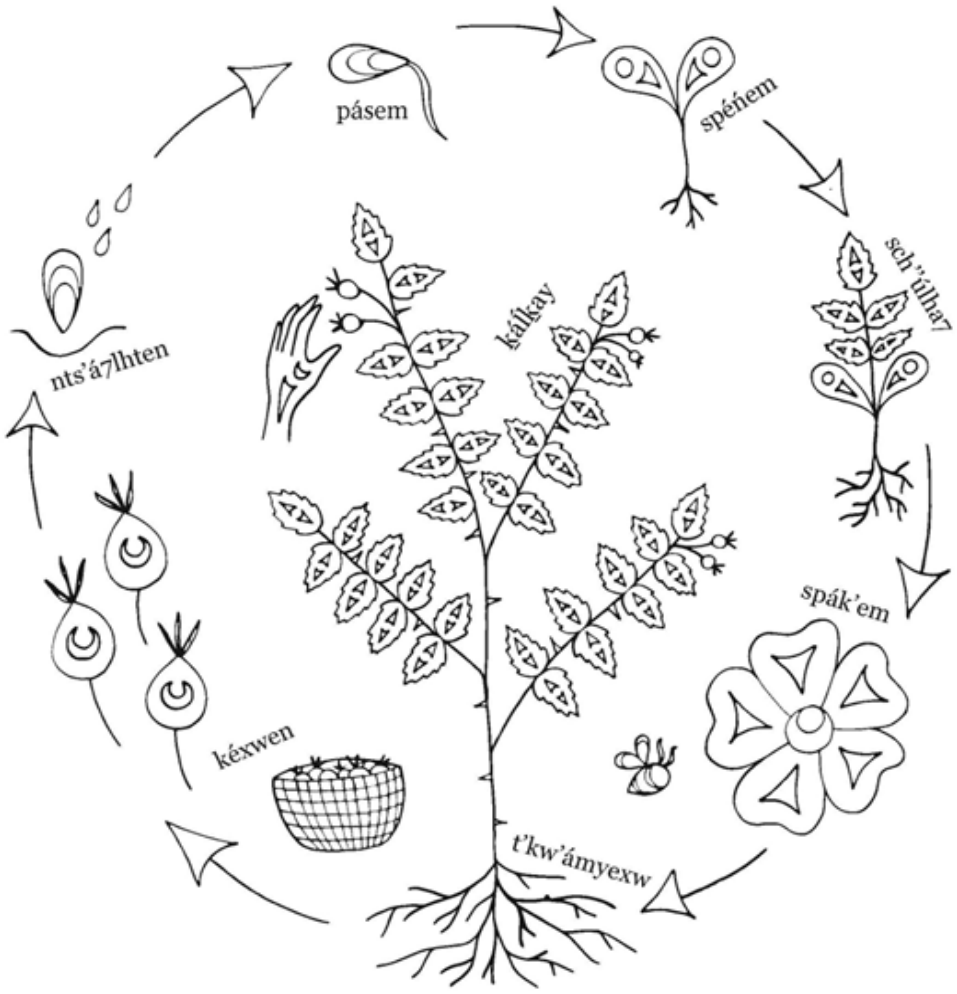

Figure 2. ḵálḵay (wild rose) lifecycle diagram. The diagram shows the prominent stages of development from seeds to mature wild rose bush. 1. nts'á7lhten = seed 2. pásem = Just starting to sprout 3. spéńem = Plant 4. sch''úlha7 = Leaf 5. spák'em = Flower 6. t'kw'ámyexw: root 7. ḵáĺḵay = wild rosebush 8. kéxwen = to pick (berries). Steps 5 shows the relationship between pollinators and the flowering stage of the plant. This is important for cultural knowledge as when the rose petals are harvested for medicine there is a practice of leaving 2-3 petals on each flower to allow for pollinators to still land. Step 8 shows a culturally significant relationship with ḵálḵay (wild rose) when the rosehip fruit is ripe that is when they are harvested for food and medicine. Drawn by artist Sarah Jim Emerging artist from W̱SÁNEĆ First Nation (Coast Salish).

Indigenous plant science does not need to be fit into or validated by western botany and ecology—it stands on its own—but insights and knowledge from both systems can be intertwined in meaningful and culturally respectful ways to enrich one another (Geniusz 2009, 2015, Kimmerer 2003, 2013). After all, both Indigenous plant science and western ecology and botany share at their core a love for plants and a driving curiosity for how to be in relationship with our botanical relatives even though this is not how plants may be perceived through the lens of western sciences. No matter where we come from we all have personal, historical, and ancestral relationships with plants that go beyond the purely scientific.

Anti-Oppressive, Decolonial and Strength-based Approaches
The following sections address action-based ways to address aspects of community-based research to follow anti-oppressive, decolonial and strength-based approaches to research with Indigenous communities.

Supporting Indigenous Research Self-Sufficiency
Part of enacting change and decolonizing ethnobotany is shifting power dynamics in a research setting. Metis scholar Adam Gaudry (2018) writes about the responsibility of researchers to contribute to supporting the goal of Indigenous research self-sufficiency in partnering communities. Research self-sufficiency is the next step beyond community-engaged research and can be supported in numerous ways by researchers that prioritize and centralize the most pressing issues and topics within the community. This means supporting partnering communities in taking not only a more active role in co-developing and co-creating meaningful research within their home communities but moving towards being able to carry out Indigenous-led community-engaged research for their communities by their community members. By prioritizing Indigenous research collaborators in projects within Indigenous communities this ensures a different level of lived experience and visceral understanding of the impacts on land-based knowledge, including plant knowledge and cultural practices and offers a different lens for research to be envisioned through and carried out from beginning to end (Joseph and Turner 2020, Armstrong 2019).

Increasingly, as more Indigenous researchers emerge and step into academic and research positions, a move towards Indigenous research sovereignty becomes possible. Many Indigenous communities already have research protocols and ethics approvals in place and achieving research sovereignty does not mean excluding non-Indigenous researchers — it means that Indigenous communities would have complete agency and independence in who they wish to collaborate with and why and how. Ironically, Indigenous communities have become some of the most studied peoples but their invisibility and marginalization has been upheld through a history of extractive research and what Indigenous scholar Shawn Wilson terms “salvage research,” originating from the belief that Indigenous cultures would soon disappear and thus it was the role of the researcher to document Indigenous cultures before they went extinct. Salvage research is disempowering, othering, exclusionary to Indigenous peoples themselves and upholds erasure of Indigenous voices and Indigenous people on the land (Wilson 2008).

Indigenous Data Sovereignty
Data is the currency of research. Decisions about what data to collect, how to collect it and how to analyze it and for what purpose lie in the hands of the researcher thus it is essential to consider data when taking anti-oppressive, decolonial and strength-based approaches to research. Data is not neutral (DeLeeuw et. al., 2012, Kukutai and Taylor, 2016). Throughout the research process, from hypothesis to publication, the researcher is making decisions based on their lived experience and how they view the world. Until recently, research with Indigenous populations has been conducted solely by non-Indigenous researchers. As such, most research is not conducted within the framework of Indigenous worldview, but within dominant discourse coming from outsider views and interpretations. This has, and continues to, produce disturbing trends in data acquisition and interpretation involving Indigenous Peoples (Rainie et al, 2017). These trends reflect stories that the larger society often reflect back to Indigenous populations

and those are often stories of deficit, trauma, disparity, dysfunction, disadvantage and deprivation (Walter and Suina, 2019). Data can act as yet another layer of dispossession for Indigenous peoples, the dispossession of autonomy of voice, perspective and worldview, this can be likened to someone commandeering your story and telling their own version based on what they perceive and understand about your story but through the lens of their lived experience. In recent years a strong movement towards advocating for Indigenous Data Sovereignty has been championed by Indigenous scholars (Smith 2012). This is a movement towards the empowerment of Indigenous Peoples to have self-sufficiency and eventually sovereignty when it comes to data that is collected from their communities. In a recent paper, three steps to establishing data sovereignty in Indigenous communities were outlined, they are as follows:

1. Cultivate technical skills among community members related to survey development, data collection, analysis, and reporting.

2. Build comfort and understanding regarding research methods among tribal partners.

3. Advocate for Indigenous research methodologies and Indigenous data sovereignty (Walter and Suina, 2019).

Indigenizing Quantitative Methodologies

There are many ways in which quantitative methodologies can be Indigenized by Indigenous students and researchers from the very first research design framework through to planning methods, data collection, analysis and what problem the research is addressing. For example, if you consider a non-Indigenous scientist who is interested in determining the habitat of a particular plant this person will follow the scientific method to state their research questions and then develop and follow an objective research methodology, use data analysis to gain insights and discuss the results in the context of the greater query in order to contribute to the literature and scientific understanding of this species. For an Indigenous scientist interested in the same plant, these same topics will be of interest to them as well, however, that plant may reside within a landscape that is storied within a larger web of ancestry and kinship (Kimmerer 2013, Salmón, 2000). That plant might be considered a relative that deserves respect and reciprocity. The habitat might be highly altered and reflect colonial impacts to the environment around this plant. This Indigenous researchers' relations were likely forbidden to tend to or harvest that plant at some point in time and these factors create a different lens for carrying out ethnobotanical research. All of these potential factors will shape the questions that this person makes and how the data will be collected and analyzed and how the results will be disseminated.

Carrying out Respectful Ethnobotanical Research

The appreciation for Indigenous botanical and ecological cultural information in an academic setting needs to be grounded in the critical context that acknowledges the impacts on this knowledge as well as actively finds ways to mitigate ongoing damage. This opens up opportunities to focus on empowering local communities, Indigenous researchers and collaborating in meaningful and reciprocal ways through ethnobotanical research. This approach also recognizes and respects the fact that Indigenous knowledge does not need to fit into Western paradigms but instead exists independent of this.

As researchers in these fields there is an opportunity for recognizing one's privilege[1] and how to activate this within a community-based research context to do good and contribute in a positive way to the greater work of cultural knowledge renewal.

Building Reciprocal Research Relationships

A good starting place for building reciprocal research relationships is finding meaningful ways to give back to the Indigenous communities we work with. Figure 3 shows a cyclical diagram that can be utilized as a reference for considering the various ways to give back to the Indigenous communities you work with.

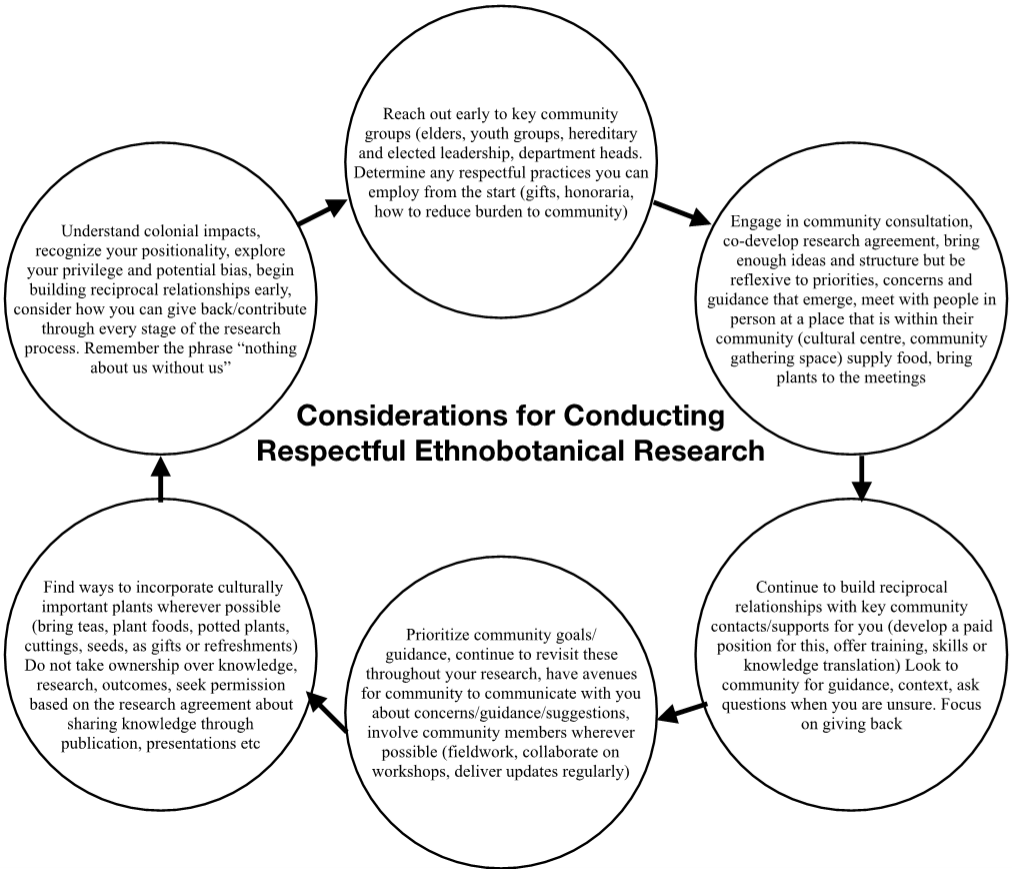

Figure 3. Cyclical diagram that guides respectful and reciprocal research considerations and decisions throughout the research process. This diagram is meant to provide reflection at various stages for researchers to self-evaluate throughout the research process.

As ethnobotanists we have a responsibility to ensure our work contributes to the knowledge renewal and rebuilding of cultural plant-based relationships in Indigenous communities. This responsibility does not always line up conveniently or easily with our research and funding schedules and it is important to note that the process of building reciprocal relationships within community can be challenging and lengthy at times. However, these efforts are fundamental in

moving the field of ethnobotany towards indigenization through engaging in anti-oppressive, decolonial and strength-based approaches to research.

Some science-specific ways to make the fields of botany and ethnobotany more inclusive from an early age are developing science-based programs aimed at Indigenous youth, creating more inclusive resources such as textbooks that integrate Indigenous botanical knowledge and practices, including Indigenous plant knowledge into books and science magazines aimed at youth. Secondary and post-secondary educational institutions can apply an indigenized lens to the scientific method, develop grants and scholarships aimed at supporting Indigenous students in pursuing these areas of study, and indigenize ecological and botanical concepts.

The process of indigenizing these fields extends to prioritizing Indigenous hires for tenured positions and for direct involvement within scholarly societies and. In effect, individual ethnobotanists, and the discipline more broadly, must work within their departments, institutions, and professional organizations to enact the decolonization and indigenization of these fields. The roots of these areas of study not only involve species and ecosystems that have been culturally managed for thousands of years but it is also important to remember these disciplines often have histories of extractive and damaging research with Indigenous populations that require reparations.

The preceding sections laid out action-based approaches to decolonizing and indigenizing the fields of botany and ethnobotany. The intention of these sections together is to create a pathway to the decolonization and indigenization of the fields of botany and ethnobotany that can be considered and adapted for working within an Indigenous context and in turn support more Indigenous researchers and practitioners to enter into and thrive in these fields.

In the next section we turn to a case study of community-based research that demonstrates anti-oppressive, decolonial and strength-based approaches to ethnobotanical research. This case study exemplifies the pathway to decolonizing and indigenizing a community-based research project. The author and primary researcher, Leigh Joseph, will write the section in the first person. Leigh's Indigenous ancestry is central to the way that she approached this project with her community from the very beginning and through every step along the way. The process of renewing cultural plant knowledge is a personal one as well as an academic endeavor. For these reasons this section will be written largely in first person narrative from Leigh's perspective as a Squamish community member and as a researcher.

Squamish Case Study

Over the past fifteen years, I, Leigh Joseph, have been working in community-engaged ways with my home nation, and other Indigenous communities, on the renewal of cultural plant knowledge and practices. This area of research has been dominated by non-Indigenous practitioners and I felt it was essential to have more Indigenous voices in the literature and developing community-engaged research methodologies and frameworks. I am currently in the process of completing my doctoral studies and I will include a case study from my work in my home community of Squamish to illustrate how strength-based approaches were implemented throughout this process.

The objectives for the community-engaged research case study were:

1. Through taking a process-oriented approach, exploring, identifying and highlighting actions for taking strength-based, decolonial and anti-oppressive approaches to ethnobotanical research.

2. To contribute to the resurgence of knowledge, hands-on learning and harvesting practices of traditional plant foods, medicines and materials in the context of health, in the *Skwxwú7mesh* First Nations community.

Initial Stages of Research in Squamish

In 2017, I took on the role of an Indigenous research liaison in a national research project funded by the Canadian Institute for Health Research (CIHR) focusing on the prevention and management of Type 2 Diabetes in four Indigenous communities in Canada. The principal investigator, Pierre Haddad, is a tenured professor in the Department of Pharmacology and Physiology at the Université de Montréal. Each community went through an initial consultation, and then a community planning committee was formed. In Squamish, this committee had representatives from the Squamish education, health and recreation departments as well as members of chief and council. I had the opportunity to pursue my doctoral studies in collaboration with this project. Part of my role as the research liaison was to consider how to make connections and partnerships within the community.

