Traditional Ecological Knowledge in Indigenous Language Revitalization

By
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We acknowledge and respect the Lək̓ʷəŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Lək̓ʷəŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.

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Abstract

Traditional Ecological Knowledge (TEK) is the knowledge and understanding of the complex systems of local ecology. Indigenous Language Revitalization (ILR) is a movement against the shifting use of a language within its particular community. Both languages and TEK are passed by intergenerational instruction and carried by each specific culture. This thesis explores how ILR and TEK are interconnected in many ways, including in language lessons (both method and content), in understanding worldviews which provide conceptual foundations in language, in language reclamation, and in understanding the land. This thesis follows an Indigenist paradigm and uses the structure of Parker (2012) to answer the following questions: how do communities include TEK in their language revitalization work? What are some of the effects of including TEK in Indigenous language revitalization work? What about TEK is important to language revitalization? To answer these questions, the thesis includes a review of the literature, interviews with Indigenous experts, a website survey and finally, a usable resource. The literature review contains analysis of extant literature. Interviews with experts who have been involved in the work of incorporating TEK in ILR in four Indigenous languages brings additional insight through their greater depth of knowledge, experience and perspective. The website survey contains an analysis of community ILR websites which correspond to the languages spoken by the interviewees. Finally, the creation of a resource ensures that this research is reciprocal. This study contributes to our knowledge of how TEK and ILR are intertwined, and underscores the importance of incorporating, respecting, and recognizing TEK in ILR.

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Acknowledgements

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1. Introduction

Language revitalization is an ever-growing, global movement against the changes of language shift (Hinton & Hale, 2001; Grenoble, & Whaley, 2005). Around the world, Indigenous language loss is a concern. With the loss of languages comes the loss of thousands of years of music, stories, ways of knowing, ecological knowledge, and more (Requesens-Galnares & United Nations Department of Economic and Social Affairs, 2023). Indigenous Language Revitalization movements and awareness and has grown more and more in recent years. From 2022-2032 is the United Nations Internation Decade of Indigenous Languages. Article 13 of the UN Declaration on the Rights of Indigenous Peoples assures,

> "Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons" (United Nations, 2007, p. 12)

This movement can include expanding domains where language is spoken, increasing the number of speakers, language documentation, and more (Hinton & Hale, 2001; Hermes, Bang, & Marin, 2012; Grenoble, & Whaley, 2005). One goal of language revitalization is decolonizing instruction to work against the devastating effects of colonialism (Battiste & Henderson, 2000; Skutnabb-Kangas, 2009).

Language carries more than grammar with it. Languages and cultures are inseparably enmeshed; languages, in addition to holding cultural and spiritual knowledge and importance, carry millennia of Traditional Ecological Knowledge (TEK), from medicines to place names to hunting, harvesting, or growing foods. Traditional Ecological Knowledge (TEK) is the

knowledge and understanding of the complex systems of local ecology. Indigenous Language Revitalization (ILR) is a movement against the shifting use of a language within its particular community. Both languages and TEK are passed by generational instruction and carried by each specific culture. In this thesis it is argued that ILR and TEK are interconnected in many ways, including in language lessons (both method and content), in understanding worldviews which provide conceptual foundations in language, in language reclamation, and in understanding the land. Languages hold knowledge about the land and speakers' interactions with the land, built from generation upon generation of existing with, in, and on the land. Language revitalization movements combat language loss and the loss of knowledge of nature – but this is a symbiotic relationship. TEK is inseparably entwined with Indigenous Language Revitalization around the world, from language-oriented nature walks (Hermes, Engman, Meixi, & McKenzie 2021) to teaching traditional foods and methods of food preparation (Melzer 2014). Linguistic work, particularly in documentation, has been shown to offer insights in biological taxonomy, species identification, and more (Holton 2012, 2018). Likewise, language documentation is enriched by the inclusion of TEK: "one quickly encounters questions of kinship, plant usage, biological taxonomy, place names—questions which are sometimes argued to lie outside the narrow domain of linguistics" (Holton, 2018, p. 739). By looking for the influence of TEK in language work, we may find that "young language activists find themselves looking to the land for clues about the language, rather than the other way around" (Hermes & Engman, 2021, p. 101), and that the support of that land-language connection may foster a stronger command of a threatened language.

There remain many questions about this interaction: How do communities include TEK in their revitalization work? Why is it important to include TEK in language revitalization? What

are the effects of including TEK in Indigenous Language Revitalization work? The goal of this research is to answer these questions by undertaking a literature review and interviews with Indigenous community members involved with language reclamation or Traditional Ecological Knowledge, with the goal of creating a usable resource in order to share the knowledge I've learned back with the community of experts. The research presented here shows how deeply interconnected TEK and ILR are and in how many ways, from methods and contents in language lessons, to creating a deeper understanding of worldview, to furthering language reclamation and connection to identity, to furthering understanding of worldview and conceptual understandings in language, and understanding relationality and one's relationship with the land.

1.1 Project Structure

The components of this thesis are the literature review, the interviews, the website survey, and the final resource. In this thesis, the literature review and web survey provide a base of knowledge. The body of literature on ILR is broad with seminal texts such as *the Green Book of Language Revitalization in Practice* (Hinton & Hale, 2001); the literature on TEK is likewise broad. However, the literature at the intersection of those two topics is narrower. There is much written about the benefits TEK can have during the language documentation process, and about connection to the land for language revitalization; however, there is little dialogue between these two ideas. The general goal of the literature review was to synthesize the extant texts and identify gaps in the literature. Some of the material necessary to bridge these topics was collected from a survey of community websites. Remaining gaps in understanding were filled via interviews with experts who are involved in Indigenous Language Revitalization and TEK. Interviewing Indigenous experts provides a further level of insight, as experts who are currently involved in this work have a deep understanding of and connection to it. It is of central

importance to keep the experiences and perspectives of those involved in the work at the forefront of this project. Finally, the creation of a usable guide or resource will bring the first two parts together and ensure that this research benefits others**.** Those who wish to integrate Traditional Ecological Knowledge (TEK) into their language lessons may in this way draw upon others' experience. It is important to acknowledge the caveat that there is huge diversity in the Indigenous peoples of North America and the world; to believe Indigeneity is a monolith would be a fallacy. Although steps have been made to include a broad range of sources and take into consideration this diversity, this research may not apply specifically to each and every culture. The global lens of this research endeavours to ensure that this research applies to many different peoples and situations, hopefully aiding a diverse and growing world-wide movement.

1.2 What is Indigenous Language Revitalization?

What is Indigenous language revitalization? Or, more properly, how is Indigenous language revitalization defined in this project? It is

> "the development of programs that result in re-establishing a language which has ceased being the language of communication in the speech community and bringing it back into full use in all walks of life…"Revitalization" can also begin with a less extreme state of loss…such as the loss of domains of vocabulary" (Hinton, 2001, p. 5).

The corresponding revitalization may begin with a single person, or it may be a larger, community effort. There are many approaches to revitalising an Indigenous language, which vary greatly depending on the language situation. These can include language documentation, the development of dictionaries and grammars, and the development of curricula and language lessons, whether that be in the home, after school, or in school, for adults, children, or families

(Hinton, 2001; Grenoble & Whaley, 2005). The home is a powerful place to learn one's language, and language transmission "will only be achieved by facilitating interaction between generations" (Hermes, 2022, p. 26). Instruction outside of the home may include language camps, immersion schools, and continuing education classes. There may be online resources created as well: recordings and instructional videos abound. Use of Indigenous languages in the media, such as Irish language radio or television programs, spreads awareness and enthusiasm.

It is important to note *why* many languages are fading all over the world. The oppression of Indigenous languages is something which has continued for centuries, often as a weapon of colonization and cultural genocide (Skutnabb-Kangas, 2009). Tools used to suppress language include residential schools and language and culture bans. This is a global phenomenon; not a continent is untouched.

1.3 Indigenous Language reclamation

Language reclamation is "a larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives" (Leonard, 2012, p. 359). It is distinct from language revitalization, as **"**reclamation more strongly links language work with the underlying causes of language shift" (Leonard, 2017, p. 19). Learning a language helps learners feel connected to a sense of place, a sense of self. Cutting off a language is cutting off history and community. People connect to their culture, their identities, and their families when they use their language. Loss of language results in loss of music, stories, knowledge systems, and other cultural knowledge in each community (Hinton & Hale, 2001). Reclamation and revitalization of Indigenous languages maintain a diversity of knowledge systems and ways of looking at the world.

1.4 How is Traditional Ecological Knowledge defined in this work?

Traditional Ecological Knowledge (TEK) is a broad and sweeping term, but in this thesis it refers to the way in which communities and people interact with the land around them. Like language, TEK relies on intergenerational transmission to be passed on. TEK is knowledge which has been formed over millennia of interaction and familiarity with the land performed over generations. Other words for TEK include Indigenous Ecological Knowledge. TEK refers to the historic knowledge of Indigenous communities throughout the world which pertains to the land around them**:** knowledge about the movement and characters of animals and plants as well as their medicinal, technological and culinary uses. This may include knowing how to make a paddle from yellow cedar (Pojar, McKinnon, Card & Foraging 1994) or how to make linen from flax; knowledge of which mushrooms are edible or how to weave cedar cambium into clothes. This also includes knowledge of medicine, canoe travel, tides, weather, and the habits and movement of animals -- in essence, much of how we understand and interact with the environment around us. TEK is group knowledge: the knowledge of a community is not held by one person, but by many or all people. It is knowledge which has been developed since time immemorial, because "discerning the subtle connections, similarities, and behavioral traits linking animals, plants, and humans demands careful observation over centuries" (Harrison, 2007, p. 25). Indigenous land stewardship is an important part of TEK which has often been brushed aside by Western ecologists, but which now is widely known as an effective land management system requiring knowledge and dedication (Mulrennan & Bussières, 2020; Waller & Reo, 2018). Declining intergenerational transmission has struck TEK much in the same way it has struck world languages (Hunn, 1993, p. 14). There are large implications from this: intergenerational transmission affects cultural practices as well as languages. One can learn TEK

through language, and vice versa: TEK is carried in language in many ways, from lexical domains to understanding the worldview expressed in the language. This knowledge can be retained by learning both at the same time. Even without becoming an expert, learning about TEK is important and can create a sense of community and pride in the culture.

Language is how culture is shared, continued, preserved. Culture shapes how we interact with the world around us and how we view the land: whether we view it as a static other or as an extension of ourselves. Reclaiming a language is not complete until it reclaims all facets of the human condition, including speakers' knowledge of nature around them. Interactions between language users and the land are undeniable. As we learn in Taylor (2004), "the voice of the land is in our language" (p. 19). From the basic fact that one exists on and with the Earth, to the more complex, purposeful interactions (such as growing or gathering food and medicine), people cannot remove ourselves from the land around us.

The research proposed here is intended to see how these interactions may be used to support language revitalization: how people already are using this connection, and how people may lean in to this connection. This project includes the creation of a resource for using TEK to further language revitalization.

1.5 Self-Location

Self-location provides a way to situate myself in relation to existing research and the research I am conducting here. It is important to recognize that I am an outside settler because colonial languages, in particular English, are most often the reason for Indigenous language attrition (or, per Skutnabb-Kangas (2009), linguistic genocide), and therefore the reason language revitalization is required in the first place. Additionally, I seek to perform qualitative research, which is interpretive research, and "neither data nor theories are discovered. Rather, we

are part of the world we study and the data we collect" (Charmaz, 2006, p. 10). A person's worldview is shaped by where we are born, who raises us, what schools we go to, where we live, and more. Where one comes from affects what one knows and what views of the world one has. However, regardless of where I am or with whom, there are certain facts which remain constant. I am a settler of European descent raised on Nipmuc and Wampanoag land, outside of Boston, Massachusetts. My mother was a high school biology teacher, and my father was a community college professor of marine biology. They raised me to be curious and respectful of nature; a frequent refrain on our hikes was, "look for termites!" for my mother's labs. Nature has always been a large part of my life, particularly since I began working seasonally in the White Mountain National Forest in New Hampshire. I learned much more about the land I am living on. During my time in undergraduate studies at the University of Massachusetts Amherst, I also became interested in languages and linguistics, studying French, Russian, and German, and receiving a Bachelor of Arts in Linguistics and German. Linguistics connected the separate points of "language" and "people". At work I learned the value of nature, and in school I learned the value of languages. Like a tree, a language is surprising, and studying only leads to more studying. Languages, too, have roots and branches and lives of their own. They are worth studying for their beauty and for their richness, and for what they add to the world just by being.

1.6 Overview of the thesis

The purpose of this thesis is to understand the interaction between Traditional Ecological Knowledge (TEK) and Indigenous language revitalization (ILR) and reclamation through interviews with Indigenous experts and a literature review, ending with the creation of a resource. This thesis is built around themes which were developed from interviews with experts to explain how TEK and ILR are inseparably intertwined in several ways. These connections are

including TEK in language lessons; reclaiming language by connecting TEK to identity and Indigenous ways of knowing and being; learning conceptual understandings behind words and grammar; and, finally, how learning TEK and language can help us understand the deep connection to and relationality with the land. This general introduction will be followed by a literature review, methodology, teachings from the experts, a review of community ILR websites, limitations and scope, references, and appendices. The literature review will provide background research organised by relevant themes; the methodology will present and explain the framework of Grounded Theory which was used in this thesis. The interview results will present the experts who were interviewed as well as their insights. The website review provides a look at TEK and ILR through the lens of communities involved in ILR. This chapter is organised by the themes which were developed through analysis of the interviews as described in the methodology; the insights which were shared and from which the themes were developed form the backbone of this thesis. The interview chapter is followed by a web review which analyses community ILR websites. Finally, limitations and scope will propose areas for further study. This research found that TEK and ILR are intertwined in terms of method and content of lessons, the intersection of cultural identity and language reclamation, learning about the conceptual understandings and worldview behind words, and understanding the land through language.

2. Literature Review

When based in community movements, it quickly becomes clear that language revitalization and TEK are inseparably connected (Melzer, 2014; Hermes, Bang, & Marin, 2012; Hermes, Engman, & McKenzie, 2021). A person is not unidimensional, and neither is their language. A language is more than linguistic theory, and linguistics as a field reflects that: with the emergence of the fields of language documentation (Himmelman, 1998) and revitalization (McIvor, 2020), new connections with related fields and studies are being developed.

Many of the challenges which Indigenous languages face today, such as the effects of colonialism and challenges with intergenerational transmission, are also faced by those cultures which they hold, and the transmission of TEK becomes similarly threatened. The literature on these challenges is detailed across many studies, most focusing directly on language and cultural heritage, fewer specifically on TEK. In McCarter, Gavin, Baereleo, & Love (2014), a literature review on IEK (Indigenous Ecological Knowledge) is presented, along with a discussion of the challenges and opportunities of IEK transmission. Several approaches to the preservation of IEK are investigated through case studies, from the creation of local databases to national formal education programs. One approach includes the study of peoples' connections to the land. The inclusion of the land around us is inescapable when conducting language revitalization and reclamation work. This literature review provides a broad overview of existing literature, covering of TEK and ILR in the method and content of lessons, the intersection of cultural identity and language reclamation, learning about the conceptual understandings and worldview behind words, and understanding the land through language.

This literature review will provide insight into the ways in which language revitalization and TEK are connected. One way is the direct exchange between TEK and language learning, such as language camps or language-focused nature walks. We can see that people are using their knowledge of and connection to the land to support and inform their language reclamation and revitalization work in many ways (Meltzer, 2014; Boney, Caña, Crawler, Fitzgerald, & Ross, 2015). The second way TEK and ILR are connected includes topics from the documentation of the lexicon or grammar to the recording of cultural context and worldview (Holton, 2018; Odango, 2016). The third is the way in which learning language and TEK may aid language reclamation movements. Because language and culture are inseparably intertwined, TEK is included in any attempt to revitalise the culture or learn the language, from building vocabulary to providing a deeper understanding of grammar (Hunn, 1993; Kimmerer, 2011). Finally, learning TEK and language provides a way to better understand the land (Kimmerer, 2011, 2018; Ferguson & Weaselboy, 2020)

2.1 Learning TEK through Language: Content and Methods of Language Lessons

How are people connecting TEK to their language revitalization efforts? TEK is connected in many ways to language revitalization and reclamation. Indeed, Indigenous pedagogy comes from the land (Daniels, 2021; Kimmerer, 2018; Cajete, 1994). We see this in different places and situations all over the world: from Isubu in Cameroon to Myaamia and Cherokee in the United States. In local, community efforts, the specific culture and environment may determine the ways in which the language and ecological knowledge interact. For example, Cherokee educators began projects with their class documenting the Cherokee language and the speakers' ecological knowledge. The results provide a summary of the process, including an explanation of the technology used; this study also used a community-based method of data

collection, as a class of language students record, edit and create meta-documentation (documentation of the process of learning and performing language documentation)(Boney, Caña, Crawler, Fitzgerald, & Ross, 2015). In another study, using food to aid language revitalisation combines ethnoecology and the Myaamia reclamation process (Melzer, 2014). The work is focused on using this knowledge to reclaim traditional culture, using largely 17th-century records. In Nyinden (2019), an ethnobotanical and linguistic documentation project used to help preserve knowledge of Isubu, a language in the southwest of Cameroon, focuses on local plant taxonomy structures as a way of investigating local history and worldview. TEK can be taught not only to involve students in traditional culture, but to further their scientific education. TEK is

> scientific, in the sense that it is empirical, experimental, and systematic. It differs in two important respects from Western science, however: traditional ecological knowledge is highly localised and it is social (Battiste and Henderson, 2000, p. 44 as cited in Heikkilä and Fondahl, 2010, p. 108).

TEK is science which has been tested over millennia, and which is based in long-term observations. The inclusion of more TEK instruction in Science, Technology, Engineering and Math (STEM) instruction in mainstream schools has also been argued for (Castonguay, 2010; Isaac, 2010). TEK can be used to help teach the language, just as the reverse is also true.

There are deep-rooted issues with reconciling Indigenous senses of place with the dominant Western education system. Indigenous practice shows us that the land literally teaches us; Kimmerer reminds us that traditional knowledge, formed by interaction and familiarity with nature, is a result of study: "Traditional plant knowledge is the product of this orientation to humility, to careful attention to being a student of plants" (Kimmerer, 2018, p. 28). In Western education, there is often little place for this relation with the land. To provide language and TEK

instruction in an Indigenous way is decolonizing; as Cajete (2018) tells us, "the revitalization of Indigenous knowledge through a truly self-determined education provides the most direct route for Native sovereignty" (p. 19). Purposeful interaction with the land can be used to teach the language; interaction with the language teaches about the land by learning vocabulary as well as cultural worldviews.

The use of TEK to teach language encourages students' connection to their history and language. For example, the use of place-based learning as a way of teaching Indigenous students has been proposed for the purpose of relaying local ecological and cultural knowledge (Cajete, 1994). Teaching TEK is part of a holistic approach to language learning, providing the context of land and culture with rich instruction. Learning TEK teaches science, language, life skills, art, and more; hands-on experience is extremely valuable in the classroom as "children learn by doing and experiencing" (Cajete, 2018, p. 24). Land-based learning provides the context of culture and the land from which the language emerged; it literally grounds the instruction. Additionally, it connects students and instructors to "involve community, Elders, traditional ecological knowledge, teachings and ceremony" (Linklater-Wong, 2018, p. 27). The inclusion of TEK in the classroom connects instruction inherently to culture, history, and language.

2.2 Land and Language Reclamation

Leonard (2012) defines language reclamation as "a larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives" (p. 359). Language revitalization, meanwhile, deals specifically with addressing the effects of language shift in endangered language communities and by increasing the usage of a language in more and more domains. Additionally, language reclamation "calls for an ecological approach to language work, one that recognises how language is never independent

from the environment in which its speakers (and potential future speakers) live" (Leonard, 2017, p. 19). The connection between land and language is of central importance in Indigenous language reclamation. The land is present in different ways in language reclamation. For example, in the Gwich'in-speaking community, the relationship between people and TEK not only serves to record much of the traditional knowledge of the Gwich'in people, but also to discuss its significance in the culture (Andre, 2006). In Scots Gaelic, information of how people interact with the land is (as in many languages) represented in the toponymy (Chiblow & Meighan, 2021). There are many ways in which reclaiming language can mean learning more about TEK and the land.