Process-Oriented Approach

The decision was made to intentionally take a process-oriented approach to this community-based research project from the start which meant that we worked towards making culturally relevant improvements to our methods, resisted the dogmatic aspects of the disciplines of botany and ethnobotany, and involved co-discovery with community partners. Taking this kind of approach was critical to both the academic and the on-the-ground community work in ways that allowed for more co-creation, reflexivity and meaningful engagement throughout the project.

Research Site and Design

The traditional territory of the Squamish People encompasses broad geographical and ecological diversity, including: rugged mountain peaks, alpine ridges, deep river valleys, temperate rainforest, extensive wetlands, island archipelagos and expanses of coastline. This dramatic landscape lends itself well to the many land-based stories that describe the origins and history of this rich territory. The territory spans from Khatsahlano (Kitsilano), through West Vancouver to Skwxwú7mesh (Squamish) and further north, past the town of Pemberton. The Squamish People, Skwxwú7mesh, are part of the larger Coast Salish cultural and linguistic group (Suttles, 1990). Today Skwxwú7mesh people live in nine communities throughout their territory that encompassed 23 village sites in the past.

In Squamish, the planning committee and I decided, with community input, that holding a one-year pilot program to offer land-based and hands-on learning with plants was our approach to meaningful research that addressed the community priorities identified by previous input. We based this decision on a previous in-depth community planning research project titled “Avenues of Change” which indicated connecting to knowledge of cultural plants was a community

priority and an area of knowledge where ongoing barriers exist. From the very early conversations about this research project through to the implementation and now the analysis and upcoming dissemination, I have worked with guidance from my community and in close partnership with those who participated in the one-year pilot project. This ongoing and recurrent community engagement resulted in a shared learning experience that was co-created with all that participated and was reflexive by nature due to the process-oriented approach to the research. The following sections define the key parameters and practices that we enacted through the project.

Methodology

I worked with a small team of co-facilitators with backgrounds in anti-colonial methodologies and plant-based health and wellness to plan the one-year land-based community plant project. We followed Community-based Participatory Action Research (CBPAR) principles which centralize the voice of the community and knowledge holders in all research phases, from design to publication (Kimmerer, 2013; Oyserman 2007; Schnarch 2013). We conducted consultation meetings with the Squamish elders, members of the Squamish Nation education, recreation and health departments and students and teachers at Cultural Journeys, a Squamish Nation led K-6 school program. We planned a one-year land-based and hands-on program to learn about and reconnect to culturally important plants. We structured the program to follow the seasons and in each season we included learning about plants that either were harvested or utilized within that season. The following figure shows the flow of the project with some of the seasonal activities we facilitated:

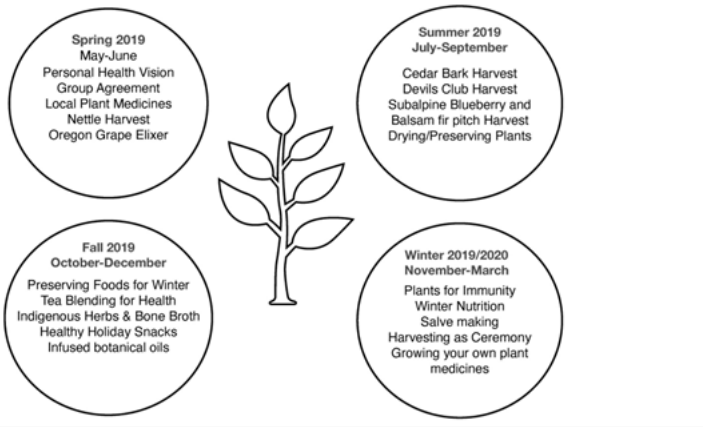

Figure 3. Shows examples of some of the community-based and land-based programming we planned for our one-year plant project in Squamish. These activities were complemented with weekly in person meetings at the community hall and seasonal workshops to delve deeper into the cultural plant knowledge with the context of our pilot program and exploring the links between health and plant foods and medicine.

Strength-based Approach in Skwxwú7mesh Territory

Taking a strength-based approach to our research project meant following the steps listed below:

1. Framing our recruitment for participation in ways that were accessible, inclusive and grounded in Sḵwx̱wú7mesh ways of knowing.

2. Removing barriers to participation which meant we completely subsidized any cost associated with the program, we planned options for verbal engagement or support with any written aspects of the program and considered mobility when choosing sites for land-based programs.

3. We consistently followed a co-creation model within our group and made space for ongoing conversations and check-ins to ensure we were hearing from participants and that we all felt we were reflected in our shared experiences.

4. We followed a process-oriented research approach which allowed us to be responsive and reflexive to our changing context and environment. This became particularly important with the onset of Covid-19 and how this changed our research project.

5. We structured our one-year land-based pilot project around a Sḵwx̱wú7mesh seasonal harvest so that our discussions, programming and frameworks were grounded in what it means to live in Sḵwx̱wú7mesh territory and in relationship with the land and the different life cycles of the culturally important plants we learned about and harvested.

6. We planned as many land-based and hands-on learning opportunities as possible and this planning was informed by the seasonal round scheduling and also the priority learning areas identified by our group.

Data Collection:
This project is ongoing, but the data collection consists of harvest surveys that were filled out and collected in the field after our land-based sessions, focus groups and community engagement activities which were facilitated as part of quarterly community meetings which were designed to collect data in interactive ways and offer opportunities for feedback and reflexivity within our program. Over the course of the one-year pilot project we facilitated land-based and hands on sessions to explore botanically grounded ways to reflect on our experiences as individuals and collectively. Table 1 lists some research activities we engaged our community participants and co-creators with and how each activity ties into anti-oppressive, decolonial and strength-based research.

Table 1. Community-based research activities for exploring cultural relationships with plants and priorities for how to rebuild relationships with plants in a Squamish context.

Research Activity	**Anti-oppressive Aspects**	**Decolonial Aspects**	**Strength-based Aspects**
Harvesting surveys (blueberry harvest, Oregon grape, Devil's Club)	-surveys were administered in the field with the option of a facilitator assisting to record answers -surveys were in connection culturally important plants identified by the group	-harvest days started with a cultural blessing and grounding activity -plants are considered relatives and this relationship shaped our land-based sessions -each person did an offering for the plants they were harvesting in	-we asked the community members participating to identify what plants they were most interested in and what aspects of plants they would like to learn about -we drew on our group to co-create the plans for our field days

	as high priority species to learn about -we discussed the surveys and how to make them the most useful and aligned with our group before developing them	the form of a prayer, song, tobacco or another gift of reciprocity that was chosen by them	-we grounded our teaching and conversations about plants in culture, strength and resilience
Rosehip activity - Community members wrote qualitative information on strengths and challenges accessing traditional plants and medicines. The activity was recorded on a drawing of a rosehip, a culturally important food and medicine, strengths were written on the fruit and the challenges on the stem and thorns (March 2019, May 2019, Sept 2019, Feb 2020)	-we grounded the activity in Squamish epistemology -we had facilitators who could help participants fill out answers if they were not comfortable writing -we clearly explained that the perspectives of the participants was valued and unique	-by choosing a rosehip as a format for inspiring reflections on challenge and positives we started the conversation from a place grounded in Squamish plant relationships -We adjusted our methods of collecting information to include oral responses that we could document -we co-created the group activities based on the group interests and priorities	-this activity met people where they were at, they didn't need to have prior knowledge, they were sharing their lived experience and their hopes and desires for how to empower their lives with more access to plant foods, medicines and knowledge
Salmonberry activity Our group explored and recorded qualitative information on what the hopes and dreams of participants was for their ideal future in accessing plants and medicines (March 2019)	-we set a foundation of speaking as a group about the impacts on plant knowledge and access so as to honor the resilience embedded in the knowledge renewal work the group was engaged in	-we were mindful of assessing power dynamics to strive towards having a co-created experience with our group instead of a top-down approach to facilitation and discussion	-we focused on aspirational goals and visions for accessing and incorporating plants into the lives of the participants

Baskets + paper bag plant prioritization activity – This was a participatory activity in which we asked what kinds of quantitative and qualitative information on plants community members wanted to learn about and access more (May 2019)	-this activity was held at a community plant celebration and thus was grounded in goals and aspirations for reconnecting to plant knowledge -this was an optional activity and was set up with a series of baskets with photos of plants with the Squamish names written on them. People had the opportunity to add notes into baskets for plants they were particularly interested in and also for people to share plants, other than the ones on the list, as ones they would like to learn about	-plants were labelled in their Squamish names with photos and common and Latin names included underneath the Squamish name	-this activity gave everyone equal opportunity to contribute to the selection of top priority plants in this research project -this allowed us to gather insights and guidance from our participants
Medicine wheel activity -One of our community members and participants helped facilitate this activity to gather qualitative information/reflections from participants on how their life is aligning with their health vision so far, setting goals in physical, mental, emotional, and spiritual areas for the rest of the program's duration (Feb 2020)	-we started our program with a health visioning activity that supported people to outline their own vision of their health and goals in the context of our program -grounding the health vision in individual experiences and goals centralized the participants themselves	-we chose the medicine wheel as a framework for this activity as our participants generated these ideas in one of our sessions -we had one of our participants facilitate this activity as they felt empowered to mobilize their training in working with the medicine wheel and this shifted the researcher/participant power dynamics	-the medicine wheel approach is holistic in nature and highlights a strength-based approach by meeting people where they are at and setting up a framework that is positive and supportive

The feedback from our various activities broadly fell into eight categories:

1. Connections to traditional plants, foods, and medicines;
2. Education;
3. Coordination, workshops, and supports;
4. Tools and resources;
5. Physical activity;
6. Mindset;
7. Social connections; and,
8. Environment and territory.

I will highlight the results for the education category here as an example of the feedback we received as part of this facilitation and as an example of where the field of botany can contribute positively to rebuilding Indigenous relationships and knowledge of plants:

Education
Many participants are looking for broader education on skills and knowledge such as how to identify traditional plants and medicines, where to go to harvest them, and how to sustain them for future generations.

What's working: There is some knowledge in the community that can support this process, and people are learning from knowledge keepers and elders.

Challenges: There's a general lack of harvest knowledge, specifically challenges around the knowledge of where to go, what spaces are safe for harvesting, how to properly identify plants, how to gather plants, and how to harvest sustainably (e.g., what the limits are for gathering plants without harming the plants' survival, how often to harvest and when).

Being able to draw on participant guidance and feedback gave us a chance to be reflexive through the course of the community-based on the land plant knowledge renewal program we were co-creating with our group of community members. Some key considerations that came from this pilot project were to check in often with the group, build in time/capacity for reflexivity, center the community members in the project at all times, bring together a community advisory group to turn to for guidance throughout all stages of the project. Though it may feel daunting to centralize community member's experiences and feedback over funding deadlines and other external factors, this is a truer path to engaged anti-oppressive research and will likely require you to advocate for the community within your institution so as to create the space for meaningful changes to how we conduct community-based ethnobotanical research.

Discussion
Taking a one-year land-based approach to reconnecting to traditional plant knowledge was a very positive and practical way to engage our community participants and learn from our group and also from the land (Battiste, 2013; Kimmerer, 2013; Simpson, 2017). By modeling the flow of our research project on the seasons we were able to connect to Squamish territory and identity throughout the program. Our results from the harvest surveys and the community engagement activities showed us that we were addressing an area of great interest and that there is much more

work that can be done to support the processes of knowledge renewal in connection to culturally important plants. Some priority areas we identified were: creating resources to aid in continuing to rebuild relationships with plants including plant identification, sustainable harvesting/growing/propagation protocols, recipes for how to reintegrate plant foods and medicines into daily life. Many of our community participants identified having a program that was grounded in Squamish culture and landscapes and had space for co-creation and reflexivity was important for their engagement, inspiration, motivation and cultural safety.

COVID-19

Our one-year program was disrupted with the onset of Covid-19 and we had to stop our in-person gatherings and facilitation which disrupted our group time on the land. During this time of great uncertainty and upheaval we consulted our participants and the community research committee, and our community participants, and it was decided that our team would turn our focus to preparing a plant book that incorporated information on plant identification, habitat, cultural relationships and recipes for how to utilize plants as food and medicine. We are currently finalizing this book and will distribute to key community partners in the Squamish Nation including our planning committee, our participants, the cultural journeys school program, the elders program, the healthy families program and we will offer virtual and written opportunities to give feedback on the plant field guide and plant recipe sections. The recipes include both topical preparations such as salves, infused oils, bath soak blends and food recipes that look at incorporating Indigenous plants into healthy, straightforward recipes to support health. Throughout our program we integrated anti-oppressive, decolonial and strength-based approaches to all of our sessions, discussions and land-based experiences and this allowed us to create a safe and inclusive space where the community participants felt at ease, heard, valued and engaged. Taking a process-oriented approach allowed for us to continually reassess our programming and adjust based on the groups feedback.

Significant Learnings

The following are some of the major takeaways from our program:

1. Follow cultural teachings. Each of our group sessions started and ended with a circle which was one of the cultural protocols that our participants advocated for and that we incorporated from the start. This practice led to people feeling comfortable and grounded during each session.

2. Leave ample space for conversation and reflection. All of our sessions had specific time built in for participant-led conversations and reflections. This evened out the power differential between the facilitators and the participants and created an environment where we were all learning from each other.

3. Spend as much time on the land as possible. The land-based sessions were by far the most valued sessions by our participants. Shifting learning out onto the land is a profound way to teach about, and reconnect with, culturally important plants.

4. Bring culturally important plants into learning spaces as often as possible. Some examples of this are, bringing in potted plants so people can become familiar with

plant identification, bringing in dried plant ingredients and blending tea, you could bring in beautiful colour photographs of plants, make a salve or infused oil with plant ingredients. All of these acts help to rebuild relationships in experiential ways.

5. Learn to make things with plants. Our participants loved the sessions where we identified, harvested, processed and then made something with a particular plant. For example, during Oregon grape season we identified the plant in the field, spoke about the cultural relationships with the plant, sustainably harvested the fruit and then brought it back to the kitchen at the community hall and made and jarred Oregon grape concentrate to be used through the winter months and added to water or smoothies.

Future Directions

Our research demonstrated that there is an interest and desire to engage in more land-based opportunities to learn from culturally important plants (Kimmerer, 2002, 2013, Geniusz 2015**)** . Future research projects could build connections between existing programs and community organizations to share in the knowledge renewal and integrate the learning more broadly across the community (Cuerrier, 2012, Joseph, 2012, 2021, Simpson, 2017). Having more visual resources such as posters, seasonal harvest round diagrams, plant field guides and cards for use on the land would all contribute greatly to the community and would benefit future generations through supporting knowledge renewal. Continuing to utilize tools and the self-reflection prompts included in this paper for ensuring to carry out anti-oppressive, decolonial and strength-based approaches to research will contribute to cultural revitalization and knowledge renewal. Engaging community members from the start of the project and mobilizing the privilege we carry to both give back and contribute to drawing on the capacity in mindful ways within the community will further support the move towards Indigenous research self-sufficiency, data sovereignty (Guadry, 2015, De Leeuw et.al.,2012, Geniusz, 2009, Kukutai and Taylor, 2016). As ethnobotanists where do we go from here? Figure 1 and 2 in this paper can act as critical self-reflection tools that can be revisited throughout community-based research with different Indigenous communities and can provide a framework that can be added to throughout our careers as we strive to do better in the areas of anti-oppressive, decolonial and strength-based approaches to ethnobotanical research.

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Chapter 4: Wáts'iyus Harvest Basket Model: Turning to Ancestral Plant Knowledge to Develop Indigenized Strategies Towards the Prevention and Management of Type 2 Diabetes: A Sḵwx̱wú7mesh (Squamish) Nation Case Study

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Abstract
For millennia Indigenous Peoples across the world have upheld their health and wellness in direct connection to their ancestral lands and related land-based practices including cultivating and harvesting traditional plant foods. Culturally important plants have been, and continue to be, a central part of supporting Indigenous health. Type 2 Diabetes (T2D), and other chronic lifestyle related diseases, can be linked to the ongoing impacts of settler colonialism in Canada. The dehumanization and marginalization of Indigenous Peoples throughout colonial history translates to health disparities and inequities for Indigenous Peoples in Canada. Interventions for Type 2 Diabetes in Indigenous communities' risk being disempowering and upholding trauma narratives if they do not consider the contributing factors that colonization brings. This paper will focus on a case study from the Sḵwx̱wú7mesh (Squamish) Nation, the home community of the lead author, and outline a framework for integrating culturally grounded botanical approaches into the prevention and management of Type 2 Diabetes. This research was grounded within concepts from Community Based Participatory Action Research (CBPAR) and Insurgent Research. CBPAR integrates guidance and collaboration with the community at every step of the research process and demonstrates reflexivity throughout. Insurgent Research (IR), a term coined by Metis researcher Adam Gaudry, is motivated by "grassroots-academic collaborations that resituate Indigenous interests and values in an otherwise alienating research process" (Gaudry, 2015). The Harvest Basket Model presented here is one that centers Indigenous voice, perspective, and worldview. This model informs how ethnobotanical research can further the understanding of the colonial factors that influence the levels of Type 2 Diabetes in Indigenous communities and become part of the solution in supporting communities to reconnect to culturally grounded, land and plant-based health and wellness practices. The Harvest Basket Model is a tool that is designed to be applicable and useful to diverse Indigenous communities interested in incorporating plants into their health and wellness programs.