One way to learn more about TEK and the land is stories. Story fits in with TEK and language as a mode of transmission of both at the same time. Additionally, using story to pass on TEK, moral guidance, and language is a central mode of instruction. Stories are rich with TEK and associated morals – though they can be told to children, they contain important messages which pertain to adults, as well. Kimmerer (2018) reminds us that "Traditional Ecological Knowledge is rich with teaching stories" (Kimmerer, 2018, p. 32). Using stories for language instruction is an established practice (Galla & Goodwill, 2017); it is "what Stó:lō scholar Jo-ann Archibald calls storywork: experiential narratives that constitute epistemic, theoretical, pedagogical, and methodological lenses through which we can both study and practice language reclamation" (McCarthy et al 2018, p. 65). Stories can be many things; they can "direct, inspire and affirm ancient code of ethics" (Simpson, 2014, p. 9). Finally, TEK and story are inseparably entwined, and "story and science have always been interconnected and to separate the two would detach one from the true meaning of science" (Isaac, 2010, p. 8). Science and story are both ways of making sense of the world; both are a way of learning about land and learning about

culture; both offer ways of learning how to treat the land, how to respect it, how to take care of others. Teaching with story is a way of incorporating Indigenous epistemology; and

> Story, then, is a means to give voice to the marginalised and assists in creating outcomes from research that are in line with the needs of the community. Reliable representation engenders relevancy and is a necessary aspect of giving back to community (Kovach, 2009, p. 100).

Reclaiming Indigenous ways of being and instructing means including hands-on instruction, connecting to land, and decolonizing instruction. Teaching language through Indigenous pedagogy means teaching with the land, as language comes from the land (Cajete, 1994; Chiblow, & Meighan, 2022; Nicholson, 2013; Simpson, 2014; tisholas, 2022; Armstrong, 2009, 2016). In Parker (2012), the view that land and language are inseparable is looked at, as well as how this relation is changing with online learning. One of the recurring themes of the research in this thesis is the necessity of maintaining connection to the land in order to support the language. As Armstrong (2018) asserts, story is part of a "social paradigm" which "can be seen as constructed from the deep ecological knowledge of the human responsibility that must reside in each generation and must move continuously forward through language, practice, and oral story" (p. 97). Learning TEK provides a connection to history, culture, and community; the reclamation of language involves learning the world view, which is heavily intertwined with TEK (as TEK is how people interact with nature and the land around them), as "they derive from the same conceptual source or understructure ... that was developed over thousands of years in the same landscape" (Nicholson, 2013, p. 493). This involves passing on knowledge about how to act, how to create, how to harvest and care for the land, and the protocols involved (Gonella, Baldwin, & Greenberg, 2015). Language carries culture and so with reclaiming a language

comes reclaiming all facets. We see the direct inclusion of TEK in lesson plans can support the reclamation of language and culture.

2.3 Concepts and Worldview Behind the Words

This theme is about learning not just vocabulary when learning an Indigenous language, but also the concepts and worldview that lends words some of their meaning. In learning vocabulary, one learns much more than a word, including culture, including TEK, including the connections within the language that express TEK. For example, lexical stems show us how worldview appears in the language in Nicholson (2013):

> Reflected throughout the Kwak'wala language *and* traditional Kwakwaka'wakw cultural forms such as architecture, social structure, ceremonies and narrative is the primary metaphoric concept Body=House=Land/World. This empathetic analogous relationship is influential in the formal linguistic manifestation of the u-[a'w-] stem, the spatial division of Kwak'wala pronouns and certain required aspects of the determiner system, in particular, the radial categorization of the stem *ga-* (p. 493, emphasis added).

Kwakwaka'wakw worldview is embodied and shared in the Kwak'wala language in central and foundational ways. Understanding the language means beginning to understand a Kwakwaka'wakw worldview, reconnecting with Kwak'wala ways of knowing and being. Language carries and communicates worldview as well as supporting concepts and understandings.

One area in which this connection is very clear is place names. We also hear that "toponymy contributes to the continuity of oral tradition: place name referents, meanings, attendant narratives and memories are relayed when people know and use toponyms" (Heikkilä

& Fondahl, 2010, p. 117). In Chiblow & Meighan (2021), we learn how people interact with the land is represented in the toponymy in Scottish Gaelic. Toponymy not only informs us of names, but also of how a person may look at the land, and what they see: how one categorises the land, how one navigates it. Place names connect speakers to the language of their ancestors and their history in a very literal way: toponymy preserves language through diachronic changes and can maintain older words or sounds **(**Thom, 2005). To record a place name is to record history of how people have interacted with a specific place; "they depict deep connection with land and demonstrate how people become attentive to the inner workings of nature and place" (Nash, 2011, p. 120). To learn toponymy is to learn history and sense of place; "place names make theoretical notions concrete; they offer us tacit meaning." (Kovach, 2009, p. 62). To learn the history or origin of a place name is telling a story about the land, and

> "we can look out across our landscape, seeing a series of place names, remembering the stories associated with creating and recreating our culture; I would argue that this storied landscape is the equivalent of a library" (Johnson, 2010, p. 833).

Place names can communicate history, a description of place, and connection to the land (Basso, 1996; Claxton, E., p.c. June 29, 2023). One example is LAU,WELN̲EW̲, Place of Refuge, a sacred mountain for the SENĆOŦEN speakers as it saved them from the great flood. The important depths of these names clearly show how a word can convey complicated concepts.

In the field of documentation, it is also important to recognize the importance of the concepts behind words. All facets of human life are captured by our languages, and, if we are to produce comprehensive documentation, the facets must therefore be documented (Si, 2011; Odango, 2016; Holton, 2018). For these reasons, including TEK in documentation is vital. Linguistic documentation may provide information on local species, plant or animal taxonomies,

and even diachronic change in local ecologies, with the introduction of non-native and invasive species (Jernigan, 2012). Indeed, it has been argued that neglecting this reciprocity between ecology and linguistics can be detrimental to studies in which ethnobotany is the main focus, and that linguistics can be a useful tool for those wishing to learn more about both people and plants (Arka & La Hisa, 2017). Although the field of language documentation ostensibly was recognized as its own subfield in linguistics with the publication of Himmelman (1998), as early as Sutton (1980) it was recognized that using botanists' knowledge in linguistic documentation is helpful, and vice versa. In one instance, both fields were used to track the interaction of the Iquito speaking community in Peru with outsiders through introduced plant species and introduced loan words (Jernigan, 2012). For the Isubu language in Cameroon, the documentation of plant names and taxonomy lead to the documentation of medicinal, food, and technological uses of the same plants (Nyindem, 2019). Linguistic diversity and biodiversity show correlation (Nettle & Romaine, 2000), and neglecting this interrelation of two subjects is neglecting an important facet of both, as

> one major drawback of some ethnobiological studies is that the data are presented in the academic literature in a form that is, for all practical purposes, inaccessible to the community. Such studies not only inadvertently deny their consultants the ability to access their own traditional knowledge, but also implicitly value "content" over "form"— that is to say, the biological information— over the language that encodes that information (Si, 2011, p. 171).

Additionally, as Holton (2012) shows, there are many interdisciplinary uses of language archives which have become a source of cultural documentation and carry information related to many other fields of knowledge:

> academics are not the only users, and linguistic information is not the only type of documentation sought… [An archive] user sought information on ethnobotany in the Yukon Flats region not because she was interested in indigenous plant names but rather because she was interested in how plants were used (Holton, 2012, p. 106).

It is important that documentation addresses the cultural context in which a language exists (Leonard, 2018). Linguistics may focus specifically on grammatical puzzles or produce works which do little to serve the community (Leonard, 2017). As Galla and Goodwill (2017) assert, "knowledge, histories, stories, and cultural practices are not limited to what has been documented, but rather in the living languages that are spoken today by our people" (p. 73). For recording knowledge and learning about domains of knowledge, the acts are important, but the goal and end result of a rich, vital language is an important objective. Learning a language means learning these worldviews; weaving TEK along with language learning can support learning the concepts behind the words, as well.

2.4 Understanding Land through TEK and Language

The importance of continuing TEK practices of stewardship and sustainability in a modern world is clear, as are ways we can recognize the importance of TEK for sustaining environmental science today (Kimmerer 2011, 2018; Ortiz, 2018). The idea that humans are stewards of our planet is fundamental in TEK. As Robin Wall Kimmerer (2011, p. 382) explains,

> The gifts of the earth are to be shared, but gifts are not limitless. The generosity of the earth is not an invitation to take it all. Every bowl has a bottom. When it's empty, it's empty. And there is but one spoon, the same size for everyone.

> How do we refill the empty bowl? Is gratitude alone enough? Berries teach us otherwise… Something beyond gratitude is asked of us. The berries trust that we will uphold our end of the bargain and disperse their seeds to new places to grow…. They remind us that all flourishing is mutual. We need the berries and the berries need us. Their gifts multiply by our care for them, and dwindle from our neglect. We are bound in a covenant of reciprocity, a pact of mutual responsibility to sustain those who sustain us. And so the empty bowl is filled.

Stewardship is linked to the concept of reciprocity, or the idea that we as humans, being part of the land, must give back to it and thank the land for their gifts from which we derive our existence (Kimmerer, 2011, 2018; Ferguson & Weaselboy, 2020). This provides protocols for how people are to act; language carries this worldview and culture.

Culture and worldview may certainly be carried in a language: for example, the Kwakwaka'wakw' language carries the cultural connection between the human body, houses, and the land in affixes and vocabulary (Nicholson, 2013). This interconnection is a fundamental part of how nature is viewed and how it is treated. As we hear from Ferguson and Weaselboy (2020), "land must be experienced through Indigenous language in order to fully appreciate those layers of meaning and appreciate the nuances of what sustainable relations are within that Indigenous culture" (p. 3). Stewardship, or reciprocity, is caring for the land in return. Language which comes from the land is also a way of interacting with the land in return. TEK, which by its nature comes from and embodies interaction with the land, thus is directly encouraged through learning the language, as it "takes on a specific role in this stewardship, as it is one key medium or conduit by which a (human) being may also connect with Land." (Ferguson & Weaselboy, 2020, p. 2). Learning TEK can mean learning to understand the land as well as the language.