Authors' Positionality Statements
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Introduction

Overview: Type 2 Diabetes (T2D) is a consequence of colonialism and the attempted dispossession from land, culture, traditional foods and medicines and cultural knowledge. Plant foods, medicines and materials contribute significantly to Indigenous health and wellness. This paper will address the following question: *What role do culturally important plants play in developing community-based approaches to addressing Type 2 Diabetes that are rooted in Indigenous conceptualizations of health?* Section 1 provides foundational context on the existing scholarship around the social determinants of health, Type 2 Diabetes (T2D) in Indigenous peoples, and anti-colonial and decolonizing approaches in ethnobotany. Section 2 shares a case study on a community-based ethnobotanical research project in the lead author's home community of Sḵwx̱wú7mesh that provides a possible approach to Indigenizing ethnobotanical research. In Section 3, we present the Wáts'iyus Harvest Basket Model for community-based ethnobotanical research that offers a pathway to meaningfully addressing the T2D crisis in Skwxwú7mesh and other Indigenous communities. Finally, Section 4 offers reflections on future directions.

Section 1: The social determinants of health, Type 2 Diabetes in Indigenous peoples, and anti-colonial and decolonizing approaches in ethnobotany

Type 2 Diabetes: A Symptom of Colonization

Type 2 Diabetes (T2D) is an outcome of settler colonialism in Canada. Indigenous Peoples are among the most at-risk in Canada, with rates three to five times higher than the rest of the country (Bartlett et al. 2007; Hegele 2001). The disproportionate level of T2D in Indigenous communities is a socially-constructed issue, meaning levels of T2D are not simply due to genetic or life-style underpinnings specific to Indigenous People, but instead are in response to the cumulative effects of generations of multifactorial colonially-rooted trauma including but not limited to, the loss of access to traditional cultivation and harvesting areas and the imposed loss of connection to family, culture, language and land-based knowledge through the residential school system (Phillips-Beck *et.al*.,2019). Consequently, Type 2 Diabetes manifests in various long-term complications affecting the cardiovascular system, eyes, kidneys, and nerves, resulting in premature death, disability, and a compromised quality of life (Young et al. 2000).
Type 2 Diabetes was not prevalent in Indigenous communities until recent decades when the disease rose to epidemic levels. Today, Indigenous youth are at much higher risk than non-Indigenous youth to develop chronic diseases including T2D.

However, Indigenous youth who have had less exposure to trauma, or are more culturally connected, have lower prevalence and likelihood of developing chronic diseases including T2D (Phillips-Beck *et.al*.,2019; Young *et.al*., 2000). Food deserts, the cost of food in northern and remote Indigenous communities, and lack of cultural food security and sovereignty all pose

significant barriers to achieving and maintaining good health. Highly processed foods are high in sugar and fat and are generally cheaper to transport, they preserve longer, and as such are more readily available in many remote Indigenous communities. The prevalence of processed foodsis contrary to the fact that many Indigenous peoples consider food to be medicine, and these communities are aware that having a lack of access to culturally important foods and medicines is a direct barrier to achieving good health (Skinner et.al., 2013).

Colonialism and racism in the social determinants of Indigenous health

> *"We call upon the federal, provincial, territorial, and Aboriginal governments to acknowledge that the current state of Aboriginal health in Canada is a direct result of previous Canadian government policies, including residential schools, and to recognize and implement the health-care rights of Aboriginal people as identified in international law, constitutional law, and under the Treaties".* Truth and Reconciliation Commission of Canada Final Report *(2015:2).*

The view that health is solely dictated by individual biology has only recently shifted towards incorporating social circumstances and contexts, such as systemic racism and white supremacy, into understanding health and inequities. This shift has led to the development of a social determinants of health (SDoH) approach which has made it possible to have a more "contextually nuanced analysis" of the enduring health inequities experienced by Indigenous peoples relative to non-Indigenous peoples (Greenwood, De Leeuw and Lindsay 2018, p.1647).

In Canada, the identification of social determinants of health have been primarily Eurocentric in nature (Canadian Institute for Health Research 2019; Douglas, 2013; Anderson *et.al*., 2016). Since colonization, governments at the national, provincial and municipal levels have failed to recognize or meaningfully engage with Indigenous conceptualizations of health. Consequently, national health policies and interventions have often failed Indigenous peoples (Reading *et.al*., 2007).

Both historically, and presently, Colonization is arguably the most significant social determinant of health for Indigenous Peoples, impacting all aspects of health and wellbeing (Paradies and Yin, 2016, Health Canada 2016; Douglas, 2013; Greenwood, De Leeuw and Lindsay 2018). As a consequence of Colonialism, systemic racism, and land dispossession have led to a myriad of health-related inequities between Indigenous and non-Indigenous populations in Canada (Anderson et.al., 2016; Canadian Institute for Health research, 2019; Greenwood, De Leeuw and Lindsay 2018; Phillips-Beck *et.al*.,2019).

Structural racism continues to have major implications on Indigenous peoples' health in Canada (Anderson *et.al*., 2016; DiAngelo, 2012). Racism impacts mental health and can have a cascading effect for Indigenous peoples. A report from the Assembly of First Nations states: "racism is closely connected to the social determinants of health and well-being. If a person is experiencing racism, they are most likely feeling socially excluded, which will negatively impact their ability to access health and well-being" (Reading *et.al*., 2007, 20). Racism also impacts access to culturally safe and equitable health care and can negatively impact a person's ability to

earn income, to feel comfortable engaging in society, and to have their basic human rights met (for example, access to clean water, healthy foods, and adequate shelter).

Indigenous health is inextricably linked to the land and thus is directly connected to land-based knowledge and practices. Since European contact, dispossession from the land, and in particular, loss of access to important plant cultivation and harvesting grounds, has severely impacted Indigenous People's health and well-being (Reading *et.al*., 2007; Simpson 2004,2017; Geniusz, 2015; Talaga, 2018; Turner *et.al*., 2008; Turner, 2014). Settler colonialism's goal to remove Indigenous peoples from their lands has compromised many communities' access to land-based knowledge and practices; ongoing racism towards Indigenous peoples maintains these conditions for access as settlers continue to control over 95% of Canada's land base.

Indigenous Peoples consistently identify colonization as a prime determinant of their health, although this has yet to be fully, and consistently, listed as a key determinant to health in Canada. More broadly, however, research exploring the social and emotional well-being of Australian Indigenous Peoples, found that colonization, historical trauma, grief, loss, and ongoing racism and social marginalization have significant negative health impacts. This research brought forth the argument that indicators of wellness based solely on a biomedical model may not be adequate or relevant in an Indigenous context as they do not consider key factors that impact Indigenous people's health (Griffiths *et.al*., 2016; Le Grande *et.al*., 2017).

Indeed, it is not possible to address the Indigenous health crises, without first recognizing and understanding the historic and contemporary impacts of colonization and racism on Indigenous health, identity, and culture (Reading et.al., 2007; Health Canada, 2016; Greenwood, De Leeuw and Lindsay 2018; National Inquiry into Murdered and Missing Indigenous Women and Girls, 2019; Griffiths *et.al*., 2016; Talaga, 2017; Joseph, 2018). Table 1 lists the determinants of health as identified by two different organizations, the Public Health Agency of Canada (PHAC) and the National Aboriginal Health Organization (NAHO). This contrast between the top health determinants defined by an Indigenous led health organization, versus the general population, demonstrates the different impacts and priorities that are present in an Indigenous health context. The past and present effects of colonization, in an Indigenous SDoH, encapsulates many of the Public Health Agency of Canada's SDoH: Inequities regarding income, social status, social support, education, employment, and other SDoH's—are the products of colonization, with profound effects on Indigenous health in Canada.

Table 1. Comparison of the Social Determinants of Health (SDoH) between the Public Health Agency of Canada and the National Aboriginal Health Organization

	Public Health Agency of Canada SDoH	**National Aboriginal Health Organization SDoH**
1	Income and Social Status	Colonization
2	Social Support Networks	Globalization
3	Education and Literacy	Migration
4	Employment or Working Conditions	Cultural continuity
5	Social Environments	Access
6	Physical Environments	Territory

7	Personal Health Practices and Coping Skills	Poverty
8	Healthy Child Development	Self-determination
9	Biology and Genetic Endowment	
10	Health Services	
11	Gender	
12	Culture	

Ethnobotany and Type 2 Diabetes

There is an urgency for culturally relevant approaches to the prevention and management of Type 2 Diabetes within Indigenous communities in Canada. Primary prevention of T2D has become the focus of recent research (Paradis and Potvin, 2005; Phillips-Beck *et.al*.,2019; Satterfield et.al., 2016; Tremblay et.al., 2018). Understanding the interconnected nature of colonization, and the related trauma across all aspects of Indigenous lives including health, education, child welfare, incarceration, violence, and racism offers insights into how to approach T2D in a culturally relevant and holistic way. Historically, Indigenous health has relied on the interplay between healthy diet, preventative use of Indigenous plant medicines, and frequent culturally related exercise (Anderson, 2016; Canadian Institute for Health Research, 2019; Schnarch, 2013).

Ethnobotany offers one point of entry to address T2D in a culturally rooted way. It is important to inform ourselves, as ethnobotanists and researchers, about the inextricable links between our research, Indigenous health, and the history of colonization. Working from this informed place, we can focus on ensuring that community priorities are a guiding principle in our research, and that we are making meaningful contributions to communities with whom we conduct research— such as promoting cultural interrelationships with land. Prioritizing increased access to culturally important plants in Indigenous communities is essential, and can take many forms: for example, building community gardens and greenhouses; creating a community "medicine chest" or apothecary; and/or helping to develop confidence in plant identification, cultivation, transplanting, and seed saving. Our work can culminate in producing resources and deliverables desired by the community and that support the process of reconnecting to culturally important plants.

Our health is based on our relationships with plants

As human beings we have co-evolved alongside plants over millennia. Plant foods have been known to shape the evolution of physical characteristics throughout human evolution (Shcall, 2019). Plant foods and medicines provide a form of preventative health care in that they uphold physical health and help to avoid disease (Martin and Li, 2017). Plants provide essential nutrients including vitamins, amino acids and minerals, they are often rich in fiber, and many contain prebiotics that support the microbiome (Enders, 2018 ,p.251). Plants offer the human body these essential nutrients that we cannot produce without them (Martin and Li, 2017). Plants make up the majority of our global food sources and we currently rely on approximately 15 plants out of the 50,000 edible plants worldwide to support our global food systems. There have been over 70,000 plants identified in Canada and approximately 1000 plant species have been utilized in culturally significant ways by Indigenous Peoples in Canada (Turner et al., 2012).

Plants as Relatives

Often plants are considered resources to be manipulated and exploited for our gain as humans in areas such as agriculture, pharmaceuticals, providing building materials and more. What shifts when we define plants as relatives, relations that reflect our responsibility to uphold our side of the relationship, as opposed to resources? How does this adjustment in language assign a different meaning or context? Plants hold a critical place in Indigenous cultures (Joseph et.al., 2022; Kimmerer, 2013). Plants provide nourishment, medicine, spiritual support, and materials but they also offer connectivity to the natural world and teachings about reciprocity, responsibility and stewardship. Revitalizing relationships with culturally important plants is a part of rebuilding cultural identity and is foundational to developing culturally rooted conceptualizations of health and wellness.

From a Sḵwx̱wú7mesh (Squamish) perspective, plants are relatives that uphold health in a holistic way that is inclusive of physical, spiritual, emotional, and mental health, and plants connect us to ancestral knowledge of how to care for ourselves, our communities, and the land (Joseph et.al., 2021). If the land and water systems that the plants rely on are not in good health, then the plants themselves will not offer the nourishment and medicine they carry and all life that is in relationship with that place will be impacted. It is impossible to separate our health as Sḵwx̱wú7mesh People from the health of the land and non-human life. We are all connected.

Indigenous communities are unique and diverse. The act of revitalizing and reclaiming plant-related knowledge and practices will look different across, not only North America but globally, however, commonalities can be found between the direct correlation of plant-based knowledge and practices with identity, connection to place and how these factors influence cultural views on health and wellness.

Cultural Relevance in Research and Identity-based Motivation

Approaches to ethnobotanical research that are culturally relevant and grounded need to come from within Indigenous communities. There are powerful motivators within any community that can contribute to either healthy or unhealthy shared practices, including between marginalized peoples and their perspectives on health promotion activities. Oyserman et al (2007) introduce the term “identity-based motivation” describing how communal behaviors and habits offer a shared identity. In the context of health promotion, they propose that the impacts of oppression, colonization and racism on identity-based motivations can lead to a fatalistic view of their health. These beliefs can be manifested through the development of unhealthy identity-based behaviors, such as eating highly processed foods, consuming alcohol, or smoking. According to the authors, health promotion activities are often viewed as being white middle class in nature and focus; thus, there may be little, to no, self-recognition in health promotion if it is not culturally rooted or relevant in some way (Oyserman, Fryberg and Yoder, 2007). Given the “dire need to develop interventions to promote health and reduce health risk such as … diabetes, even among children, further work linking health promotion with social identities other than White and middle class is vital” (Oyserman, Fryberg and Yoder, 2007).

Anti-colonial and Decolonizing Approaches in Ethnobotany

In this paper, we offer that ethnobotany has an important role in contributing to the cessation of the T2D epidemic affecting Indigenous communities, However, given the traumatic and inequitable history of research on Indigenous peoples, it is important to first consider what it means to take a decolonizing or anti-colonial approach to ethnobotanical research (Joseph et.al., 2021). According to Tuck and Yang (2012:pg 3), "decolonization brings about the repatriation of Indigenous land and life; it is not a metaphor for other things we want to do to improve our societies and schools." The authors argue that when decolonization is turned into metaphor it negates the very possibility of decolonization and "re-centers whiteness, it resettles theory" (Tuck and Yang, 2012:pg 3). There are concerns that the superficial integration of the language of decolonization can result in the "domestication of decolonization" which can detract from the process and subsequently lead to the refocusing on "settler guilt and complicity" instead of centralizing Indigenous knowledge, experience, and expertise (Antoine, 2017; Tuck, 2012). Increasingly, ethnobotanical literature is focusing on decolonization: it is essential to ensure that the way in which the language and theory of decolonization is integrated is not recreating the pitfalls listed above.

How do we as ethnobotanists then decolonize research within an institution that is inherently colonial in nature? It is impossible to move towards decolonization of ethnobotanical research without having more Indigenous People involved across every level of the discipline. In a model put forth by Linda Tuhiwai Smith, taking anticolonial and decolonized approaches to research focuses on the central goal of self-determination and involves healing, decolonization, transformation, and mobilization of Indigenous Peoples (Smith, 2012). In her book "Decolonizing Methodologies," Smith explains that colonization is but one expression of imperialism and that research from an imperialist viewpoint assumes that Western ideas are the most rational—sometimes the only rational—way to view and make sense of the world (Smith, 2012). Imperialism has dictated who holds power and thus from what perspective history is recorded; it has defined who is human, who is normal and who is other. The Western academy is built upon imperial and colonial representations of history and humanity. Often this excludes Indigenous worldviews, voices, histories, and cultures. Research grounded in the academy has been, and in some cases still is, used as a tool, knowingly or unknowingly, to dehumanize and disempower Indigenous Peoples and maintain their status as inferior and other.

One path forward necessitates that Indigenous People lend their voices and perspectives to re-storying dominant Western history. The process of re-storying means telling alternate histories from non-European perspectives. This process allows us as Indigenous People to move forward in alternative ways and look towards alternative futures (Corntassel, Chaw win, and T'lakwadzi, 2009). We can know where we are going by knowing where we have come from.

Relationships between Indigenous communities and researchers, including ethnobotanists, are changing. As Indigenous People and communities heal from the trauma inflicted on them by colonization, more and more individuals are contributing their voices and perspectives on changes that need to be made across many fronts, including how ethnobotanical and ethnobiological research is conceptualized and carried out. This is not to say colonization is a thing of the past but instead to focus on the ways Indigenous Peoples are healing, carrying out cultural political resurgence across many areas, and envisioning and creating the futures they

want for upcoming generations. Changing the research relationship between Indigenous and non-Indigenous researchers and communities is necessary for the fields of ethnobotany and ethnobiology to evolve, transform, and grow (Joseph et.al., 2022).

Researcher Fragility and Discomfort

Change often brings feelings of unease and discomfort. Critical race theory and whiteness studies posit that experiencing discomfort without shying away from the experience and learning the tools to effectively increase one's capacity to experience discomfort are essential skills for white and settler researchers and practitioners across disciplines (Roubos, 2016; DiAngelo, 2011). Working with discomfort allows us to deepen our learning and is a necessary part of growth for anyone working towards embodying an explicitly anti-racist praxis (Roubos, 2016; DiAngelo, 2011). Leanne Betasamosake Simpson offers guidance to non-Indigenous academics and states that "academics who are to be true allies to Indigenous Peoples in the protection of our knowledge must be willing to step outside of their privileged position and challenge research that conforms to the guidelines outlined by the colonial power structure and root their work in the politics of decolonization and anticolonialism" (2004). A key factor in successfully making the shift toward challenging systems of oppression and power is for white and settler researchers to have a support system they can turn to when they encounter the discomfort, isolation, and backlash that can accompany their challenges to power (Sue, 2017).