Landscape terminology and toponymy in a language's lexicon reflect the way speakers live on and with the land. Terminology can include cultural attitudes toward interacting with the land such as navigation practices; toponymy is the study of place names and, importantly, the study of how place names come to be. Landscape terminology includes navigational words and ways of describing the local terrain. Different methods of describing the land "[highlight] the significant role played by navigation and function within the landscape domain" (Grenoble, McMahon & Petrussen, 2019, p. 20). In other words, an analysis of the lexicon can provide insights into the speakers' relationship with the land. For example, in Kalaallisut, a language spoken in Greenland, navigation changes by season, and that is reflected in the large, descriptive lexicon of speakers in place names as well as in the nature of descriptive landscape terms (how are particular features perceived? From which vantagepoint?). The descriptive lexicon shows the "underlying concept that determines in large part what is labelled and how it is indexed" (Grenoble, McMahon & Petrussen, p. 35). In other words, words offer a window into worldview and how the landscape is perceived; what is important about a landscape and worth noting and recording in the language. Additionally, "the reverse is also true: the conceptualization of the environment encoded in the Kalaallisut landscape lexicon is a major factor in navigation and in the associated domains of spatial orientation" (Grenoble, McMahon & Petrussen, 2019, p. 29). Words we use to name and describe the land show how we live with it and conceptualise it; while showing us the underlying concepts of description, they also help shape them. Understanding the language means learning about the land and how it is perceived.

2.5 Literature Review Conclusion

Traditional Ecological Knowledge is the knowledge of a peoples' interaction with the local environment, whether that is food, medicine, or technology. It is passed by generational

instruction and carried by each specific culture. As we see, TEK is "knowledge of the natural environment – of the species it contains and how it functions, as well as [knowledge holders'] understandings of their own place within it" (Hunn, 1993, p.13). TEK is science, and it is spiritual (Cajete, 2018).

This literature review works to outline the intersection of nature (including such wide-ranging topics as toponymy and ethnoecology) and language revitalization. Language revitalization itself is a broad topic: from documentation to producing sustainable and effective language education, there are many moving parts which may present the opportunity for this symbiosis. However, there are still areas for exploration – possibly in the extant literature itself. There are fewer papers relating to the use of TEK in language revitalization *specifically*, such as its use in curricula and lesson plans. Documentation of TEK and language go hand in hand, as does Indigenous language revitalization and TEK: TEK must be included in any documentation, both for the quality of the documentation and recording of TEK; it is a large part of any cultural revitalization effort which may accompany the revitalization and reclamation of its language. This inseparable connection is intertwined with decolonizing and Indigenous sovereignty, as well as community health (Ferguson & Weaselboy, 2020, p. 2). This literature has done much to illustrate the breadth and importance of TEK in ILR. We have seen, however, questions arise from the literature that will be answered in the interviews or by the website survey.

Below in the Methods chapter, we begin to see how the methods of conducting this research have shaped this work.

3. Methodology

The purpose of this project is to investigate how communities use TEK to further language revitalization efforts through a literature review and interviews with Indigenous experts and to ultimately produce a usable resource for language practitioners that is informed by this research. This methodology section explains how this project has been done in several steps: first, by undertaking a review of the literature; second, by conducting interviews; third, by conducting a website review of community ILR websites; and finally, by creating a usable resource. All three parts of this project utilise qualitative research methodology (specifically Grounded Theory method of analysis (as per Charmaz, 2003)) and all three parts seek to answer one or more of the following questions:

1. How do people include TEK in their language revitalization work?

2. What are some of the effects of including TEK in Indigenous language revitalization work?

3. What about TEK is important to language revitalization?

Analysis followed the qualitative data analysis method of constructivist grounded method. Constructivist grounded theory, a method of qualitative data analysis, provides a meeting point between Indigenous and Western methodologies as it allows the data to speak for itself without being decontextualizing. It allows us to find themes in the data to produce a theory which answers our research questions. With the final goal of providing consistent analysis and a final theory to answer the research questions, constructivist grounded theory uses intense reading and systematic annotation of data (here, the interview transcripts). Using these methods requires thorough analysis, annotation (called coding), inter- and intra-coder reliability.

More details on data collection methods are provided below: first is a presentation of guiding Indigenist methodologies, then a look at how the literature review was constructed. Next will be an overview of how the interviews with experts was approached and, finally, how the website review was constructed.

3.1 Indigenist Methodology

It is vital for this research to embrace an Indigenist Methodology and centre Indigenous experience. An Indigenist methodology means working within an Indigenous paradigm and using compatible methods to conduct research (Kovach, 2009). To use the blanket term "Indigenous paradigm" comes with the acknowledgement that Indigenous cultures are varied and by no means monolithic. However, there are central tenants which are shared to the extent that it is possible to find a foundation for an Indigenous research paradigm. To talk about a research paradigm, first we must introduce an Indigenous epistemology, which provides the foundation for the research paradigm. Epistemology is the study or theory of knowledge: how knowledge is created, how it is expressed, and how it is passed on. Indigenous epistemology "includes a subjectively based process for knowledge development and a reliance on Elders and individuals who have or are developing this insight" (Hart, 2010, p. 8) and one of the most important things for it is "the understanding of the reciprocity of life and accountability to one another" (Hart, 2010, p. 9). Indigenous ways of knowing (i.e., Indigenous epistemology) are experiential and

> "[emphasise] the importance of respect, reciprocity, relation, protocol, holistic knowing, relevancy, story, interpretative meaning, and the experiential nested in place and kinship systems – all of which ought to be in a research process that encompasses this way of knowing" (Kovach, 2009, p. 67).

Indigenous epistemology is multifaceted and focuses on interconnections between the researcher and their subject. This relationality is "wholly integrated" (Kovach, 2009, p. 57) within all facets of the research; to understand an Indigenous epistemology (and from there, an Indigenous research paradigm) is to understand a "relational web" (Kovach, 2009, p. 57). To bring this back to understanding an Indigenous research paradigm, we can see how this epistemology or "philosophy behind our search for knowledge" (Wilson, 2007, p. 194) forms a path for us to follow, and "it is then the choice to follow this paradigm, philosophy, or worldview that makes research Indigenist" (Wilson, 2007, p. 194). It was important to do this research in a good way and to follow Indigenist principles, and to follow these tenets while doing the research in order to keep myself accountable. This was important so that this work is not extractive or exploitative. Some of the guiding principles were found in Wilson (2007, p. 195):

•Respect for all forms of life as being related and interconnected.

• Conduct all actions and interactions in a spirit of kindness and honesty; compassion.

• The reason for doing the research must be one that brings benefits to the Indigenous community.

• The foundation of the research question must lie within the reality of the Indigenous experience.

• Any theories developed or proposed must be grounded in an Indigenous epistemology and supported by the Elders and the community that live out this particular epistemology.

• The methods used will be process-oriented, and the researcher will be recognized and cognizant of his or her role as one part of the group in

process.

• It will be recognized that transformation within every living entity participating in the research will be one of the outcomes of every project.

• It will be recognized that the researcher must assume a certain responsibility for the transformations and outcomes of the research project(s) which he or she brings into a community.

• It is advisable that a researcher work as part of a team of Indigenous scholars/thinkers and with the guidance of Elder(s) or knowledge-keepers.

• It is recognized that the integrity of any Indigenous people or community could never be undermined by Indigenous research because such research is grounded in that integrity.

• It is recognized that the languages and cultures of Indigenous peoples are living processes and that research and the discovery of knowledge is an ongoing function for the thinkers and scholars of every Indigenous group

The guidelines include compassionate and responsible approaches which are relevant and beneficial. It is important to ask, how have these tenants been followed in this research? These tenets keep the work grounded in relevant methods. They are important to this thesis because this research focuses on Indigenous knowledge. To learn about the important things discussed in this thesis without following an Indigenist paradigm would be hypocritical; while talking about how to respect and include TEK and Indigenous knowledge I should be able to commit to those

values in my own research. These guidelines have been followed by adhering to Indigenist research methods and attempting to maintain a relevant and reciprocal approach. Following the guide of Kirkness and Barnhart's (1991) "Four R's" supports "the belief that [relevance], respect, responsibility, and reciprocity fundamentally results in research directed towards the support of the collective rather than for individual advancement" (Brayboy et. Al, 2012, as cited in Hall, 2021, p. 47) and provides guiding principles by which to orient this project. Especially following Gardner's (2012) *The four Rs of leadership in Indigenous language revitalization,* I follow the four R's in my work in these ways:

- Respect – To show respect for knowledge of experts as well as for the generations which have passed on and enriched TEK;
- Responsibility – To support language revitalization and pass on the knowledge which was shared with me to others;
- Reciprocity – To return the knowledge that was shared with me in some way;
- Relevance – To fill a need.

An additional concept by which to situate this research is what Willie Ermine, a noted Cree scholar, speaks of as an "ethical space" between cultures: in this case, Indigenous and Western cultures. The ethical space refers to a metaphysical space that,

> "entertains the notion of a meeting place, or initial thinking about a neutral zone between entities or cultures. The space offers a venue to step out of our allegiances, to detach from the cages of our mental worlds and assume a position where human-to-human dialogue can occur. The ethical space offers itself as the

> theatre for cross-cultural conversation in pursuit of ethically engaging diversity and disperses claims to the human order" (Ermine, 2007, p. 202).

While doing this research, it has been important to me to find an intersection between Indigenous and Western cultures and to sit in this space where dialogue can happen. Following these points and sustaining these principles serves to make a model for how to approach this research. Now that we have an idea of what an Indigenous epistemology and research paradigm is, or at least some of the key parts, we can begin to look at how the methodology for this project fits in. To perform Indigenist research means to centre lived experiences and to use a methodology which is compatible with an Indigenist paradigm. In order to do this, following Parker (2012), I chose to structure my research and analysis using Grounded Theory as explained in Charmaz (2003). Grounded Theory is a method of qualitative data analysis. It meshes with an Indigenous paradigm as it provides a framework by which to consider and fully rely on the words of experts in interviews. In Grounded Theory, while it is recognized that our experiences shape our realities and how we perceive things, it also requires and ensures unconscious presuppositions and biases are not brought into the work, and that the ensuing theories are based purely on the data (here meaning a literature review and interview transcripts). More information on the mechanics of Grounded Theory is provided in section 3.3. Following an Indigenist paradigm and centering the words and experiences of Indigenous people is meant to contribute to decolonization and to contribute to lifting the voices of Indigenous people and privileging their knowledge.

3.2 Literature Review Methodology

To accomplish the goals detailed in the introduction, it was necessary to conduct both a primary and secondary literature review to ascertain how TEK is already being used in

communities and learning environments, such as schools, language camps, and immersion programs. The first literature review provided basic background, and also began the formation of themes and theories for qualitative data analysis. These themes are further expanded on in the interview section. Since the literature review alone exists as an incomplete base of knowledge without the interviews, "the balance arises between reliance on the literature to provide the framework to start with … and having a level of understanding to provide an orientation" (Bryant & Charmaz, 2007, p. 23).