Ultimately, much responsibility lies with non-Indigenous ethnobotanists to inform themselves through a process of critical self-reflection and deep engagement to understand the impacts of colonial history on Indigenous plant knowledge and the subsequent implications for Indigenous health. The very foundation of the field of ethnobotany is rooted in Indigenous land-based relationships established through thousands of years of interconnection with culturally important places, plant foods, medicines, materials and spiritual aids; in other words, long-standing reciprocal relationships between Indigenous peoples and their plant relatives. And yet, historically non-Indigenous researchers have built their careers on Indigenous knowledge without engaging in meaningful reciprocity with the communities from whom they learned. This is a clear manifestation of extractive colonialism in the academic field. Without a working understanding of how the forces of imperialism, settler colonialism, patriarchy, white supremacy, and capitalism shape and impact the field of ethnobotany, the discipline will continue to risk enacting harm on Indigenous peoples. All non-Indigenous ethnobotanists should consider what collective responsibility exists in addressing impacts of colonization and what actions we may take as ethnobotanists to redress past wrongs of the profession, support cultural political resurgence in the context of Indigenous plant-related knowledge, and reorient accepted research methods to support these goals.

Respectful Ethnobotanical Research

There are changing standards and expectations in connection to ethnobotanical research relationships within Indigenous communities. Engaging in respectful and reciprocal approaches to research from the start is essential in building research relationships with foundations of trust, transparency, and humility. While the assessment of the potential harm in proposed ethnobotanical research needs to be determined by Indigenous People (Tallbear, 2014), researchers also shoulder much of the responsibility to ensure they are establishing and upholding respectful and reciprocal relationships with the communities they work with. The

concept of relational accountability according to Reo (2019) offers an ethical guideline for conducting research with Indigenous nation partners and extends the researchers responsibility beyond maintaining reciprocal relationships with community members to incorporating the entire community of relational beings, plants, animals, mountains, waterways and more. Because of the history of unethical and damaging research conducted with Indigenous peoples, developing these relationships takes time and is not quick or easy work. Reo emphasizes that it is not sufficient to have good intentions about ethnobotanical research; respectful actions are required, as well as an understanding that as ethnobotanical researchers, we need to recognize that we are trained in Western approaches to ethical research, and we need to collaborate with communities in (re)defining Indigenized models of ethical, relational, and reciprocal research. These actions, according to Reo, will help equilibrate the paternalistic and colonial history of university-Indigenous relations and that we as researchers need to abandon the "arrogance of expertise" and approach research as embarking on a shared journey (Reo, 2019).

Grounded Normativity

Grounded normativity is a concept put forth by Dene scholar Glen Coulthard which sets out a framework for considering the relational nature of Indigenous knowledge and lives. Grounded normativity teaches us how to live in relation to other people and nonhuman life forms in a "profoundly non-authoritarian, non-dominating, non-exploitative manner" (Coulthard and Simpson, 2016). In Braiding Sweetgrass, Robin Kimmerer shares reflections and stories that support the perspective that the point of Indigenous knowledge is not understanding ecological relationships, but participating in and tending to relationships—with plants, animals, minerals, waters and with one another (2013). Indigenous resistance and resurgence in response to the dispossession linked to colonization, therefore, employs approaches designed to reconnect Indigenous people to the land and related knowledge.

Section 2: Case Study of the Yetwánaý Project, A Skwxwú7mesh Plants and Type 2 Diabetes Project

Introduction to the Yetwánaý Project

In 2018, the Canadian Institute for Health Research (CIHR) funded project "Bridging Traditional and Scientific Knowledge to improve Type 2 diabetes prevention and management through a participatory community-based approach targeting Traditional diet, healing, and physical activity" was initiated. The project included four Indigenous communities across Canada including Sḵwx̱wú7mesh Nation along with two northern Cree and one Innu community. Each community decided how best to explore the role of culturally important plants within the context of the prevention and management of Type 2 Diabetes. As the research liaison and community lead, the first author Leigh Joseph conducted initial meetings with community representatives from various Sḵwx̱wú7mesh Nation departments and community programs. After initial consultation and conversations, it was decided that Sḵwx̱wú7mesh would take a participatory, land-based approach to rebuilding connections to culturally important plants in the context of the prevention and management of Type 2 Diabetes. The project was named The Yetwánaý (yet-wan-eye) Project, yetwánaý is the Skwxwú7mesh name for salmonberry (*Rubus spectabilis*) and this name was chosen because yetwánaý is one of the first plant foods that becomes available in the spring, marking the change in the seasons as well as the return of nutritious plant foods. We felt this name captured the return to plant knowledge within the Skwxwú7mesh community

participants who were part of this pilot project. A process-oriented approach was taken to allow for a high degree of participant feedback, reflexivity and ongoing reflection to ensure the project was aligning as well as possible with the community and participant priorities.

The research planning committee for the pilot program was led by Leigh Joseph and included representatives from Sḵwx̱wú7mesh Nation health, education, recreation, and chief and council, and had input from both elders and youth. The one-year program followed a Skwxwú7mesh seasonal round and covered knowledge and activities related to plants that were seasonally available, as well as how to identify, harvest, prepare, and process the plant materials throughout the year. A small team of co-facilitators with backgrounds in anti-colonial methodologies and plant-based health and wellness was formed to plan and co-facilitate the one-year land-based community plant project.

Based on this community-involved and consultative process, we arrived together at the following objectives for the Yetwánaý Project:

1. To renew, and create opportunities to re-engage with, Indigenous cultural knowledge of plant foods, medicines, and harvesting within the context of augmenting existing community-based programs that are interested in taking culturally rooted approaches to prevention and management of Type 2 Diabetes.

2. To explore, identify, and highlight actions for taking Indigenized and anticolonial approaches to ethnobotanical research in a health context and how this can be informed by the work of Indigenous academics, activists, and theorists in complementary fields.

Yetwánaý Project On Skwxwú7mesh Lands

This research was carried out on the traditional territory of the Skwxwú7mesh People (Figure 1). Skwxwú7mesh traditional territory encompasses broad geographical and ecological diversity, including rugged mountain peaks, alpine ridges, deep river valleys, temperate rainforest, extensive wetlands, island archipelagos, and expanses of coastline. This dramatic landscape lends itself well to the many land-based stories that describe the origins and history of this rich territory. The territory spans from Kitsilano (Khahtsahlanogh), through West Vancouver to Squamish and further north, past the town of Pemberton. The Skwxwú7mesh People are part of the larger Coast Salish cultural and linguistic group (Suttles, 1990). Today Skwxwú7mesh people live in nine communities throughout their territory that encompassed 23 village sites in the past. This research was carried out primarily in the Squamish Valley and not in Capilano or other urban villages within Skwxwú7mesh territory.

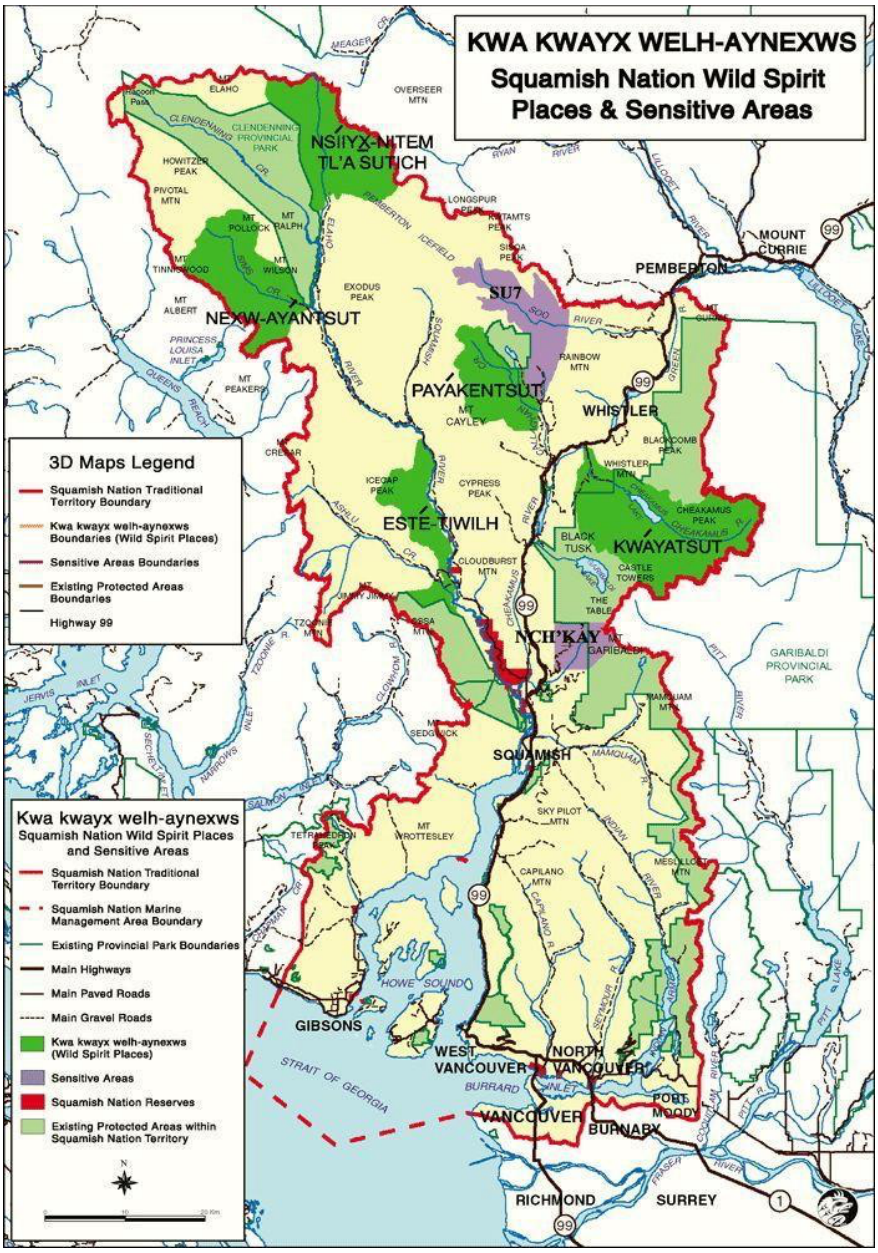

Figure 1. Squamish Nation traditional territory map. Accessed https://native-land.ca/maps/territories/skwxwu7mesh-uxwumixw/ [April 23 2022]

Theoretical Groundings of the Yetwánaý Project

This research was grounded within concepts from Community Based Participatory Action Research (CBPAR) and Insurgent Research. CBPAR integrates guidance and collaboration with community at every step of the research process and demonstrates reflexivity throughout. Insurgent Research (IR), a term coined by Métis researcher Adam Gaudry, is motivated by "grassroots-academic collaborations that resituate Indigenous interests and values in an otherwise alienating research process" (Gaudry, 2015:113-136).

The principles for Insurgent Research are:

1. Research that is grounded in, respects, and validates Indigenous worldviews.
2. Research output that is intended for use by Indigenous communities.
3. Researchers are responsible to Indigenous communities for the decisions that they make, and communities are the final judges of the validity and effectiveness of research projects.
4. Research is action oriented and inspires direct action in Indigenous communities.

We will return to the principles of Insurgent Research through the discussion of our research as a framework to reflect on the process-oriented and reflexive approaches taken within this project. Participatory methods, along with methods rooted in Indigenous worldview, make the voice of the community members explicit in all research phases. Undertaking indigenized approaches to ethnobotanical research necessitates that Indigenous voice be central throughout the research process from design to publication (Ermine, 2000; Gaudry, 2015; Posey, 2003; Tuhiwai Smith, 2012; Joseph *et.al*, 2022).

Participant Recruitment

Participants were recruited and selected to participate via sign up forms at community information events and through an information poster in the community newsletter. We also had some word-of-mouth recruitment through community members who had signed up to participate and through our partnering. We initially put out a call for 30 community members, 15 who are currently living with T2D and 15 who are either pre-diabetic or wanting to learn about the prevention of T2D. This shifted when we recognized that there were barriers to recruitment for such a long-term commitment. We opened the program to all interested participants so as not to exclude interested community members. We had our core participant group, comprised of 8 people, but we also held seasonal community gatherings that were open to the Squamish Nation community to attend and learn about the program and contribute their perspectives. These community gatherings were well attended.

Yetwánaý Project Methods

Following Community Based Participatory Action Research (CBPAR) and Insurgent Research methodologies, the Yetwánaý Project began with meaningful community consultation. This included seeking and receiving guidance from the Sḵwx̱wú7mesh Nation research planning committee, conducting background research and a literature review. Members of the Sḵwx̱wú7mesh community that represented leadership, education, health, community programming, elders and youth groups participated in the initial consultations and discussions. These consultations led to the collaborative decision that we would structure this research as a one-year land-based and hands-on program for Sḵwx̱wú7mesh community members, that would follow the seasonal round of culturally important plants in the Sḵwx̱wú7mesh territory.

Previous community-based work in Sḵwx̱wú7mesh had identified areas of high priority for enhancing community members connections to culture and one of these was connecting to traditional foods and building better connections to Sḵwx̱wú7mesh lands and knowledge of traditional plants (Preissl et.al., 2018).

It was important to seek out and honour prior community-based knowledge and research as part of the decision-making process for this project. Indigenous communities often report

"engagement fatigue" from repeatedly responding to the same questions for different research projects; doing our due diligence to seek out and understand what had already been discussed in Sḵwx̱wú7mesh allowed for the community consultations to be done in a more respectful, informed and effective way.

We took a process-oriented approach, meaning that we strategically designed the one-year program to be reflexive, adaptive, and to maintain space for observations on the process of carrying out this research throughout the course of the project. As a research team, we remained open to community consultation and ongoing dialogue with our key community participants. These processes did not end once the project direction was set. Throughout the research project we sought ongoing feedback and validation of next steps from both the Sḵwx̱wú7mesh Nation research planning committee and from community participants. The dialogic nature of the iterative consultations allowed the project team to adjust the research process to suit the community's needs.

Thematic Analysis

We employed an inductive thematic approach to the analysis to review the data (Braun and Clark, 2006; Braun et.al., 2019). Through this process we let the data guide our analysis and the theme development. We identified six themes that helped to group the data and organize it for our discussion. The themes were emergent and came from reading the data and looking for key words and concepts that could then be grouped into the six themes. In keeping with taking a process-oriented and insurgent research approach to both the research and analysis, we analyzed not only the data from harvest surveys, interviews, community gathering reports, and group facilitation activities, but also planning materials such as meeting notes with the Sḵwx̱wú7mesh Nation planning committee and the broader CIHR grant planning group. Carrying out a thematic analysis worked well for this project as it supported the variety of data collection methods we used and allowed us to examine the full timeline of the project, from initial conversations and planning through to the project implementation and completion.

As an overview for the greater context for this research the following diagram (Figure. 2) offers a framework for beginning to consider the interconnectedness between Indigenous conceptualizations of health and how these intersect with potential approaches to addressing T2D.

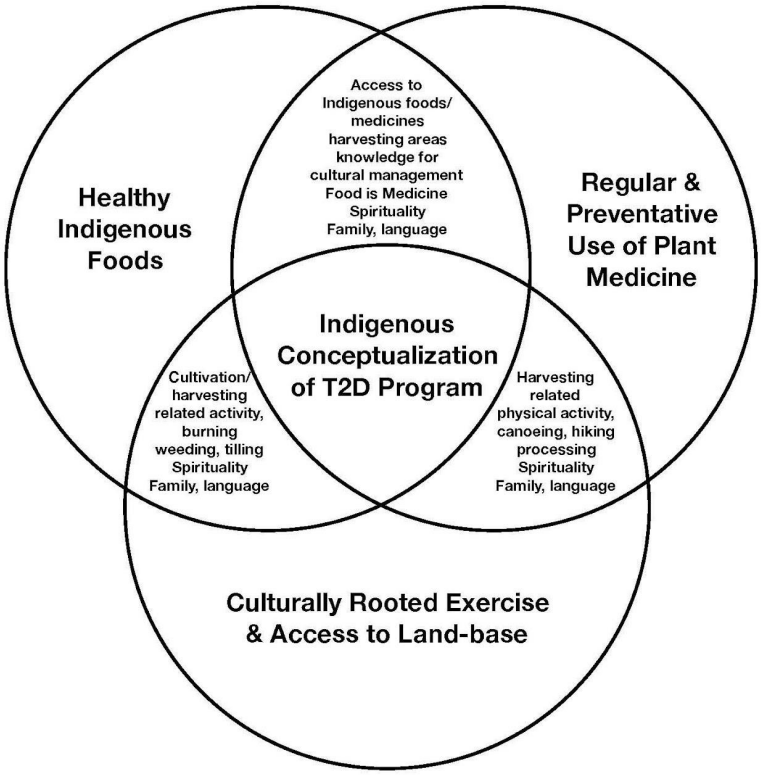

Figure. 2 Indigenous conceptualization of the needs a T2D program should incorporate. The various aspects of how the disease is connected to Indigenous perspectives on wellness and what is required to be healthy.

Data Collection

The data collection was carried out throughout the planning and duration of the project. The process-oriented approach we took relied on ongoing community and participant feedback and our ongoing reflexivity. The core framework for our one-year land-based and hands-on ethnobotanical program was built around the activities on the land where we harvested together, a series of hands-on workshops where we created healthy food and wellness recipes, regular small group sessions to build on wellness practices and knowledge, and seasonal community gatherings to share updates and information with the broader Sḵwx̱wú7mesh Nation community (Table 2). In all four types of gatherings, we employed a mixed methods qualitative approach to receiving information and input. Data collection methods used at the small group sessions and seasonal community gatherings included open-ended and closed survey questions, often presented creatively (e.g., place a basket in the paper bag with the plant that you want to learn more about next season, as a metaphor for "harvesting" the plant knowledge; rank the type of plant knowledge resources you want to see created for community use), as well as open-ended questions that people could answer verbally or in written form (e.g., on a post-it placed on a poster with the discussion questions; on a worksheet with culturally relevant imagery or metaphors).

While photovoice was introduced to the core participant group during a weekly session, participants did not follow through with a regular photovoice practice when on the land or creating recipes together. For future projects this could be a great tool.

Qualitative data was collected in connection to land-based harvesting trips in the form of harvest surveys that were completed by Sḵwx̱wú7mesh community members after our land-based sessions. These surveys were designed to assess the participants prior knowledge of the subject matter for the topic of the trip, to see what information and knowledge they gained through the course of the harvest trip.

Monthly Indigenous plant workshops were held with the core participants of the T2D program in Sḵwx̱wú7mesh Nation over the course of the one-year pilot program. This series of workshops provided an opportunity for participants to learn about plant identification, harvesting practices and then make plant-based foods and medicines as a group. The goal of these workshops was to build community skills and confidence while actively strengthening relationships with plants.

Table 2. Research activities and participation through the one year pilot project in Squamish.

Method	**Activity**	**Participation**	**Special Notes**
Interview	Semi-structured/key informant interviews.	Interviewed the community research committee, all of whom are heads of Sḵwx̱wú7mesh departments. These people were instrumental to this project and plant knowledge work in the community more broadly.	We intended to do interviews of all regular program participants but with the COVID-19 pandemic starting [March 15 2020], this was set aside.
Land-based Sessions	Went out on the land on several occasions and harvested Devil's Club, Oregon Grape, Blueberries and Balsam Pitch. Spent full days outdoors and completed surveys.	A total of 29 community members attended the different land-based sessions. Numbers varied between 9 to 11 participants per session.	These land-based sessions were planned in locations accessible to elders and other participants with potential mobility challenges.
Quarterly/ Seasonal Community Gatherings	Held community gatherings leading up to the one-year pilot project. These community gatherings were well attended	A total of 160 community members attended community gatherings. The number of participants at the individual	We held these gatherings at Totem Hall, which were announced in the community newsletter, on Facebook, and shared by word of mouth.

	and helped us to understand community priorities and helped with recruitment.	gatherings varied.Our estimated range of participants per gathering was 15-0.	
Plant Celebration	A full-day seasonal community plant celebration with community and land-based hands-on workshops and a traditional foods luncheon that featured many culturally important plant foods.	This event had over 200 attendees and was an exciting and engaging day of celebrating plants and their cultural importance and applications for health and wellness.	This event had been an annual event for three years but it ceased during the onset of the COVID-19 pandemic [2020] but this would be a great event to bring back given the amount of interest it fetched and how engaging it was.

A Community-based Response to COVID-19

The Yetwánaý Project was set to run from September 2019 to August 2020. In March 2020, COVID-19 disrupted our in-person research activities as all in-person programming ceased (Table 2). Our research team and the participants communicated via email and zoom to discuss how best to pivot our research program. One major impact on data collection was that while we had intended to interview each program participant, the stress and chaos of dealing with the pandemic meant participants were unable to follow through. Connecting online allowed us to focus on those resources participants needed to stay engaged with traditional plant identification, harvesting, and preparing medicines and recipes.

Yetwánaý Project Results and Discussion

We combine the results and discussion sections for this paper, recognizing that there are many elements to this research that are inextricably related and can not be unwoven without losing meaning, context, and nuanced connections. Honouring this, our thematic approach to the data analysis identified six interrelated themes:

Theme 1: How Indigenous plants connect to health and wellness
Theme 2: Continuity with ancestors
Theme 3: The personal and cultural implications of Type 2 Diabetes
Theme 4: Limitation or barriers to connecting to plants and the land
Theme 5: Ongoing impacts of colonization
Theme 6: Importance of having Indigenous researchers

These themes were found to be present from the community planning stages and continued to be identified throughout the research as priority areas. The prevalence or focus on each theme shifted throughout the program as community participants spent more time with the facilitators and further developed their skills with identifying and preparing foods and medicines with culturally important plants. We provide a brief discussion of each theme below.

Theme 1: How Indigenous Plants Connect to Health and Wellness
Participant goals and visions for the project included:

- sharing time on the land and waters with family members and friends;
- opportunities for intergenerational learning;
- engaging in physical movement during culturally relevant activities such as hunting, fishing, and harvesting and processing plants;
- sharing resources (such as tools and facilities) to harvest, process, and prepare traditional foods and medicines; and
- integrating traditional foods into individual, family, and community health approaches.

These community visions demonstrate the Sḵwx̱wú7mesh concept of health and wellness as something not focused on individuals, but rather places people in a web of kinship that includes their human and non-human relatives (Salmón 2000). The wellness of the land, waters, animals, plants, and minerals has a direct impact on people's wellness. The combination of movement, land, and family is what makes health and wellness possible. These sentiments are shared through much of the Indigenous literature written on related topic areas (e.g., Coulthard and Simpson, 2016; Geniusz, 2015; Joseph et.al., 2021;Kimmerer, 2013; Reo, 2019; Simpson, 2014).

The land-based sessions brought through additional embodied reflections from participants about how engaging their different senses brought them feelings of wellbeing: for example, smelling a flower, leaf or a berry that brought back childhood memories of harvesting with family members; feeling a sense of calm through touching the plants while processing them; and the unfiltered joy of tasting a traditional food prepared alongside other participants. We found when there were elements of scent, flavor and feel, participants had an elevated experience of both remembering and creating new experiences that strengthened their knowledge and connections between plants, the land and their own health and well-being and that of their families. Participants expressed that during the hands-on sessions, they experienced joy, ease, connection to ancestors, relaxation, and gratitude to the land and to the knowledge holders for their generous sharing. Many people commented that socializing and bonding with their peers during the land-based sessions was a key component of experiencing wellness together. Multiple participants also expressed a feeling of empowerment at the realization that harvesting is a form of movement, and that the traditional foods they already love are medicinal. Finally, following the Oregon grape session, in which no participant had worked with the plant previously, almost all participants expressed confidence in harvesting and processing the plant on their own. These insights show that hands-on, embodied learning can provide the space for people to engage their senses and memories in ways that strengthen their learning in service to their physical, social, emotional, mental, and spiritual health and wellness; however, the learning environment must be culturally safe enough for this depth of learning to be possible.

In both the community meetings and the project sessions, the theme of (re)connection to the land and plants came through again and again. Participants expressed that developing a relationship with and respect for the land requires being on the land, despite many barriers to do so (e.g., invasive species, development—see Themes 4 and 5 below).

Connection to the land includes fighting to protect it, not just harvesting its gifts (Reo, 2019; Armstrong and McAlvay, 2019; Estes, 2019; Joseph, 2023). In this process of (re)connecting to land, people become aware of their plant gathering places and can thus better protect them. Many participants spoke to Sḵwx̱wú7mesh Nation being in the initial stages of (re)connection to land, and acknowledged that time, resources, and opportunities are needed to bring all community members along in this process. From a research perspective, these insights reinforce the need for researchers' responsibilities to include removing barriers to Indigenous connection to the land, as well as having cultural awareness to why Indigenous communities may not know their cultural ways—or be open to sharing it broadly.

Further, the data demonstrates that the most engaging events were the harvesting and land-based trips, as well as the hands-on workshops. Uniting these aspects of the research is that for participants, the lived experiences helped them to directly improve their comfort with plant identification, sustainable harvesting, and preparing a food or medicine with the plant. The community-wide plant celebration events were also a key time for people to come together, share food and knowledge in a joyful environment, and discuss what more they want to learn. Knowing this, we would suggest prioritizing as many land-based and hands-on sessions and experiences as possible when doing research with Indigenous communities.

Theme 2: Continuity with ancestors

As participants engaged with traditional plants, medicines, and the land, they often spoke about feeling an immediate connection to family members as well as their ancestral connections to land and place. Thinking and speaking of ancestors in land-based sessions and in some interviews often brought forth good memories of harvesting with family members, as well as powerful feelings of joy, spiritual and physical belonging, and ongoing care for one's ancestors. Indeed, one participant shared that in order to truly "be Sḵwx̱wú7mesh," respect for ancestors is central and includes acknowledging how the ancestors still share their knowledge today. Another participant highlighted that Sḵwx̱wú7mesh conceptions of wealth focus on the number of people in one's family and not on material resources, because true wealth lies in who holds you up and cares for you, and the ancestors carry and share that teaching.

The topic of ancestors also brought up tender and painful memories of being displaced from Sḵwx̱wú7mesh ancestral territories through colonization. Despite these historic and ongoing challenges with access to land, and especially for people not living on their home territories, traditional plants and foods act as a connector to ancestry and often are the most accessible way for people to stay connected to their ancestral lands and peoples. Indeed, participants at land-based sessions and community gatherings described how incredible it felt to experience this connection to their ancestors through the act of nourishing themselves as their ancestors did. The emotional and spiritual benefits of ancestral connection, along with the physical benefits of eating ancestral foods that have a long history of nourishing Sḵwx̱wú7mesh bodies, are important layers to the Sḵwx̱wú7mesh or Indigenous concept of health and wellness. This echoes other observations in the literature on the power of being in connection to the land (e.g., Luger and Collins, 2023; Joseph, 2021,2023; Kimmerer, 2013).

Theme 3: The personal and cultural implications of Type 2 Diabetes
While the project's focus was always on the connection between Type 2 Diabetes and traditional plants and medicines, in many ways the project's evolution from planning to delivery showcases the drawbacks of taking an overly narrow scientific or medicalized approach to ethnobotanical research with Indigenous communities.

The project began with a strong focus on T2D, and was initially conceptualized to include bloodwork, lab components, and a big focus on nutrition and individual health promotion behaviours in the research. This approach would have taken a much more biomedical and individualistic approach to the research, focusing on different people's body processes and habits. However, through the insurgent and process-based research approach, the community's priorities shifted the project toward a more experiential and land-based approach (Salmon, 2000; *sensu* Gaudry, 2015). The participants expressed an interest in reconnecting to the land and plant foods and medicines and learning how to make recipes with plants to support their health. A significant and central goal that emerged for the Sḵwx̱wú7mesh community was to figure out how to talk openly about healing as a community without focusing on a deficit-based mindset, stigmatizing T2D and Indigenous bodies, or perpetuating shame for something out of people's control. The paper by Oyserman *et.al*. explored the concept of Identity Based Motivation and how the collective cultural and social identity of a group or community of people can impact their mindset in connection to health and wellness practices (2007). Pilot project participants also expressed wanting to feel empowered to prevent and/or manage Type 2 Diabetes—either theirs or a family member's—as well as wanting to learn how to grow plants to manage or mitigate symptoms of T2D, incorporate traditional plants into daily life, or learn light exercises that can help with T2D management.

The connections between systems like medical racism and enforced poverty through colonial policy, and Indigenous health and wellness, came through in the community-based development of the project. Participants shared how they often feel uncomfortable going to the doctor because of ongoing medical racism that exists. Medicalized research programs often require researchers to use problematic Western health measures, such as the BMI or Canadian food guide, which are not culturally informed and perpetuate body-based shame (Paradies, 2016; Phillips-Beck *et.al*., 2019). The community-based committee saw the potential for the project to be ground-breaking if it could avoid these systems. The power to build and facilitate a project guided by community meant that the focus on T2D almost became secondary because other goals were taking precedence. This decision does not negate the reality that T2D is prevalent and on the rise in Indigenous communities, nor did it remove the opportunity to support proactive wellness-based individual actions that can improve physical health. The project still included T2D-focused components such as learning about spiked glucose, the role of movement in managing T2D, and other biomedical aspects. These aspects of the project were facilitated by partners such as nutritionists or exercise scientists, who had been screened to ensure they were ready to learn about the benefits and links between cultural connection and wellness; in this way, learning was reciprocal between facilitators and participants. Importantly, the project stayed grounded in Sḵwx̱wú7mesh culture throughout, with these components from western science and medical care ultimately informing the project rather than defining the research.

Theme 4: Limitation or barriers to connecting to plants and the land
Throughout the project, participants spoke to the barriers and limitations they face in accessing traditional foods, medicines, and the land. These barriers are inextricably tied to the ongoing impacts of colonization, which we discuss in Theme 5 . In fact, most of the barriers that participants identified ultimately stem from systems of oppression, so it is essential for researchers to remind people that these barriers are not a personal failure on their part.

Some of the barriers that participants identified are connected to and exacerbated by the imposed poverty of colonial policies: for example, transportation to get to the land, lack of income, lack of access to a laptop or other means to research and learn, and lack of time to harvest . These barriers can be mitigated with project budget allocations to support transportation, childcare, participation honoraria, and other measures that meet participants' immediate needs for participation. More broadly, it is the responsibility of all researchers to use their academic and institutional power to uplift community priorities, change university policies to create longer-term community supports (including beyond the term of a project or grant), and ultimately to shift their accountability away from funding deadlines and institutional requirements and toward community needs (Gaudry, 2015; Joseph, 2021; Simpson, 2004, Smith, 2012). Making this paradigm shift will empower researchers to reduce more barriers to community participation in their research.

Other barriers and limitations are grounded in forms of colonial interference such as dispossession from lands through the reserve system, and interruption of Indigenous knowledge transfer through the Indian residential school system and criminalization of Indigenous medicines (Geddes, 2017; Joseph, 2021; Schnarch, 2013; Talaga, 2018). For example, people described their general unfamiliarity with traditional plants, including not knowing what the plants are or where to find them. Other ongoing challenges include: industrial logging; overdevelopment of sensitive habitats; pollution and contamination of plants and watersheds; fear of encountering people who do not understand Indigenous rights while out on the land, and resulting conflicts; the low and dwindling number of Elders who hold traditional knowledge;lack of coordination within the community to bring the knowledge together; and current policies that continue to prevent Indigenous people from accessing their traditional territories. Each of these factors derive from colonial and capitalist government policies at the municipal, regional, provincial, and federal levels.

Perhaps more insidious is the fear and shame associated with learning. This was ingrained in Indigenous People at residential schools and then passed on to younger generations. If people are uncomfortable, fearful, or ashamed in any learning context, they may not show up to learn at all (Battiste, 2013; Simpson, 2004, 2014). Unlike the issues described above, which can be addressed through policy change, this barrier requires different approaches to dismantle. Without addressing the core of the issue—experiencing shame when learning —and creating safety for people to learn, the barrier will persist. Some of the ways these issues can be mitigated in research, which we employed throughout the project, include: having someone available to write for people; choosing facilitated activities over written activities (e.g., have people move around a room to answer questions instead of a survey); and generally being mindful of the length of a session, type of information, and delivery of that information to reduce triggers. Participants

identified that having ways to build their confidence, and for others to maintain compassion for them as they begin their learning journeys, were key to overcoming learning barriers.

Theme 5: Ongoing impacts of colonization

Consistent awareness of the ongoing impacts of colonization shaped the Yetwánaý project, from conception to the analysis of participant insights. Having this foundational understanding was essential because colonization impacts whether participants feel safe enough to participate in the research openly and fully. While this ties to Theme 6 (the importance of Indigenous researchers), all researchers need to be aware of the past and present conditions of Indigenous peoples due to colonial actions, policies, and interference. We do not live in a post-colonial society, as development, privatization, and pollution continue to prevent Indigenous peoples from accessing their territories. Further, the justifications for the violent dispossession of lands—*terra nullius*, the Doctrine of Discovery, etc.—are not resolved issues, and ongoing settler surveillance of Indigenous peoples as they exercise their rights is an assault against Indigenous peoples and their territories (Maracle, 2017; Simpson, 2017).

One specific example of the ongoing impacts of colonization came through in the three surveys participants filled out following the land-based sessions. While all participants had harvested blueberries previous to the session, no participants had harvested balsam fir or Oregon grape in the past. Indigenous people had more experience harvesting a food that is familiar to colonizers (blueberries) but had not harvested less-known-to-settler plants, showcasing the assimilation and loss that Indigenous people have experienced.

Other examples of the ongoing impacts of colonization (in addition to those discussed in Theme 4 above) include the pharmaceutical industry's exploitation of Indigenous knowledge, which has led to the degradation of medicinal plants' ecosystems and overharvesting: this problematic dynamic has also contributed to ongoing caution in Indigenous communities about sharing their traditional knowledge, including within communities (Turner *et.al*., 2008).