This first part of this project is a continuation of the literature review first presented in the proposal, which grounds this work in extant research on how TEK is used in documentation, revitalization, language lessons, and other language work. This final literature review includes the collection of both papers from academic literature which is included to determine the perceived impact of TEK in the fields of linguistics and Indigenous Language Revitalization.

3.2.1 Literature Review Design

The final or secondary literature review contains analysis of extant literature using the constructivist grounded theory method of qualitative research (explained in more detail below). The organisation of the literature review is guided by the readings themselves, following Charmaz (2003, 2006), as "we *construct* our grounded theories through our past and present involvements and interactions with people, perspectives, and research practices" (Charmaz, 2006, p. 10). Each article provides its own ideas and themes which serve "to establish an initial basic understanding" (Parker, 2012, p. 16). The literature review here serves to help begin synthesising themes: the literature is treated *as data itself* and has been analysed as such. However, this process was not complete until both the website survey and interviews were

analysed, completing the process of theory building that began with the initial literature review. Because we cannot declare analysis done until all data (here referring to the wisdom and insight gained from the experts as well as information from the primary literature review and web survey) is analysed, we could not declare the analysis of the literature review to be complete beforehand. The final theories and themes were developed during analysis of the interviews, and were applied retroactively to the literature reviews, following Parker (2012, p.16). The literature review was formulated to maintain a "canopy perspective" per Grimes (2009, p. 9), which provides a wider perspective than a narrow or more focused collection of literature. While the literature fits the themes provided by the interviews, it is from a diverse, global background (unlike the website review, which collected data from websites for specific languages). This mixed design provides, hopefully, a thorough and complete background with which to contextualise the interviews: a global perspective for wider context, as well as specific background for the interviews.

3.2.2 Literature Review Data collection methods

For this research, the sources from the literature review themselves are used as the data; following Charmaz (2006, p. xii), "I refer to the materials we work with as 'data' rather than materials or accounts because qualitative research has a place in scientific inquiry in its own right." That is, the collected literature was viewed as data. Academic sources were compiled through use of the internet search engine Google Scholar and the UVic McPherson Library collections search tool. The website survey was also compiled through the use of the internet search engine Google and was restricted to websites in the language spoken by the experts who were interviewed and analysed using the tool developed by Parker (2012) (see Appendix E), with my own necessary alterations to make it relevant to this study (see section 3.3.2 for more in-

depth explanations). The survey used a collection of webpages, online class resources, class listings, and other material which is open to the public. It is an important part of the literature review and provides a look at community language revitalization efforts with their own words, perspectives and materials.

Because I am not involved in any language revitalization movements, I am unable to provide personal insight and information on the pertinent relationship between TEK and language revitalization. However, the ability to investigate academic writing as well as current community applications is valuable and has, along with interviews with those involved, hopefully begun to make up for this absence of personal experience. The literature review provides an important foundation of knowledge upon which to build.

3.2.3 Literature Review Analysis

Using the primary literature review to recognize patterns in the data and help prepare for the interviews, the literature provided a starting point with which to form initial impressions. The final goal is to create a theory about the interaction of TEK with Indigenous language revitalization through comparative data analysis, moving "back and forth between data and increasingly abstract analysis" (Bryant & Charmaz, 2007, p. 23). The intended analysis has already been mentioned obliquely: following initial coding and memos, as required by Grounded Theory, comes creating themes and categories. The initial literature review provided suitable background to understand the subject matter and begin theme formation; the secondary literature review further followed the development of themes from the interviews and provided necessary context for this thesis. Further inspection of these themes as they relate to each other and the

interviews is important, as "grounded theory leads us back to the world for a further look and deeper reflection – again and again" (Charmaz, 2006, p. 149).

3.3 Interview Methodology

After writing the literature review, the next step was to interview experts who have been involved in the work of incorporating TEK in language revitalization. These interviews were of immense importance, providing invaluable wisdom and experience and forming the backbone of this thesis. The interviews also contextualised the literature review in lived experience and provided valuable guidance for the final resource. Following Parker (2012), I will be referring to the people interviewed as experts, as

> "in using this term, I acknowledge that they are more than mere participants in this research, but have in fact shaped the very core of it. They have acted as my teachers, whether or not they hold the official title of teacher in their daily life. Moreover, the term expert recognizes their extensive knowledge and experience on the subjects of language and land, and the fact that they are … experts in their communities." (Parker 2012, p. 17).

Centering the years of lived experience of these experts ensures that this work will have its basis in the lived experience of those involved with language revitalization, as well as guidance from interviews based on decades of learning and living and will not be an academic abstraction.

The first step (the literature review) is to create a picture of what is being done by establishing an understanding of current practices. Subsequently, the next step (the interviews) is to give this picture dimension and depth and enrich this understanding. How do language

learners or teachers use Traditional Ecological Knowledge to connect with or learn their language? What challenges do they face? How do they overcome these challenges? The experts interviewed to help answer these questions are community members who are directly involved with language reclamation and were from different language communities to **"**emphasise gathering diverse but overlapping data on a limited number of cases or situations" (Tri Council Policy Statement, p. 135). (Introductions to each individual expert are provided in Chapter 4.)

Interviewing those who are involved in the work themselves provides much deeper insight than reviewing the literature and the internet. The experts have experiences which do not show up either in academic literature or on community websites. One cannot interact with a website; a website is not a person and therefore does not possess the same depth and breadth of knowledge. Talking to experts who have been involved with both TEK and language revitalization for many years ensures that an Indigenous experience is respected and emphasised. Using the analysis of these interviews to guide the rest of this thesis helps ensure this perspective is not only found in the interview section but is also reflected in all other sections. These interviews were done in accordance with guidelines of University of Victoria Human Research and Ethics Board for Human Participant Research, as discussed below, and form a central part of this thesis.

3.3.1 Interview Design

The questions for the interview were developed in a couple stages. First, I asked the question, what am I trying to answer? I was trying to answer the research questions: How do people include TEK in their language revitalization work; what are some of the effects of including TEK in Indigenous language revitalization work; and what about TEK is important to

language revitalization? Next, what was the best way to go about answering those questions? By conducting interviews, the voices and experiences of Indigenous people doing this work could be privileged and I could gain a better understanding of their experiences and knowledge. When writing the interview questions, it was intended that using open-ended questions would give more room for the experts to discuss what is important to them. More specifically, these questions could introduce the experts in their own words; questions about what is important to them about TEK, about ILR; questions about how they overcome challenges; questions about connections between language and nature. These questions were informed by the literature review and developed with inspiration from examples of Parker (2012), with the goal of answering the original research questions.

The first three questions were an introduction of the expert, to better understand them and their work:

1. Can you tell me a bit about your story, and how you got into this work?

2. What form does your language work within the community take? Does this work involve Traditional Ecological Knowledge, and if so, how? How do you define TEK?

3. Where are you in your language journey (fluent, native speaker, second language learner, etc.?

The following questions, 4-11, were designed to learn more about their experiences and perspectives on the connections of TEK in ILR:

4. Why is it important to you to work with TEK, in general or within your language work?

5. How do you think nature can help in your language revitalization and reclamation work?

6. Do you think knowledge of TEK affects how you or others learn your language? If so, how?

7. How do you use Traditional Ecological Knowledge when learning or speaking your language?

8. Do you think it is important that language learners engage in or learn TEK? Why or why not?

9. What challenges do you or other learners find with using TEK in language classes? How do you work to overcome these challenges?

10. Do you have a favourite lesson involving TEK and/or your language that you would like to share?

11. Some languages show a connection with nature in their lexicon; for example, in ʔayʔaǰuθəm, ǰɛʔǰɛ means both “tree” and “cousin”. Do you know if there are any words or phrases in your language that also show the connection with nature and other concepts like this? If so, can you share them with me.

Finally, because the production of a resource guide was an important part of this thesis, I wanted to invite recommendations for what would be useful to produce

12: One of the goals of this project is to create a useful resource that will help return some of the knowledge I have found in this research to communities. I’d like this

resource to be useful, and your input as an expert in your field is very valuable. If such a resource would help support and benefit your work, what would you recommend be included?

The questions were designed with an open format, so that the experts may emphasise what is most important to them, rather than being guided (however unintentionally) by my preconceived notions of importance, which may not align with theirs. The guiding interests which begot the research questions serve as "*points of departure* to form interview questions, to look at data, to listen to interviewees, and to think analytically about the data" (Charmaz, 2006, p. 17, original emphasis). Asking close-ended questions or using prompts which direct the expert in too much of a specific direction would provide less space for the experts to share their knowledge. It would also diminish the actual purpose of these interviews, which was to learn from the experts about their own experiences as they wished to express them.

Because the data are so rich, and need to be read and analysed so closely, between three and five interviews were proposed as a feasible number for completion. The actual number was four interviews, with five experts interviewed (one interview was with two experts at the same time). This number was enough to provide multiple accounts and perspectives, as well as multiple languages and approaches to their work, while also remaining feasible given the time constraints.

3.3.2 Interview Data collection methods

The interviews were conducted after ethics approval. It was not possible to build relationships with the experts before contacting them due to the time constraints of the project. Therefore, interviewees were contacted by my supervisor with an approved recruitment script to

ask if they would be interested in being interviewed, as she knew the experts before contacting them. After agreeing to be interviewed, the expert was offered the exact interview questions and consent form. This process gave them the opportunity to bring up any potential issues and so that there would be no surprises during the interview. The questions were open-ended, providing the experts with room to explore topics as wished or needed. The interviews were conducted in person, when possible, or over Zoom, and recorded in their entirety. When in person, all UVic COVID protocols were followed or exceeded (such as testing before meeting, providing tests if requested, and regular hand washing). Recording devices included Zoom audio and transcript record, digital audio recording devices loaned through the University of Victoria McPherson library, and, once, my smartphone's voice recording app, when the batteries to one of the loaned devices died. Field notes were taken throughout the interview for simultaneous data collection and analysis, to record first impressions and begin reflecting on what was being said. A hand-made gift was given to each expert to thank them for their time and for sharing their knowledge and experiences.

Transcription for the first three interviews used the Zoom Otter.ai-generated automatic closed captioning. Remaining time and transcripts were transcribed after double-checking the AI transcription. Transcription of each interview took between four and six hours after final checks were complete. When the expert spoke in their own language, some background research was required to be able to present each language precisely, accurately and in its full richness. This included searching all available sources such as dictionaries, word lists and phrase lists. Experts were consulted on occasions when I was unable to determine specific words.