The two examples above showcase some of the losses that Indigenous peoples have experienced due to residential schools—both the loss of knowledge and the (very understandable) loss of trust in others. Some research participants highlighted the irony that until very recently, the push from colonizers was for Indigenous people to assimilate, yet now a generation or two later, settler researchers come to Indigenous communities to ask about ceremonies and traditional knowledge and are confused about why Indigenous people don't know them—or don't want to share them. This reality helps illuminate why the biomedical approach to the research project (as described in Theme 3) was not as relevant to Sḵwx̱wú7mesh Nation as taking a more holistic approach to the research.

With all this in mind, researchers must be careful not to retraumatize participants. Several practices and skills can help researchers build a safe research container for community participants (Joseph *et.al*., 2022; Smith, 2012). Keeping in mind at all stages of research that Indigenous people often experience shame at the loss of their knowledge and culture is essential. Being able to take cues from community and shifting a process as needed is critical, including in the face of emergent or unforeseen events that are based in colonization and can be

retraumatizing to communities (e.g., the ongoing uncovering of unmarked children's graves on former residential school grounds).

Theme 6: The importance of having Indigenous researchers

As we have identified throughout the previous themes, there are opportunities and responsibilities for all researchers working with Indigenous communities. However, for Indigenous researchers working in their home communities or elsewhere, there is the additional opportunity to Indigenize and/or decolonize academic research paradigms, which many community members acknowledge and celebrate. The knowledge that Indigenous researchers want to bring (back) to communities is also often based in reciprocity and community empowerment (Deeleuw et.al., 2012; Ermine, 2000; Gaudry, 2015; Joseph *et.al*.,2022; Smith, 2012).

Indigenous researchers often have a shared context and experience of being Indigenous—without falling into pan-Indigenous stereotyping—that provides a foundation of understanding of the barriers and challenges their Indigenous community research partners face, as well as of the beauty and continuity of ancestral connections and knowledges that they hold. Working from this place of shared understanding can lead to significant changes and transformations across the entire research process, toward more Indigenized research (Joseph et.al., 2022; Smith, 2012; Younging, 2018).

Indigenous researchers hold a lot of power and responsibility, which can be very intense. With the history of colonization and the desire and need to rebuild Indigenous knowledge bases, Indigenous researchers should be supported, both personally and professionally, to take culturally relevant approaches to their research. Indigenous researchers must be resourced appropriately to take the best research approach for communities, and academic institutions must take this seriously. This includes resourcing Indigenous researchers to learn from one another (for example, at Indigenous academic conferences and other gatherings). Taking a process-oriented approach to research creates the needed space for Indigenous practices and ways to be embedded in the research. Some of these practices include not rushing; bringing gifts to knowledge holders supporting and informing the work; shaping and reshaping the work based on community feedback; and working with a collective or collaborative approach—for example, with a community-based research committee. Developing a community-based research committee can also reduce some of the pressure on the Indigenous researcher, as taking a collective approach to the research is both culturally relevant and ensures the project is community-based, with the added benefit of bringing people together.

Yetwánaý Project Theme Summary

In this section we have identified the six key themes that emerged from the research project. These themes and their subsequent discussions are meant to support future ethnobotanical research projects in collaboration with Indigenous communities to learn from our findings and build on what it means to take culturally informed and culturally-sensitive approaches to community-based ethnobotanical research within Indigenous communities. The next section will present the research model that has been informed by our key findings.

Section 3: Wáts'iyus Harvest Basket Model for Community-based Ethnobotanical Research

Introduction

Based on the results of the Yetwánaý Project case study, we have developed the Wáts'iyus Harvest Basket Model. The following sections contain ethnobotanical metaphors meant to help bring a culturally grounded context to undertaking community-based research with Indigenous communities. In Sḵwx̱wú7mesh, a wáts'iyus is a basket woven from sléwaý, the inner bark of x̱ápaýay, the western redcedar (*Thuja plicata* Donn ex D. Don). Sléwaý is a resilient and adaptable material: when dried, it holds generous tensile strength; when exposed to the rain, it rehydrates to tighten the weave of the strips of inner bark. Sléwaý is a highly culturally valuable material for Sḵwx̱wú7mesh people and requires specialized knowledge, ceremony, and technology to harvest. While the Wáts'iyus Harvest Basket Model is centered on Sḵwx̱wú7mesh culture and context, it is meant to be adaptable to other Indigenous communities engaged in related ethnobotanical research and knowledge renewal work. The model has two parts: Part 1 is weaving the basket (research framework) and Part 2 is filling the basket (carrying out community-based ethnobotanical research).

Part 1: Weaving the Basket - Co-creating the Research Framework

The Wáts'iyus Harvest Basket represents the research framework, or the vessel that will hold all aspects of the research. The basket is made to endure many seasons beyond a researcher's work with a community.

- **Searching for the Tree: Research Preparation**
  In our metaphor, selecting the cedar tree to harvest from is symbolic of identifying the community to work with and/or determining a research topic that is of interest and priority to the community. The following cultural teachings that guide the selection of a cedar tree in Sḵwx̱wú7mesh also provide guidance for researchers selecting a community to partner with and choosing a research topic/project.

- **Don't harvest from a tree that has had bark pulled before.** This doesn't mean that you cannot conduct research with a community that has previously engaged in research, but it does mean you should be cognizant of the capacity of the community and their interest in working with you. There are many Indigenous communities that feel they have been over-researched or suffer from research fatigue.

- **The sap needs to be running in order to harvest sléwaý (inner bark).** This can translate to finding the right timing, both seasonally and in a broader sense, with any community partners. This consideration can happen across different scales. For example, the community may be going through processes that require long-term energy and output, such as land claims, repatriation of cultural artifacts or ancestors, or healing from events like the confirmation of unmarked graves at multiple residential schools. Any processes like these may require you to revisit your research timing. For example, the global COVID-19 pandemic began during this research project, so we had to address the impacts on the project and shift how we facilitated the program. There can be shorter delays or interruptions such as funerals, seasonal gatherings, or harvesting activities that

require you to put your research on hold. Just as the timing is so critical to successfully harvesting sléwaý, the same is true in the context of community-based research.

- **Preparing to harvest the bark**. Once you have found your tree, or established your research partner and project, this is the stage where continuing to build relationships grounded in trust with the Indigenous community's leaders, Elders, youth, community members, and the land itself, takes place. This is ongoing, but it is essential to build trust within the community from the start. This is also the time when you work with the community to refine and focus the topic of your research with their guidance and feedback.

- **Offering a gift & Giving Thanks.**
  This cultural practice of making an offering is important when one is about to harvest. In a research context, this may look like finding out what an appropriate gift and remuneration are for those who are involved in the research. Remember, you cannot carry out community-based research without the community's involvement and engagement, and there may be multiple barriers to people's ability to participate. Thus, valuing people's time and expertise and ensuring the exchange between you is reciprocal is important. There are other ways to enact reciprocity as well: you could plan a field trip for community members to spend time on the land; you could organize a harvesting trip with community contacts, or you could hire research assistants within the community who are interested in learning more.

- **Gathering your tools is part of the preparation.** In order to harvest, you will need the correct tools for the job: an axe to make a cut in the bark, gloves to help with the pulling, and a knife to separate the outer bark from the inner bark. In a research context, this may translate to ensuring you have the tools such as funding, transportation, research equipment necessary to carry out the research.

- **When you make the first cut into the bark, you do so with respect and with the wellbeing of the tree in mind.** This is when you start to work deeply and in a focused way with the community to further develop and implement your research methods, data collection and protocols that prioritize community safety and cultural safety.

- **Understand that the tree will give you what it has to offer**. It is a cultural teaching in Sḵwx̱wú7mesh that cedar bark is a gift and that a tree will give you as much bark as you deserve based on how respectful you have been leading up to harvesting. Remember that you as a researcher do not dictate how community-based research will unfold. Your research expectations and desires will need to align with the communities' priorities and capacity. If you neglect to take the previous steps, it will be difficult when it comes time to ask the community and participants to contribute to the research if they don't feel there is a foundation of trust, transparency, respect, and cultural safety. Remember also that you are never entitled to the knowledge, culture, and traditions of the community you have partnered with.

- **Processing the bark takes many steps to complete and requires you to be attentive and responsive.** Once you pull the sléwaý the work of processing begins. Working carefully, the sléwaý (inner bark) needs to be separated from the outer bark while the sap is still wet, otherwise the sléwaý may not be fully separated from the outer bark. During research this means being attentive and responsive in your foundational work with community. Listening and being open, reflexive and transparent are important and will help in the final stages of developing the research framework in preparation for carrying out a research project.

- **Weaving the basket takes knowledge, patience, and time.** The sléwaý needs to be cured for two years, then cut length- and width-wise into strips. These strips are then soaked, and it is then that the sléwaý is ready to be woven. The basket form and design will match the material being harvested. For roots, the weave will be looser to allow for swishing the basket full of roots through the water to remove loose soil and small rocks. For berries, the weave will be tight so no precious berries fall out. Taking the time to develop a strong research framework will help you decide what kind of basket you need to co-create to hold the project and honor the community. Once the basket has been woven in this correct way, then it can be filled.

Part 2: Filling the Basket - Carrying out Community-Based Research
Once the basket is woven the next step of the model is to consider what components are harvested and placed within the wáts'iyus. The following section explores this from a Sḵwx̱wú7mesh perspective, using plant metaphors for the T'kw'ámyexw (roots), Spéńem (plant structure), Spáḵ'em (flower), and Tewíńxw (berry). Each plant part represents an aspect of the research methods, results and deliverables from the one-year Yetwánaý Project.

T'kw'ámyexw (Roots): The Cultural and Research Foundations of the Work
Root vegetables are an invaluable source of nutrition, fiber, and healthy carbohydrates. In botanical terms, the roots stabilize the plant and draw the required nutrients and water so that the plant can grow and thrive. In the cultural context of the wáts'iyus model, the roots signify the cultural foundations on which the community-based work will grow and what culturally appropriate groundwork needs to be in place to support the renewal of cultural plant knowledge. The roots ground the project in cultural teachings, protocols, responsibilities and reciprocity (Figure 3). In the context of our Sḵwx̱wú7mesh project, our t'kw'ámyexw (roots) for the project included:

1. Grounding our research in strength-based, trauma-informed, anti-oppressive parameters. This allowed us to make space for stories and impacts related to trauma, to honour the role of trauma in health contexts, and also honour the strength and resilience of the Sḵwx̱wú7mesh people and community.

2. Identifying and integrating cultural frameworks and teachings for working with plants in the context of the project. We explored and identified what respectful, reciprocal, responsible relationships with plants might look like in the context of the project.

3. Taking a process-oriented approach and being responsive and reflexive in honouring community and project participant priorities and interests, and trusting in this process to guide the research.

4. Co-creating our definitions of culturally-grounded health and wellness with the participants.

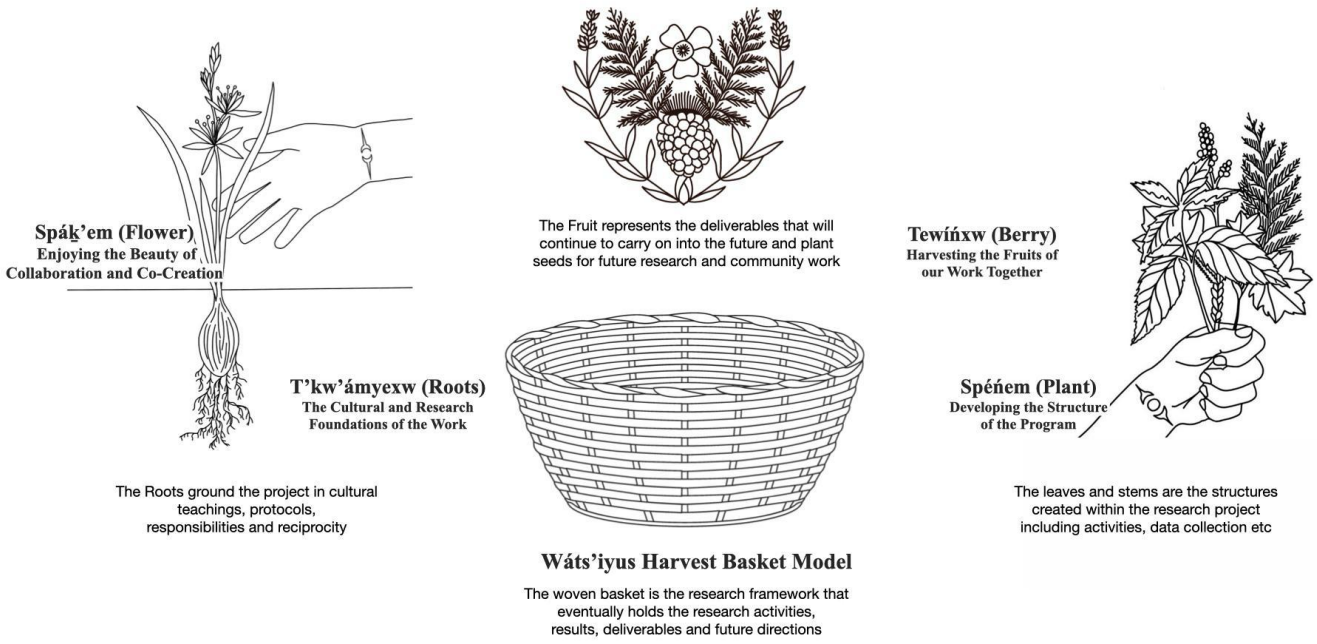

Fig.3. Illustration of the harvest basket analogy for preparing for and carrying out meaningful community-based ethnobotanical research and integrating cultural-awareness into every stage. Botanical artwork by Salish artist Ocean Hyland.

Spéńem (Plant): Developing the Structure of the Research Program

The stem and leaves of a plant create the systems for how the plant gathers energy and moves nutrients from the roots to other areas in the plant. The leaves and stems are the structures created within the research project including community activities and data collection (Figure 3). This is where we chose to take a land-based and hands-on approach to learning about plants in the context of integrating Indigenized approaches to the prevention and management of Type 2 Diabetes. The structure of our program was to meet regularly as a group, take a monthly land-based, full-day harvesting trip and workshops, and hold broader community events throughout the course of the one-year program.

Spáḵ'em (Flower): Enjoying the Beauty of Collaboration and Co-Creation

The Spáḵ'em **(**flower) is the fertile stage of the plant's life cycle, where it mobilizes strategies for growth and longevity. There is beauty and function in this stage of a plant life cycle, and

relationships are key with pollinators and other life that relies on flowering plants. The flower represents the stage in our research where we looked for the ways to realize the beauty of our shared efforts and co-creation as a group (Figure 3). For example, we explored creating recipes with the plants that we learned about and harvested together as a group, and we started to develop a plant field guide/recipe book to record the shared experiences of our group. The joy we experienced simply sharing time together on the land and through the sessions came through in these moments.

Tewíńxw (Berry): Harvesting the Fruits of our Work Together

This is the stage in a plant life cycle when the flowers mature into fruit that carries the seeds of future generations of the plant. This is where the genetic diversity of a plant is held, and again there is an element of relationship with animals and humans who harvest and eat the seeds and disperse them away from the parent plant. The Fruit represents the community-facing deliverables that will continue to carry on into the future and plant seeds for future research and community work (Figure 3). In the Yetwánaý Project, these deliverables, or "fruits" were manifested as a plant book with key information on plant identification, as well as recipes; a series of online and land-based plant workshops for Sḵwx̱wú7mesh youth; and a short film. These deliverables are meant to plant the seed for the continued work of knowledge renewal in connection to culturally important plants. This Wáts'iyus Harvest Basket Model is also a "fruit" of the process, disseminating the learnings far and wide and helping to plant new life in other parts of the ethnobotanical research ecosystem.

In conclusion, the first steps of the Wáts'iyus Harvest Basket Model was to weave the basket, or research framework. The second step was to fill the basket with culturally grounded and informed community-based research.

Section 4: Conclusion and Future Directions

In this paper we have explored colonial contexts and impacts on Indigenous plant knowledge, access, and relationships (Coulthard and Simpson, 2016; Joseph *et.al*., 2022; Smith, 2012; Kimmerer, 2013). As a means to begin countering these colonial legacies, as they are manifest in the epidemic of Type 2 Diabetes in Indigenous communities, we offer one means of contributing to the prevention and management of this disease by establishing a reciprocal, respectful ethnobotanical research partnership with the Sḵwx̱wú7mesh community. We have emphasized the importance of working in culturally informed ways to develop an indigenized research model that is responsive to community priorities, values, and voices. This model follows an ethnobotanical metaphor of a basket that is filled with plants, flowers and fruits and is meant to offer a framework that can be applied and tailored for use in other Indigenous communities. The harvest basket methodology starts by identifying the key materials required to weave the basket (the research model that fits a communities' needs and priorities) and then collaboratively collecting the roots, leaves, flowers and fruit of a research project (the methods, results, deliverable, future directions) together with the community to add to that basket. To conclude, we offer some of the key practices learned from this study, which we refer to as wise practices. Then also speak to the cultural teaching of Eséḿḵwu,that helped to create the framework we have developed in this paper, and the role of humor in Indigenous community-based research.