The duration of interviews ranged from 45 minutes with single participants to an hour and a half for interviews involving two participants. Afterwards, the digital recordings and

transcriptions were sent to the expert, and comments, questions or concerns were invited. Following analysis of the transcripts, the excerpts to be used in the thesis were also sent to each expert, with my analysis and my interpretations of the interview. This ensured accuracy – not just in the actual transcriptions, but also in my interpretations – and allowed the experts final say in what knowledge they are willing to impart and how they wished to be represented.

Managing timing was an important lesson; being on top of matters and able to respond quickly, clearly and concisely was important for everyone involved. While time is required to produce thoughtful and well-written work and develop a good relationship, promptness helps maintain streamlined and clear communication. Reflecting on your words and making sure you are communicating clearly is also an important lesson. Time is a valuable resource; spending time with experts before the actual interview provided time to meet them and learn from them – I greatly value those meetings, which helped us feel more comfortable with each other. These meetings were also enjoyable: the experts are fascinating people with so much to learn from. Listening to them brought great joy and reflection.

I sought guidance from each expert as to how best to approach community engagement and information as they know best how to contact their own community:

> "Community engagement is important to ensure that the following considerations are reviewed: the potential impact of such research on the wider community; conflicts between the individualist norms of the academic environment and the norms of the community; and the possibility of unclear or mistaken assumptions on the part of participant and researcher. *During the consent process, researchers should give the participant the opportunity to identify the relevant form of community engagement, and*

at what stage such engagement should occur" (Government of Canada, Tri-Council Policy Statement, 2019, article 9.8, my own emphasis).

Experts were asked about how best to ensure proper community engagement as each expert comes from a different community and knows best how to approach their individual situation. In this matter, it is important to be prompt, clear and concise. In this way, I hoped to show respect for the communities of each participant while also respecting their own authority and insight in this matter.

3.3.3 Interview Analysis: Grounded Theory and Qualitative Data Analysis

The interviews are not contained whole and verbatim in the finished thesis but are organised by the development of themes and categories and supported with the relevant sections from the transcript. As previously mentioned, the interviews were recorded, transcribed, and finally analysed under a grounded theory framework, largely informed by Charmaz (2006) and supplemented with Charmaz (2003) and Charmaz (2014), with Saldana (2013) providing coding guidance. Grounded theory, which provides an emergent model for data analysis and theme development, begins with coding, moves on to memo writing, and finally produces a mid-level theory that answers the researcher's questions. Grounded theory is a type of ethnographic methodology, which is a way of investigating "the social and cultural construction of identities, persons, and groups" (Rampton, Maybin, & Roberts, 2015, p. 20), and has a goal of giving "voice to people in their own local context" (Fetterman, 2019, p. 1). The practice of ethnography began with Franz Boas' studies and was subsequently adopted by the field of anthropology and, later, by sociolinguists. This methodology is important, as "meaning takes shape within specific social relations, interactional histories and institutional regimes, produced and construed by

agents with expectations and repertoires that have to be grasped ethnographically" (Rampton, Maybin & Roberts, 2015, p. 18). Grounded theory is a particular manner of investigation with the end goal of providing insight through rigorous, structured analysis.

One of the first steps of Grounded theory is coding. Coding is a repetitious process, wherein

> you revisit all aspects of the data you have collected, including those you may not have noticed during the actual data collection. This will likely trigger analytical ideas that are not simply derived from your (unconsciously) selective impressions and recollections of the data collection activities (interviews, observations etc.) (Linneberg & Korsgaard, 2019, p. 7).

Coding consists of annotating (in this case) each sentence or conceptual chunk with a word that summarises its content or meaning, and "typically involves selecting, interpreting, and summarising" (Huang 2019, p. 6). The summarising word can be taken directly from the data (here the interview transcripts) or can be more abstract and an interpretation. The original goal for coding was to use Parker's (2012) interpretation of constructivist grounded theory from Charmaz (2003) for coding, and instead of going line-by-line, using "conceptual chunks" (Parker 2012, p. 48) in order to maintain a more holistic approach. However, this approach proved to be overwhelming due to the richness of the chunks. To compromise, I analysed interview transcripts first sentence-by-sentence, and then as part of the coding process returned to the data and analysed conceptual chunks. While the coding process of line-by-line "gives you leads to pursue" (Parker, 2012, p. 53), it is ultimately decontextualizing. Saldana (2013) lists many ways in which one may approach coding; as is recommended, I used several approaches and looked at

many different facets of the data when coding, which Saldana (2013) names “pragmatic eclecticism” (Saldana, 2013, p. 60). These approaches included what Saldana (2013, p. 64) terms In Vivo (using words or phrases found in the data as codes) and holistic coding (where data is looked at as a whole).

After several rounds of annotating using the program NVivo, codes are grouped together into coherent themes: “a category is formed by grouping together those codes related to one another or that belong together because of their content within the specific context” (Huang 2019, p. 6). This second cycle of coding is meant to seek out and determine underlying themes and categories. The categories’ descriptions help highlight the underlying themes, which “embody the latent content” (Graneheim & Lundman 2004 as cited by Huang, 2019, p. 6), as the categories themselves “represent a descriptive level of the manifest content of the text” (Graneheim & Lundman 2004 as cited by Huang, 2019, p. 6). Using the qualitative data analysis platform NVivo, these categories and themes can be organised as the researcher wishes and “in an order that is central to the research query” (Huang, 2019, p. 14). Guiding categories for this analysis were already developed in the primary literature review, including TEK in language documentation, TEK in language reclamation, and language and land. These themes were arrived at by preliminary analysis on the first literature review; they were further developed during analysis of the interviews. The themes that emerged through data analysis form the backbone of this thesis.

Inter-coder reliability is an important part of qualitative data analysis; it ensures the results of the coding process are not created without thought and consistency. For this project, ensuring inter-coder reliability meant asking a colleague to code 1/3 of the interviews themselves in addition to my coding, and then comparing our codes using NVivo (methods borrowed from

Huang, 2019). Any discrepancies or differences in opinion were discussed until both parties agreed with the coding. Once a resolution was found, inter-coder reliability was established. Additionally, *intra*-coder reliability was found; this included setting aside my own codes for six weeks before returning to see if my codes were still consistent. These methods of ensuring consistent and trust-worthy coding practices make certain that the results found in careful analysis of the data are produced by rigorous and systematic methodology which produces results not solely based on my own opinions or impressions of the data; these trustworthiness measures "enhanced the dependability of results" (Blackstone, 2019, p. 54). The categories and themes derived from the interview analysis were retroactively applied to the literature review (as well as the website survey). The background research contained in the literature review informs but does not overshadow the new information contained in the interviews, which allows the reader to learn more fully about how language revitalization and TEK interact. The interviews are thus an integral part of this study.

3.4 Website Survey

Websites included in the survey are restricted by geographical region and language family in order to provide a sharper focus on one region; the selection of websites corresponds to the languages spoken by the experts (being nēhiyawēwin (Plains Cree), ʔayʔaǰuθəm, Kwak'wala, and SENĆOŦEN). The survey was conducted in order to provide edifying and clarifying context before and after conducting the interviews and the review of the academic literature. Including a web review provided a way to look at community based ILR through the lens of those communities. Different facets of these websites were subject to investigation, such as media content, audio files, links to other websites or resources, word lists, and common themes. Guiding questions included: is there a difference between what is prescribed as acceptable

interactions between the fields of language revitalization and nature and what is actually being done in communities? How are communities organising their lessons? Are there similarities in how this is done between language communities? Is TEK present in all lessons, some, or few? Is it the focus of a lesson or merely supplemental? What themes are present in instruction? Is it part of a summer camp or immersion school, or continuing education for adults? This section will hopefully answer these questions and provide a clear enough guide for those who wish to use it to further their own goals of using TEK in language revitalization. The websites were investigated using the tool for website surveys developed in Parker (2012, p. 162-164) and altered for the topic here (see Appendix E for my own version). The questionnaire was applied before and during the interview analysis in order to provide additional background information and was considered completed only after the interviews were finished. This approach is similar to that of the literature review, although the website review is included in order to provide another lens to look at how TEK is used by communities in language revitalization. Collecting these primary sources on the day-to-day use of TEK in language lessons requires thoroughness, and their inclusion in this thesis is equally as important as published scholarly works.

3.5 Resource Creation Methodology

The Four Rs provide a framework for how to do research in a good way, by honouring Indigenist methods and ensuring that the ensuing work is useful rather than extractive. By following the Four R's and incorporating Indigenist methodology, I seek to "centre this research within an Indigenous paradigm while using a methodology compatible with Indigenous ways of knowing and learning" (Parker, 2012, p. 10). Additionally, "the community must be involved in conducting the research, with the additional purpose of building capacity within the community." (First Nations Information Governance Center, 2014, p. 36, henceforth FNIGC). As I draw from

other peoples' knowledge from the literature review and interviews, the resource hopefully returns much of that knowledge to share with others, prioritising and addressing a need (which was communicated during the interviews).

The presentation of this resource comes with two caveats: the first, that I do not intend myself to be presented as an expert telling people the best way to do this, but rather presenting the steps others have used for incorporating TEK in their own language revitalization. Secondly, that TEK is passed down from person to person; while this type of instruction may not be studied here, it is just as important as instruction in schools or classes.

3.5.1 Resource Design

This resource guide (Traditional Ecological Knowledge in Indigenous Language Revitalization Resource) (see Appendix A) was created in order to provide an introduction to TEK in ILR which is parallel to the thesis and guided by the experts' suggestions, and which follows the same themes developed in the thesis on how people are including TEK in their language revitalization practices. The resource contains condensed sections following the same themes explored in the thesis and developed using grounded theory, with the same headings for each section as Chapter 4: Teachings from the Experts. Additionally, it provides an additional list of online resources for each section and theme, as well as a list of activities which instructors could use to support TEK in their language lessons. It is packaged and presented in a more accessible way than the thesis. For example, Chicago Manual of Style (CMOS) Notes-Bibliography system citation is used as it provides necessary citations without interrupting the flow of material. Despite these differences, this resource provides an exploration of the same themes as those in the thesis, if not to the same depth as is possible within a larger work. Using a

shorter size, more attractive formatting, and more accessible language means this resource is able (and meant) to be distributed. By following the examples of First Peoples' Cultural Council (FPCC) resources found in their online Resource Library, as well as the nêhiyawak Language Experience Camp Guide 2022: How to Start a Language Experience Camp: *tânisi ka-êsi mâcipitamihk pîkiskwêwin waniskâpicikêwin*, I hoped to follow examples of thoughtful, useful, and well-planned guides.