What we would do differently

One aspect of the Yetwánaý Project where we experienced barriers was in participant recruitment. While there were many community consultations leading up to the project, and a lot of interest in the subject and focus of the research, it was a challenge to get people to sign up for the core participant group. We ended up with 8 regular community members who stayed with the program for the duration, and a much higher number of attendees at our community events (160-200+). We also saw a higher number of people turn out for the harvesting days and hands-on workshop days. In reflecting on the possible barriers to participation, we have the following two insights.

First, we could have removed the Type 2 Diabetes quasi requirement, framed the project more clearly in "plant knowledge renewal for health," and included context on T2D for participants who were interested. The reluctance for some community members to sign up for the program may have been due in part to the history of T2D interventions that have led to internalized shame about the disease and its high level of occurrence in Indigenous communities without acknowledging the contexts of systemic racism and the ongoing impacts of colonization.

Second, we could have partnered with more established programs in the community to augment their existing work (e.g., the Healthy Family program, the Elders program, Cultural Journeys school program). This would have meant that we could find times when they were already meeting and offer hands-on learning experiences at the same time as not adding more pressure on to peoples' schedules.

Wise Practices

From the richness of the participant insights gathered throughout the Yetwánaý Project, we offer the following wise practices for all researchers—Indigenous and non-Indigenous—to consider and implement into their research approaches:

1. Combine movement, land, and family/community connections when developing health- and wellness-based programming and research.

2. Prioritize hands-on, experiential, and land-based research activities as much as possible.

3. Make time for celebration and look for ways to centre joyfulness in the research work.

4. Develop a reflexive research practice that is grounded in the historical and ongoing impacts of colonization and systemic racism.

5. Acknowledge and remove racist biomedical approaches, biases, and deficit-based mindsets from your research practice.

6. Ensure communities have clear understanding of benefits and drawbacks to the research before consenting to the work; ensure ongoing opportunities for consent at all stages of the research.

7. Take your cues from community at all stages of the research project, including in conceptualizing the project itself.

8. Adopt a holistic approach to health and wellness in which to ground your research, without appropriating or pan-Indigenizing Indigenous conceptualizations of health and wellness.

9. Deprioritize biomedical plant knowledge research (especially if communities are pointing to a different research direction).

10. Consider the legacy of pharmaceutical extraction and the Western academic tendency to further one's career over prioritizing community needs in your journey as a researcher.

11. Employ process-based research approaches that allow you to stay responsive to current events/realities of Indigenous partner communities and allow you to enact Indigenous ways of being and doing work.

12. Prioritize participant safety and reduction of barriers and triggers in all research work; do the inner work needed to become a safe(r) researcher to partner with.

13. Develop project budgets that include significant resources to remove immediate barriers to Indigenous community participation (e.g., childcare, transportation support, honoraria).

14. Consider other barriers to participation that are harder to eradicate, such as shame, fear, stigma about participating in health research for specific illnesses.

15. Use academic/institutional power to change internal policies and redirect resources to Indigenous partners including beyond the end of research project/grant cycles.

16. Work with Indigenous communities to identify partners in research who are safe, culturally informed, and ready to exchange knowledge and learning (i.e., not just deliver their knowledge without valuing what Indigenous worldviews can teach them).

17. Where possible, partner with existing community-based programs to reduce scheduling challenges.

18. Resource Indigenous researchers respectfully, trust them to guide the work in culturally relevant ways, and support them to learn from other Indigenous researchers in Indigenous-only spaces.

19. Do not expect Indigenous communities to share their culture and knowledge with you freely (whether you are Indigenous or not).

These wise practices can support future community-based ethnobotanical research projects and collaborations within and in partnership with Indigenous communities and are based on the foundations of our year-long pilot project.

Concepts to Carry into the Future

The following concepts and teachings are ones that we reflected on in the context of the current research and writing this paper. It was important for us to leave the reader with these important and uplifting culturally-grounded teachings that we hope will inspire future ethnobotanical research projects to follow cultural practices that uphold healing, strength and identity.

Eséḿk̲wu: To Be Wrapped in a Blanket

To be eséḿk̲wu (eh-swem-quo) in the Sḵwx̲wú7mesh language translates to being wrapped in a blanket which is connected to ceremonies where blankets are used metaphorically and literally to protect participants by wrapping them or having them stand on blankets laid out on the ground as a way to uplift, support and protect them while they are engaged in ceremony. Eséḿk̲wu also means to be held and protected. By thinking about this concept in connection to the research model we present in this paper, we want to communicate that eséḿk̲wu is the way that we intended for research participants to feel. To feel held, seen and safe in the research process. This concept can be applied as a foundational guideline and culturally grounded metric to ensure the research process and practices ultimately lead to participants and community members feeling that they are held, seen and protected. In the context of research this is important given the difficult history of extractive and dehumanizing research with Indigenous communities and although being eséḿk̲wu is part of Sḵwx̲wú7mesh cultural teachings they are likely similar concepts across the diversity of Indigenous communities in North America and globally.

The Role of Joy, Laughter and Humor in Indigenous Community-based Research

There is a long history of research involving Indigenous communities that focuses primarily on trauma narratives and much of this research has been carried out by non-indigenous researchers. In the current paper we emphasize the critical importance of approaching community-based ethnobotanical research with Indigenous communities in respectful, responsible and reciprocal ways from inception, to securing funding, through carrying out research, to completion and dissemination of the research. The history of Indigenous communities being over researched along with being subjected to unethical, exploitative and extractive research at the hands of academic institutions and non-indigenous researchers, has led to mistrust and exhaustion in many communities. We posit that considering the role of joy in research and how that explicitly resists rationalist/neutral research paradigms, can help to shift the power dynamics within your research relationships and create an environment that can help put people more at ease.

As Indigenous people, and non-Indigenous people who have long worked with community, we have witnessed first-hand the role of humor, laughter and joy within our own families and communities and other Indigenous communities we have worked with. These are critical observations in the context of healing from intergenerational trauma and overcoming trauma related to settler colonialism and systemic racism. Creating space for humor, joy and connection can highlight the multidimensionality of the Indigenous community members we are working with in a research context and help support better trust and relationship building. We include the caveat that it is important not to minimize or gloss over the pain, grief and loss but it is a

reminder that Indigenous People and communities are not the sum of their trauma. The resilience within our families and communities is not separate from the grief and from the joy and strength. The suggestion is not for non-Indigenous researchers to try to create humorous research scenarios but instead to create space for community research participants to bring these experiences and emotions into the research setting. Here are some ways we carried this out within our research project:

1. When we were spending time on the land we were sure to have unstructured time for people to visit and talk.

2. We directed research resources such as funding, knowledge and capacity towards creating hands-on learning and land-based learning for people in the Sḵwx̱wú7mesh community.

3. We asked the community members what land-based activities they enjoy and would like to participate in.

4. We created lots of recipes together as a group whether it is cooking a meal or creating a plant-based wellness product such as bath soaks, salves or teas and the participants really enjoyed these activities, and they increased capacity and knowledge in connection to plants and wellness.

5. We gave space for humor, laughter and joy within your research activities knowing that the role of humor is often to aid in healing and developing a shared sense of trust and ease in research-related settings.

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Chapter 5: Reflections and Future Direction

Personal statement and Reflections

When I first started working with my community of Sḵwx̱wú7mesh on ethnobotany related work and research over fifteen years ago, my Auntie Joy explained to me that while I was gaining knowledge and expertise through my academic training, it was important that I bring that knowledge home and share it with my community and help others reconnect to plant knowledge too. As it has been outlined in my writing here, there have been many impacts on land-based knowledge and access, and in turn, impacts to Sḵwx̱wú7mesh plant knowledge. It is in the reconnection and reclamation of plant knowledge and creating opportunities for community access to plants that I have found the path towards my gift to share within my community. As an Indigenous researcher working with my own community, it was very important to have someone like my Auntie to help guide me in how to carry out this work in a good way. There are many complicated layers of past wrongs, unethical researchers, and institutional missteps when it comes to research with, or more accurately, "on", Indigenous Peoples historically (Paradies, 2016). Many of these issues are still of concern today, or at least have been until very recently. Because of this history and the ongoing mistrust and concerns many Indigenous communities have with engaging in academic research projects, it was very important that I have a community mentor and key contact that I could turn to for guidance as I walked the line between being a Squamish Nation community member, academic researcher, and an individual who was/is reconnecting to their culture through this community-based work (Joseph *et.al*., 2022).

Research Background and Context

As the planning for my doctoral project progressed, I drew on key learnings from my previous masters research with my community, and other Indigenous communities, and I continued to read and research methodologies and concepts that were in alignment with my greater goals of planning and carrying out respectful, responsible, and reciprocal community-based research. During this time, I came across Adam Gaudry's concept of Insurgent Research which carried with it many of the parameters I wanted to follow and became an important framework for my research. The key principles for Insurgent Research are (Gaudry, 2015, pg. 243-263):

1. Research is grounded in, respects, and validates Indigenous worldviews.

2. Research output is intended for use by Indigenous communities.

3. Researchers are responsible to Indigenous communities for the decisions that they make, and communities are the final judges of the validity and effectiveness of research projects.

4. Research is action oriented and inspires direct action in Indigenous communities.

Gaudry argues that these principles support engaged community-based research with Indigenous communities by helping to avoid problematic research situations where researchers do not engage the community in the development of the project; they come to the community with a rigid predetermined plan for the research without the room for reflexivity or community input.

This colonially-minded approach to research privileges institutional and researchers benefit at the expense of community needs, values, or relevance.

As such, these principles of Insurgent Research were ones I returned to throughout the project as we navigated the process-oriented approach to research. This meant that we worked together, as a process of co-discovery, towards making culturally relevant improvements to how we carried out the community-based engagement throughout the course of the research based on feedback from the participants and key community contacts. Taking this kind of approach was critical to both the academic and the on-the-ground community work in ways that allowed for more co-creation, reflexivity, and meaningful engagement throughout the project. It also prioritized the benefit and relevance of the research to the community first and foremost.

Revisiting the Research Questions

I set out to explore three interrelated research questions. In the following section I return to these questions and reflect on how these questions created the framework for my doctoral research and how I addressed them during the course of this work.

Research Question 1: Developing an Indigenizing and Decolonizing Approach to Ethnobotany
Question: How might developing an indigenizing and decolonizing approach to ethnobotany move the field forward to the benefit of the communities we work with, and situate the discipline as a positive contributor to Indigenous cultural-political resurgence in Canada?

In Chapters 2 and 3, I outlined the considerations, methodologies and frameworks for achieving these approaches within the related fields of ethnobotany and ethnobiology. Both Chapter 2 and 3 were published during the course of my research. In those papers I outlined the critical importance of researchers educating themselves on Indigenous history and context. I stated that researchers in Colonial contexts—and particularly working directly with Indigenous peoples and communities—need to develop their own critical self-awareness and educate themselves on the relevant history, issues and ongoing challenges and barriers that face Indigenous Peoples. This critical reflexiveness and self-education is an ongoing process for researchers—it is work and practice to be developed throughout their careers, and should inform not just their research, but their publications and teaching as well (Joseph, 2021; Joseph et.al., 2022).

Through these two papers, as well as in Chapter 4, I emphasized the importance of designing and implementing culturally informed research approaches that centralize community interests and priorities. Part of this last point is looking to literature from Indigenous scholars and knowledge holders to support and develop indigenized approaches to ethnobotanical research. Another priority that emerged throughout the course of my community-based research was how critical it is to provide opportunities for community members to spend time on the land, reconnecting to cultural knowledge and hands-on learning with plants.

If ethnobotanical researchers strive to follow the processes outlined in this paper and develop further resources and research frameworks that put community priorities first, this is a pathway to further the field of study being a positive contributor to Indigenous cultural-political resurgence in Canada. Contributing to an Indigenous communities' goals of knowledge renewal ultimately contributes to the broader process of cultural-political resurgence.

Research Question 2: Culturally Important Plants and a Sḵwx̱wú7mesh Sense of Health
Question: How can culturally important plants help connect a Sḵwx̱wú7mesh person's sense of health (physical, spiritual and emotional) to place? What do the connections between plants, health and place mean to the participants themselves?

Land-based Learning is Critical

One result that consistently emerged throughout the research, the analysis, and writing was that incorporating land-based learning opportunities is key to any ethnobotanical research with Indigenous communities (Kimmerer, 2013; Simpson, 20018). By offering land-based learning and experiences, community members are able to reconnect to plant identification, experience comfort and confidence on the land, develop familiarity with the land, taste and nourish themselves with plant foods and medicines, and share learning, laughter and healing on the land together. These aspects of land-based experiences amplify the benefits of the research for the participants and support the processes of cultural knowledge renewal and reclamation taking place across Indigenous communities (Coulthard, 2014; Joseph *et.al*., 2022; Kimmerer, 2013).

As an outcome of this research, and informed by my earlier and ongoing involvement facilitating land-based experiences, there are important considerations when planning these experiences:

1. Do you have permission to visit the site you have in mind?

2. Are there cultural, community or safety protocols for planning a trip to the site?

3. Do you have a community member who can help facilitate and guide the trip?

4. Does your plan for the land-based trip leave space for unstructured time or reflexivity?

5. How have you provided supports for the time on the land regarding accessibility for elders or people with physical challenges?

6. Are you providing food, water, shelter and other equipment if needed or will you coordinate with community members on this?

This is not an exhaustive list of considerations for facilitating this kind of land-based opportunity, but these are some important considerations for planning a safe, inclusive and culturally informed land-based trip. Mindful and reflexive planning means taking away the barriers that have prevented community members from being on the land, and supports those who are joining the trip to aid them in having the time and space to reconnect to the land, plants, memories and each other.

Research Question 3: Culturally important plants and Type 2 Diabetes

Question: What role do culturally important plants play in developing approaches to addressing Type 2 Diabetes from an Indigenous conceptualization of health viewpoint?

Educating Yourself/Creating Culturally Safe Research Spaces
Research involving Indigenous health requires that we, as researchers, do the work to not only inform and educate ourselves on the historical and ongoing impacts of colonization on Indigenous health, but to also further develop our own critical self-awareness. Blind spots are what I term those areas where we lack understanding, education or lived experience regarding critical issues that impact Indigenous communities. Consequently, we may have developed unconscious bias and stereotypes. Blind spots are difficult to identify until we further our own education and familiarity with experiences different than our own.

As an Indigenous person and researcher, I needed to further educate myself to develop my own critical understanding of how my fields of study—ethnobotany and ethnobiology—intersect with my personal and familial history of intergenerational trauma and systemic racism. Due to a lack of ethnobotanical literature that addressed topics like systemic racism and colonization in the context of ethnobotany, I needed to read and research outside of my field into the disciplines of Indigenous Studies, Education, Health and Law literature to help further develop my ability to understand the interconnections between colonization and current day issues that impact Indigenous Peoples in the area now known as North America. All researchers working with Indigenous communities can benefit from furthering their own critical self-awareness. The following is a reference tool I developed during the writing of my comprehensive exam and it is helpful in outlining some of the ways we can further develop our critical awareness in connection to working with Indigenous communities.

Developing a Critical Self-Reflection Toolkit
Table 1, below, provides definitions and concepts to support in the process of critical self-reflection within the context of working with Indigenous Communities in the field of ethnobotany. Taking the time and energy to reflect on these concepts is an act of solidarity, respect and caring towards Indigenous Peoples and Communities.

Engaging with the following concepts and furthering your own understanding can help to deepen your self-education about factors that shape our society and directly impact Indigenous Peoples: a) the ability to know and understand impacts of colonization on Indigenous Peoples in Canada; b) the insight and ability to see how systemic discrimination is matched by systemic privilege c) the ability to see many different types of systems of privilege (McIntosh 1988).

Table 1 is a resource and a quick reference guide for becoming more familiar with terminology and concepts that will come up in literature and discussions related to critical awareness and critical self-reflection.

Table.1. Terminology to support the process of critical reflection on the field of ethnobotany and critical self-reflection in the context of working with Indigenous communities in relation to ethnobotany.

Racism	**"But race is the child of racism, not the father"** (Coates 2015, pg.7) Racism is an ideological construct rooted in Eurocentric worldview and experience designed to uphold beliefs in white superiority and to justify inequality between people of color and dominant white society. Racism assigns the blame and judgment to the very people shouldering the associated discrimination, violence and inequality.
Everyday Racism	Everyday racism is often subtle, making it more difficult to define or pinpoint than clear manifestations of overt and systemic racism. The recognition of this form of racism by people of color is often undermined. Some examples of everyday racism include: being told, "I have friends who are (insert color here)" to justify racist comments, jokes or behaviors; being followed around a store in the assumption that because of the color of your skin you cannot be trusted; having the police called on you simply for being in a space that others deem not appropriate or allowable; having higher probability of being arrested when that call is made; being treated with violence or assumed to be guilty of a crime; being congratulated for elevating yourself above your people by being accomplished; being made invisible in society so that people don't need to face their own lack of understanding or education about colonial past or be uncomfortable; and being blamed for the violence against your own people.
Privilege	Privilege is a right, immunity or benefit enjoyed by a person beyond the advantage of most. Privilege is an unearned advantage. No one is to blame for the privilege they carry but there is a responsibility to understand your own privilege in order to use it for good. A common misconception exemplified by the "bootstrap" mentality asserts every person regardless of race, gender, sexuality or disability has the same chance of success if they just work hard enough. By default this assertion assumes every person is starting from the same starting point and that we are all on an even playing field. However privilege gives some people in society unearned advantages that either advance the starting line for them or remove barriers along their path. It is often the most difficult task to identify and explore our own privileges and where our blind spots are. White privilege is the unearned privilege that comes with being born white into a society that is designed to help you succeed (Regan 2010, Diangelo 2018).

White Fragility/Vulnerability	This term is often met initially with discomfort and defensiveness. Author Robin DiAngelo writes "White people in North America live in a society that is deeply separate and unequal by race, and white people are the beneficiaries of that separation and inequality." DiAngelo continues from her perspective as a white woman referring to 'we' meaning white people "as a result, we are insulated from racial stress, at the same time that we come to feel entitled to and deserving of our advantage. Given how seldom we experience racial discomfort in a society we dominate, we haven't had to build our racial stamina. Socialized into a deeply internalized sense of superiority that we either are unaware of or can never admit to ourselves, we become highly fragile in conversations about race. We consider a challenge to our racial worldviews as a challenge to our very identities as good, moral people…The smallest amount of racial stress is intolerable – the mere suggestion that being white has meaning often triggers a range of defensive responses…. I conceptualize this process as white fragility. Though white fragility is triggered by discomfort and anxiety, it is born of superiority and entitlement. White fragility is not weakness per se. In fact, it is a powerful means of white racial control and the protection of white advantage" (2018, pp. 1-2).
Unconscious Bias	Are learned stereotypes that are automatic, unintentional, deeply ingrained, and are able to influence one's behaviour.
Burden of Representation	This is when the burden is placed on an individual of a marginalized or minority group to represent his or her entire identity group in daily life, research, art, or media. When there are not many representations of a particular group to draw on, and most of the representations are negative, there will be a higher likelihood that a person will be associated with the negative perceptions linked to their identity.
Positionality	A term used to describe and delineate one's position in relation to others, including research participants (Heaslip 2014). Positionality includes consideration of the intersections an individual has with regards to cultural identity/race, gender, social class and ability. Understanding one's positionality requires that we understand what privilege we carry, what biases we have and how these play out in our beliefs and behaviors as individuals, educators and researchers. For example, my positionality includes that I am a cis gendered able-bodied woman who has mixed Indigenous and white ancestry. I come from a middle-class family and I have had access to post-secondary education. All of these factors influence how I am situated when I enter into my own, or other, Indigenous Communities as an ethnobotanist and researcher.
Decolonization	The bureaucratic, cultural, linguistic and psychological divesting of colonial power. Decolonization restores Indigenous worldview and culture and replaces Western interpretations of history with Indigenous perspectives of history. Decolonization is about shifting the way Indigenous Peoples view themselves as well as how non-Indigenous people view them.

Indigenization	Indigenization recognizes validity of Indigenous worldviews, knowledge and perspectives and identifies opportunities for indigeneity to be expressed. Indigenization incorporates Indigenous ways of knowing and doing. Indigenization requires non-Indigenous people to be aware of Indigenous worldviews and to respect that those worldviews are equal to other views. Indigenization is about incorporating Indigenous worldviews, knowledge and perspectives into the education system, right from primary grades to universities. (Joseph 2018).
Indigenous Worldview	Indigenous knowledge is evaluated according to Indigenous standards, meaning the validity of knowledge and experience is judged from within its own worldview, not foreign standards. This means that Indigenous knowledges are not subjected to outside standards of scrutiny, nor do they require justification from within Western knowledge system to be considered valid.
Allyship	An active, consistent, and arduous practice of unlearning and re-evaluating, in which a person in a position of privilege and power seeks to operate in solidarity with a marginalized group. Allyship is not an identity—it is a lifelong process of building relationships based on trust, consistency, and accountability with marginalized individuals and/or groups of people. Allyship is not self-defined—our work and our efforts must be recognized by the people we seek to ally ourselves with and it is important to be intentional in how we frame the work we do (Anti-oppression Network 2016).

Wise Practices: What we learned from the Yetwánaý Community-Based Field Research

Based on the participant insights gathered throughout the one year, land-based Yetwánaý pilot project (CH 1), we offer what we term as "wise practices" for all researchers—Indigenous and non-Indigenous—to consider and implement into their research approaches.

In Chapter 2, *Walking on Our Lands Again: Turning to Culturally Important Plants and Indigenous Conceptualizations of Health in a time of Cultural and Political Resurgence,*I had the following key findings:

1. Identify and follow the protocols for the specific Indigenous individual, family, and community you are working with.

2. Understand that your timeline is not necessarily a community priority. Be prepared to balance the necessity of meeting your institutional and funding requirements with the equal necessity of maintaining a respectful engagement with community.

3. Start by listening and developing relationships. Relationship-building requires being present in the community in ways that may also mean offering to help with other and unrelated work that needs doing (e.g., making tea, cutting wood, cleaning the yard, processing food).

4. Develop a relationship with someone in the community who is willing and, in a position, to give you guidance and act as a point person. Be mindful that the first person to surface is not necessarily the best fit. Look to Elders, community leaders, and department heads.

5. If you are not sure, ask, particularly when it comes to protocol, gift giving, respectful behaviour, attending ceremonies, or recording information.

6. Have a foundational understanding of the history of the community you are working in, the impacts of colonization and to continue to develop your understanding of the far-reaching impact of historical processes. Be aware of current challenges faced by Indigenous people so that you can work in a more engaged and respectful way.

7. Do not publish, present, or in any way share Indigenous knowledge without community consultation and explicit permission.

8. Follow Ownership, Control, Access and Possession (OCAP) guidelines as a standard when working with Indigenous Knowledge (First Nations Information Governance Centre, 2023). Disseminate your findings in a way that contributes directly to the community you are working with. Always credit individuals for their knowledge and contribution (unless they specify anonymity); recognize that any non-indigenous scholar is writing from an outsider perspective and that it is important to incorporate Indigenous voices and perspectives into your writing and also to consider writing from a place of critical reflection.

9. Be cautious of overburdening individuals or departments within the community you work with. Often the most culturally active people are the busiest. Consider how much energy, time, and space you take away from people and resources that are dedicated to community and remunerate people for their time. Be aware that Elders should be remunerated at a higher rate for their time due to their status within community. Ask if the community has a remuneration structure already in place. If not, co-develop one with the community.

10. Gift giving and reciprocity is a central teaching across many Indigenous Communities. The practices vary but giving back and redistributing wealth in the form of Indigenous foods, plant medicines, or other gifts is deeply appreciated, enacts reciprocity, and honours the mutually beneficial nature of a healthy research relationship.

11. Give back. If your research deals with Indigenous knowledge, culturally important species, or cultural keystone places" (Cuerrier et.al., 2015), be sure to share your research privilege and resources by offering opportunities for Indigenous community members to engage with and (re)connect to the subject of your research. This may include capacity

building through training community members, conducting meaningful knowledge translation of practical and tangible results that community may integrate into programs and decision making.

From my second paper Shifting Narratives, Recognizing Resilience: Taking Anti-Oppressive and Decolonial Approaches to Ethnobotanical Research with Indigenous Communities in Canada I had the following takeaways.

Significant Learnings: Results of the Yetwánaý Project
The following are the major results from the Yetwánaý program:

1. Follow cultural teachings. Each of our group sessions started and ended with a circle which was one of the cultural protocols that our participants advocated for and that we incorporated from the start. This practice led to people feeling comfortable and grounded during each session.

2. Leave ample space for conversation and reflection. All of our sessions had specific time built in for participant-led conversations and reflections. This evened out the power differential between the facilitators and the participants and created an environment where we were all learning from each other.

3. Spend as much time on the land as possible. The land-based sessions were by far the most valued sessions by our participants. Shifting learning out onto the land is a profound way to teach about, and reconnect with, culturally important plants.

4. Bring culturally important plants into learning spaces as often as possible. Some examples of this are, bringing in potted plants so people can become familiar with plant identification, bringing in dried plant ingredients and blending tea, you could bring in beautiful colour photographs of plants, make a salve or infused oil with plant ingredients. All of these acts help to rebuild relationships in experiential ways.

5. Learn to make things with plants. Our participants loved the sessions where we identified, harvested, processed and then made something with a particular plant. For example, during Oregon grape season we identified the plant in the field, spoke about the cultural relationships with the plant, sustainably harvested the fruit and then brought it back to the kitchen at the community hall and made and jarred Oregon grape concentrate to be used through the winter months and added to water or smoothies.

From my third paper Wáts'iyus Harvest Basket Model: Turning to Ancestral Plant Knowledge to Develop Indigenized Strategies Towards the Prevention and Management of Type 2 Diabetes: A Sḵwx̱wú7mesh (Squamish) Nation Case Study we identified the following key takeaways.

Wise Practices: Feedback from Participants and Research Findings from the Yetwánaý Project
1. Combine movement, land, and family/community connections when developing health- and wellness-based programming and research.

2. Prioritize hands-on, experiential, and land-based research activities as much as possible.

3. Make time for celebration and look for ways to center joyfulness in the research work.

4. Develop a reflexive research practice that is grounded in the historical and ongoing impacts of colonization and systemic racism.

5. Acknowledge and remove racist biomedical approaches, biases, and deficit-based mindsets from your research practice.

6. Ensure communities have clear understanding of benefits and drawbacks to the research before consenting to the work; ensure ongoing opportunities for consent at all stages of the research.

7. Take your cues from community at all stages of the research project, including in conceptualizing the project itself.

8. Adopt a holistic approach to health and wellness in which to ground your research, without appropriating or pan-Indigenizing Indigenous conceptualizations of health and wellness.

9. Deprioritize biomedical plant knowledge research (especially if communities are pointing to a different research direction).

10. Consider the legacy of pharmaceutical extraction and the Western academic tendency to further one's career over prioritizing community needs in your journey as a researcher.

11. Employ process-based research approaches that allow you to stay responsive to current events/realities of Indigenous partner communities and allow you to enact Indigenous ways of being and doing work.

12. Prioritize participant safety and reduction of barriers and triggers in all research work; do the inner work needed to become a safe(r) researcher to partner with.

13. Develop project budgets that include significant resources to remove immediate barriers to Indigenous community participation (e.g., child care, transportation support, honoraria).

14. Consider other barriers to participation that are harder to eradicate, such as shame, fear, stigma about participating in health research for specific illnesses.

15. Use academic/institutional power to change internal policies and redirect resources to Indigenous partners including beyond the end of research project/grant cycles.

16. Work with Indigenous communities to identify partners in research who are safe, culturally informed, and ready to exchange knowledge and learning (i.e., not just deliver their knowledge without valuing what Indigenous worldviews can teach them).

17. Where possible, partner with existing community-based programs to reduce scheduling challenges.

18. Resource Indigenous researchers respectfully, trust them to guide the work in culturally-relevant ways, and support them to learn from other Indigenous researchers in Indigenous-only spaces.

19. Do not expect Indigenous communities to share their culture and knowledge with you freely (whether you are Indigenous or not).

Limitations of the study

Participant recruitment varied between being very successful for land-based and hands-on learning but challenging for more traditional Western research related activities including workshops, surveys, and interviews. While there were five community consultations leading up to the project, and significant interest in the subject and focus of the research, it was a challenge to get people to sign up for the core participant group. We ended up with eight regular community members who stayed with the program throughout, and a much higher number of attendees at our community events (160-200+). We also saw great interest in participating in the harvesting days and hands-on workshop events.

The Sḵwx̱wú7mesh community feedback was clear in what aspects of the Yetwánaý project were a barrier for them. Most significantly would have been shifting our focus away from Type 2 Diabetes specifically towards framing the project more clearly in "plant knowledge renewal for health." This would have made the program more approachable. We could still have included context on T2D for participants who were interested in taking this approach, and in practice, the program did follow this layout of focusing on plants and related knowledge first and applications for health and specifically T2D second. However, the reluctance for some community members to sign up for the program may have been due in part to the history of T2D interventions that have led to internalized shame about the disease and its high level of occurrence in Indigenous communities without acknowledging the contexts of systemic racism and the ongoing impacts of colonization (Paradies, 2016). This highlights the need for more culturally grounded health interventions and community-guided approaches to addressing T2D.

Partnering with established community programs would have been another effective way to reduce barriers for participation in this project. This could have simply augmented existing community work; for example, the Healthy Family Program, the Elders Program, or the Cultural Journeys school program. Asking the participants to meet outside of their jobs and other life commitments was a significant barrier in the research. Finding times when groups were already meeting, and offering hands-on learning experiences at the same time, would have alleviated this pressure on people's schedules. Despite this, it was positive to have continuity of participants across the entirety of the pilot project.

COVID-19

As previously mentioned, our one-year Yetwánaý research program was disrupted by the global COVID-19 epidemic. Consequently, we had to stop our in-person gatherings and facilitation,

which disrupted our group time on the land. During this time of great uncertainty and upheaval we consulted our participants and the community research committee, and our community participants, and it was decided that our team would turn our focus to preparing a plant book that incorporated information on plant identification, habitat, cultural relationships and recipes for how to utilize plants as food and medicine. We are currently finalizing this community version of this book and will distribute the manuscript to key community partners in the Squamish Nation, including our planning committee, our participants, the cultural journeys school program, the elders program, the healthy families program and we will offer virtual and written opportunities to give feedback on the plant field guide and plant recipe sections. The recipes include both topical preparations such as salves, infused oils, bath soak blends and food recipes that look at incorporating Indigenous plants into healthy, straightforward recipes to support health. In addition to this I published the book *Held By the Land: Indigenous Plants for Wellness* (Joseph, 2023). This publication fills a gap that was identified through the broader course of my academic experiences and research. While COVID-19 forced a change in the way we carried out this research, in turn we responded as a community to accelerate the production of key resources to support ways for the community to connect to plants past the end of my doctoral research.

Reflections and Future Research

The intergenerational effects of colonialism have created significant barriers to Sḵwx̱wú7mesh plant knowledge. These effects are broad and encompassing, including challenges around the knowledge of where to go, what spaces are safe for harvesting, how to properly identify plants, how to gather plants, and how to harvest sustainably (e.g., what the limits are for gathering plants without harming the plants' survival, how often to harvest and when). It is this challenge that was and is at the heart of my doctoral work in the sense of highlighting the impacts of colonization on plant knowledge and access but also on finding culturally-informed ways to rebuild this knowledge and related land-based experiences in order to rebuild confidence in working with culturally-important plants. So in the end this challenge also presented an opportunity.

Being able to draw on participant guidance and feedback gave us a chance to be reflexive through the course of the community-based on the land plant knowledge renewal program we were co-creating with our group of community members. Some key considerations that came from this pilot project were to check in often with the group, build in time/capacity for reflexivity, center the community members in the project at all times, bring together a community advisory group to turn to for guidance throughout all stages of the project. Though it may feel daunting to centralize community member's experiences and feedback over funding deadlines and other external factors, this is a truer path to engaged anti-oppressive research and will likely require you to advocate for the community within your institution so as to create the space for meaningful changes to how we conduct community-based ethnobotanical research.

My doctoral research demonstrated that there is a keen interest and desire for the Sḵwx̱wú7mesh community to engage in more land-based opportunities to learn from culturally important plants. This echoes the work of other Indigenous ethnobotany scholars, such as Kimmerer (2002, 2013) and Geniusz (2015**)**. Future research projects could build connections between existing programs and community organizations to share in the knowledge renewal and integrate learning more

broadly across the community (Cuerrier, 2015; Joseph, 2012, 2022; Simpson, 2017). Having more visual resources such as posters, seasonal harvest round diagrams, plant field guides and cards for use on the land would all contribute greatly to the community and would benefit future generations through supporting knowledge renewal. Research findings and results could also be utilized to design educational resources for schools.

This research demonstrates the effectiveness of anti-oppressive, decolonial and strength-based approaches to ethnobotany and ethnoecology. Approached this way, these disciplines have the potential to contribute to cultural revitalization and knowledge renewal. Engaging community members from the start of the project and mobilizing the privilege we carry to both give back and contribute to drawing on the capacity in mindful ways within the community will further support the move towards Indigenous research self-sufficiency and data sovereignty (Gaudry, 2015, De Leeuw et.al.,2012, Geniusz, 2009, Kukutai and Taylor, 2016). As researchers it is important to continue to develop our own critical self-reflection tools that can be revisited throughout community-based research with different Indigenous communities and can provide a framework that can be added to throughout our careers as we strive to do better in the areas of anti-oppressive, decolonial and strength-based approaches to ethnobotanical research.

There are many opportunities for Indigenous researchers and non-Indigenous researchers alike to advocate for, practice, and continue to advance respectful, responsible and reciprocal community-based research with the Indigenous community. The strength and beauty of this field are only amplified and made more poignant by prioritizing time spent on the land and holding space for the individuals, families and communities we work with to reconnect to the land, plants and all that feeds and supports Indigenous health and wellness practices.

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