Supporting quotes from the interviews were used to illustrate the concepts using the experts' words directly, as well as quotes from other sources where I felt they would sustain the themes and provide supporting evidence. This section was guided by the knowledge imparted by the experts during the interviews. Question 12 in the interview (see Appendix A) asks experts what they would want in a resource for including TEK in language revitalization. Experts noted the importance of online resources, which are easier to access and more popular with younger generations, as well as resources which are easily distributable and provide information in a straight-forward, attractive way. The experts were also invited to give feedback on the completed guide in order to engage in co-creation of knowledge; however, due to financial and time constraints it was not possible to fully engage in co-production of this resource. Ideally, this resource would have had more input and guidance from the experts, in addition to a longer timeline. Time was spent reflecting on how best to align with the thesis, as well as on how best to present and show the experts' words, which quotes to include, and where outside sources were useful. The information contained in this resource is intended to be used by instructors of Traditional Ecological Knowledge (TEK) and Indigenous Language Revitalization (ILR) in the context of their revitalization work, or by non-Indigenous instructors who would like to learn more about how to include TEK in a respectful way in their classes. This resource can support

this work with the presentation of knowledge imparted by Indigenous experts during interviews, the analysis of which can be found in the accompanying thesis. It ends with possible activities for learning or teaching TEK and language in tandem. The information in this resource comes from those who are already working for the betterment of their communities.

The background knowledge required to create this resource was collected from analysis of the rest of the project. In the literature review, the data are the sources themselves; that is, the papers, books, journals, and websites. The survey of language revitalization websites is limited to the geographical region and language of the interviewees; it is a collection of webpages, online class resources, class listings, and other material which is open to the public. The wisdom imparted by experts in interviews is essential to this resource. Both the literature review and interviews inform and provide the framework for the creation of this resource, which is an important outcome of this research.

3.6 Ethical Considerations

The ethical considerations for this project are important in ensuring this work is done in a good way and all involved are treated respectfully and their work, wisdom, and experience is honoured. Because this project includes interviews, it underwent a UVic Human Research Ethics (HRE) review. There are many different facets to consider when preparing for an interview, especially when discussing language reclamation, with which many people hold a deeply personal connection. The HREB process helps address many of these: the interview process describes such things as preparing the questions to be within minimal risk (including how they will adhere to COVID-19 guidelines); recruitment; informed consent; compensation; possibility of anonymity; and use and storage of data. If this project is ever to be used as a resource, it must

be accessible in several different ways. Perhaps most importantly, it must be easily available to those who can use it. This includes sending the final copy to the experts interviewed. That this thesis will be accessible largely through the institution of the University of Victoria is unavoidable; however, this also means it will be publicly available, free, and downloadable.

When engaging in this research, it is important to acknowledge that this work is dependent on the previous labour of many people, without whom this work would be impossible. Additionally, following the Four R's (Respect, Reciprocity, Relevance, and Responsibility) (Kirkness & Barnhart, 1991; Gardner, 2012) is an excellent way to make sure this work is being done well. Respect for traditional knowledge, the knowledge holders, and all the people who have made this research possible; to keep this project relevant to language revitalization efforts and thereby useable; to ensure this sharing of knowledge is reciprocal, and to give back to those in whose knowledge I'm sharing, as well as to make sure that I'm not just presenting myself as a one-way teaching instrument; to accept the responsibility of my own position to do my best with this work to make it useable and useful to others.

Finally, it is important to understand the responsibility that comes with interacting with the field of language revitalization, which generally has a high standard for respect of persons and research partners. It was important to maintain a thoughtful and kind approach when preparing interview questions and was equally important when writing the analysis, by being critical of each question and of my own assumptions. It urges us to think deeply and predict how we may unintentionally work against our goals and better natures by perpetuating harmful practices, as "when scholars fail to be reflexive about their own positionalities and disciplinary structures, which contain racism, sexism, colonialism, and other –isms, injustices are easily perpetuated – even by those committed to social justice" (Leonard 2020, p. 90). We may wish to

do well and act kindly towards others, but without addressing our own biases (and those inherent to the systems within which we work) and reflecting on how we affect others, we may still find ourselves treating others poorly.

3.7 Methodology Conclusion

The methods detailed above were chosen in effort to produce the richest understanding possible from all available information, including ILR websites, academic literature, and interviews. The website and literature reviews provide an ample base of knowledge with which we begin exploring theories and answering the research questions. Including interviews not only provides deep insight into how TEK and ILR are enmeshed, but also works towards centering Indigenous perspective in this paper. Grounded Theory provides a method to see the interviews from all angles. The final resource ensures reciprocity, and that this thesis is useful to others. All parts of this thesis work together to ensure proper care is taken to produce a thorough, thoughtful whole.

4. Teachings from Experts

4.1 Introduction

This chapter relays the words of experts who were interviewed about their experiences and knowledge about TEK and ILR. The purpose of this section is to centre Indigenous experience and knowledge in this thesis; to provide a more profound look at TEK in ILR, its effects, and its presence; to continue answering research questions. All the coding and categories are formed from these interviews. The interview was formulated using open-ended questions meant to prompt participants but ultimately let the experts impart what they found to be most valuable; it was important for me to do my best not to "[frame] questions in a way that restricts the possible answers, as can occur when categories from one culture are uncritically applied to analyse another" as that "may engender conclusions that are incomplete, if not wrong" (Leonard 2017, p. 20). Listening to what they wished to discuss led to rich conversation.

The analysis uses Grounded Theory, which includes close reading and multiple rounds of annotation and reflection with the end goal of producing themes which answer the research questions (see Chapter 3 for a more detailed discussion on Grounded Theory and the methodological framework of this thesis). Themes were developed after several cycles of analysis. Limitations included my own position as a non-Indigenous researcher, which influences my perspective in this work; particularly with an emergent method of data analysis such as Grounded Theory, the researcher influences or is part of all parts of their research. Therefore, as Parker (2012) states, "the interviews are perhaps best regarded as conversations, or as teaching sessions, in which the experts chose and modified their remarks according to who I was as a learner and interlocutor" (p. 48). During the interviews, the experts shared knowledge and experience acquired over many years. I am grateful to have been able to talk to all of these

experts, for the wisdom they shared and the kindness they displayed. I learned about more than just the questions in the interview and what they shared inspired reflection. In section 4.1.1, I would like to introduce and honour the experts before we begin talking about the interviews as each one has generously shared time, experiences and knowledge of immeasurable value; each is greatly respected in their community and has contributed so much to passing on language and culture. They have done huge amounts of work to support language and culture revitalization in their communities. I also want to honour the languages these experts speak. Lastly, I want to put the lands these languages are spoken on into context, so the reader may understand more about where the language came from, where the people come from, how this knowledge I have been talking about grounds us to where we live and opens our eyes to the world around us.

This chapter is structured around centering what the experts have said. The themes by which this chapter is structured were developed by adhering to interview transcripts to bring as little of my bias to the work as possible, reading closely and repetitively to give their words full consideration. I include "minimal discussion" as "the words of the experts speak eloquently for themselves" (Parker 2012, p. 49). The themes that emerged are discussed in the following sections: Section 4.3.1 introduces learning TEK in language lessons; section 4.3.2 discusses TEK in language documentation and archiving; section 4.3.3 discusses TEK and language reclamation; section 4.3.4 discusses language and understanding the land; section 4.4 presents a short conclusion.

4.1.1 Introduction to Experts, Languages and Lands

The five experts who shared their knowledge are presented below in chronological order of the interviews. These experts are acknowledged as knowledge holders in their communities;

they work in revitalization of language and/or culture. Of the languages they speak, SENĆOŦEN and ʔayʔaǰuθəm were Central Salish languages, Kwak'wala is Wakashan, and nēhiyawēwin Is Algonquian.

The relationship between individual, language, and land is important here. Ideally, it would have been possible to have a deeper relationship with each expert outside of the interviews. Nevertheless, each interaction was meaningful. Additionally, throughout the interview and analysis process, I gained a better appreciation of each language: they are evocative and beautiful in their own unique ways. Lastly, I became familiar with Vancouver Island and surrounding areas and waters: being in the forests and by the water was an important part of my time there. In this way, my own relationships with individuals, languages, and lands grew and changed.

Dr. Belinda kakiyosēw Daniels

Dr. Belinda kakiyosēw Daniels is a member of sâkahikanihk, Sturgeon Lake First Nation, SK, and an assistant professor at the University of Victoria in Indigenous Studies. She speaks Plains Cree (nēhiyawēwin) as a second language and has worked hard for many years to reclaim and revitalise nēhiyawēwin. She is the founder of nēhiyawak Language Experience, a not-for-profit organization that hosts an annual summer immersion camp among other programs since 2004. She shared that she learned to appreciate the land and have gratitude for what land has to offer from her grandparents, who spoke the language with each other (B Daniels, p.c., February 15, 2023).

nēhiyawēwin

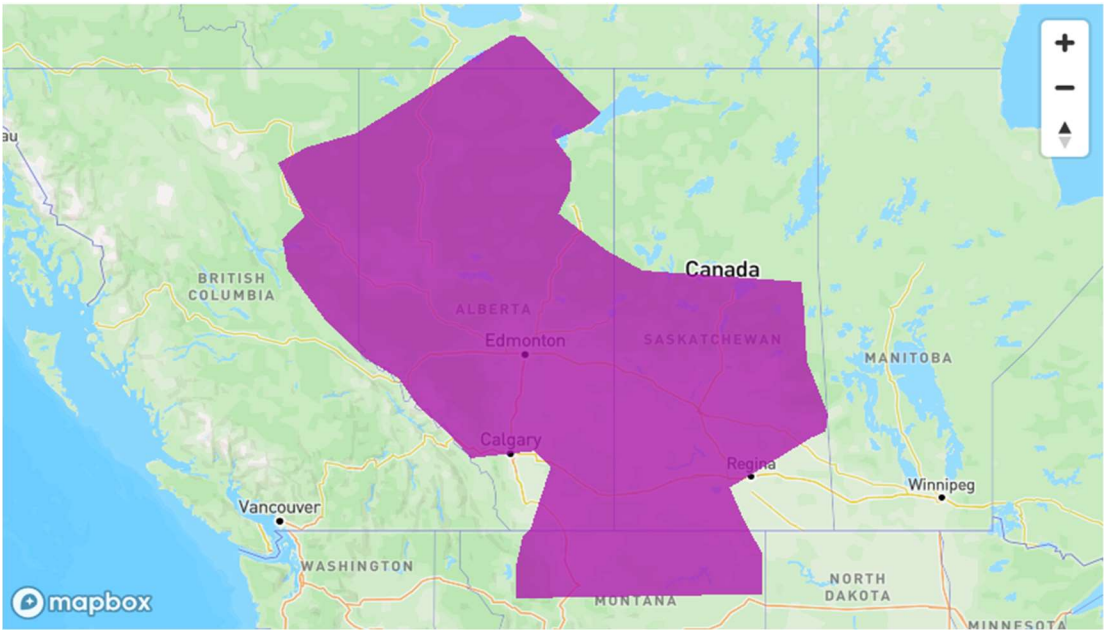
nēhiyawēwin, or Plains Cree, is a dialect of Cree. Cree is an Algonquian language and is one of largest Indigenous languages in Canada by speaker base; the dialect continuum spans

from the East coast to the Canadian Rocky Mountains. nēhiyawēwin is a Western dialect spoken in what is now called Saskatchewan, Alberta, and Montana. It uses an alphabet as well as a syllabary. nēhiyawēwin is polysynthetic, meaning words can contain all the grammatical elements of a full sentence.

Plains

nēhiyawēwin is spoken on the plains of what is known as Saskatchewan, Alberta, British Columbia, and Montana (see Figure 1: Map of nēhiyawēwin). The plains are known for rolling hills and immense skies, where you can watch weather coming in from a long way off. The winters are cold and the summers are hot. It is a beautiful, diverse landscape, including aspen woodlands, prairies, mountains, and boreal forest. Watch as aspens shiver in the breeze and the tamaracks turn golden in the fall; over us all watches the blue, blue sky.

Figure 1: Map of nēhiyawēwin (Native-Land.ca, 2022).



ochele Betty Wilson

ochele Betty Wilson is a fluent speaker of ʔayʔaǰuθəm and an Elder of Tla'amin Nation. She has dedicated many years to teaching and revitalising the ʔayʔaǰuθəm language and currently works to archive and document the ʔayʔaǰuθəm language. She was instrumental in developing a school curriculum for ʔayʔaǰuθəm, beginning with preschool and daycare (Tla'amin Nation, 2020).

Drew Blaney

Drew Blaney is a member of Tla'amin Nation and is the Culture and Heritage Manager there. He is a language guardian and drummer, as well as a singer and songwriter. He is learning ʔayʔaǰuθəm as a second language.

ʔayʔaǰuθəm

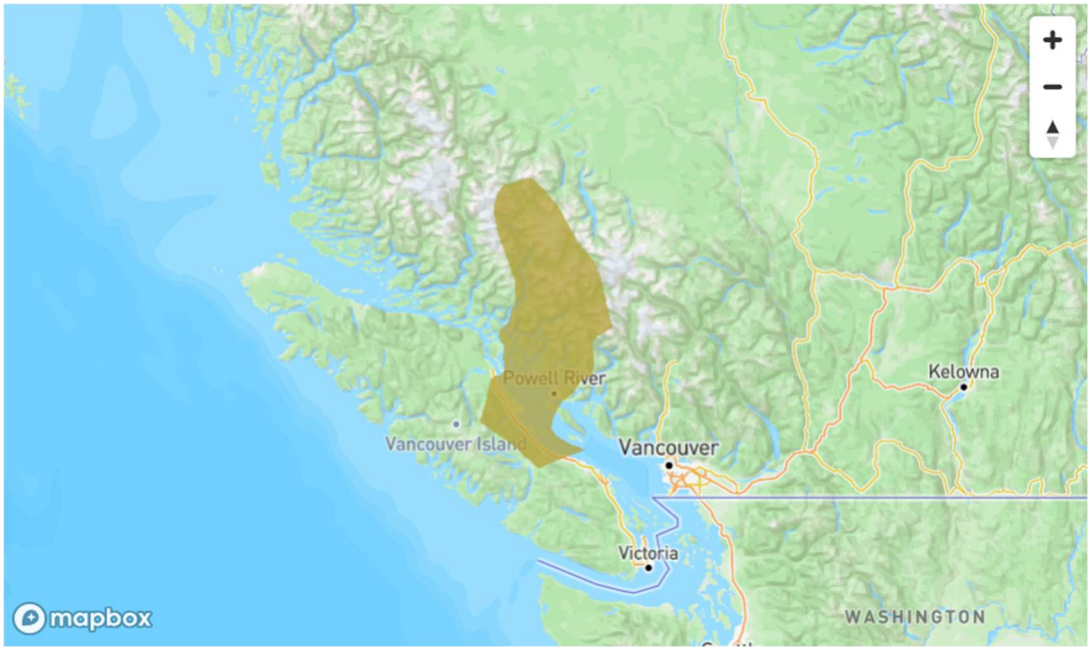
ʔayʔaǰuθəm is a Central Salish language, spoken among Tla'amin, Homalco, Klahoose, and K'ómoks Nations on central Vancouver Island, the adjacent islands and the mainland. ʔayʔaǰuθəm is taught in local schools in addition to a language nest and adult language learner programs (Huismans, 2023).

Southern Vancouver Island, Adjacent Mainland

ʔayʔaǰuθəm is spoken from the central east side of Vancouver Island to the adjacent mainland (see Figure 3: Map of ʔayʔaǰuθəm). This area is also a temperate rainforest with towering Douglas fir and cedar. The mountains catch the rain and clouds from the Pacific. This allows for huge trees and tall ferns, as well as a rich diversity of what are called "epiphytes," or, roughly, "another plant": plants that grow on other plants, such as ferns and mosses. This is also a land of mountains of astonishing grandeur. Like the north of the island, the sea provides mud flats in which to find clams, open water in which to fish, and secluded inlets and rocky beaches

on which to see crabs, sculpins and sea stars. As you walk to the water's edge, hear the clacking of the rocks in the waves, the susurrus of the water, and the cries of a gull flying overhead.

Figure 2: Map of ʔayʔaǰuθəm (Native-Land.ca, 2022)



'u'magalis June Johnson

'u'magalis June Johnson is a member of We Wai Kai nation, Cape Mudge. She speaks Lik̓ʷala, a dialect of the ligʷiłdaxʷ people. She is an Elder in Residence at North Island College. She is a knowledge holder and has worked for many years to teach Lik̓ʷala and Kwak'wala as well as about plants and their uses.

Kwak'wala

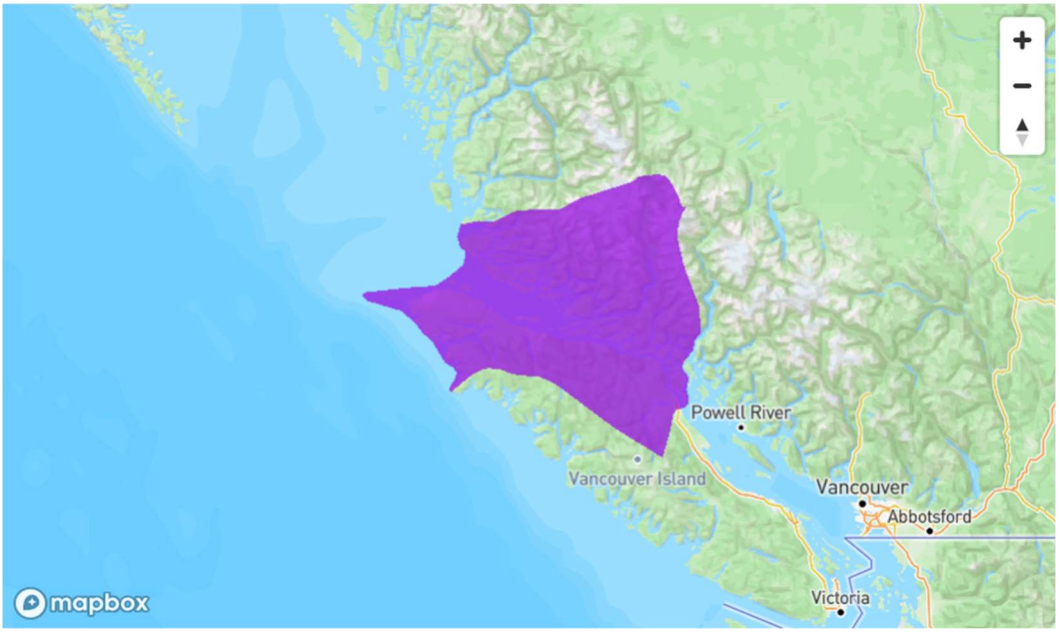
Kwak'wala is a Northern Wakashan language spoken on the north of Vancouver Island and adjacent islands and mainland. It is a polysynthetic language spoken by several First Nations, known collectively as Kwak'wa̱ka̱'wakw (Kwakiutl Band Council, 2018). First

Peoples' Cultural Council lists 531 speakers, and Kwak'wala has been an available subject in schools for several decades (Gessner, Herbert & Parker, 2022).

North of Vancouver Island, adjacent mainland

Kwak'wala is spoken on the north of Vancouver Island and the adjacent islands and mainland (see Figure 3: Map of Kwak'wala). It is a land with both mountains and seas, with cool, wet winters and sunny summers. The forests here are generally cedar, fir, and hemlock, with big leaf maples, cotton woods, and aspens in riparian areas. The oceans are rich and full of life: there are bull kelp forests, eel grass flats, and open water; visiting the beach, one may see otters and sea lions, anemones and chiton. Further out on the water are humpback and orca whales, as well as herring and salmon. The forests are quiet and shaded; the trees tower above you as moss and lichen hang low: touch them; feel how much rain the moss needs to live on the side of a tree like this, and the pure air the lichen breathes.

Figure 3: Map of Kwak'wala (Native-Land.ca, 2019)



Earl Claxton, Jr.

Earl Claxton, Jr. is a respected Elder who also works at PEPAKEN̲ HÁUTW̲, a greenhouse and education centre associated with the W̲SÁNEĆ school board. He is a storyteller and teacher of plants and their uses as well as the history of SENĆOŦEN speaking people. He also teaches his personal message of kindness. He also was a team member in the landmark case Claxton vs Saanichton Marina (1987).

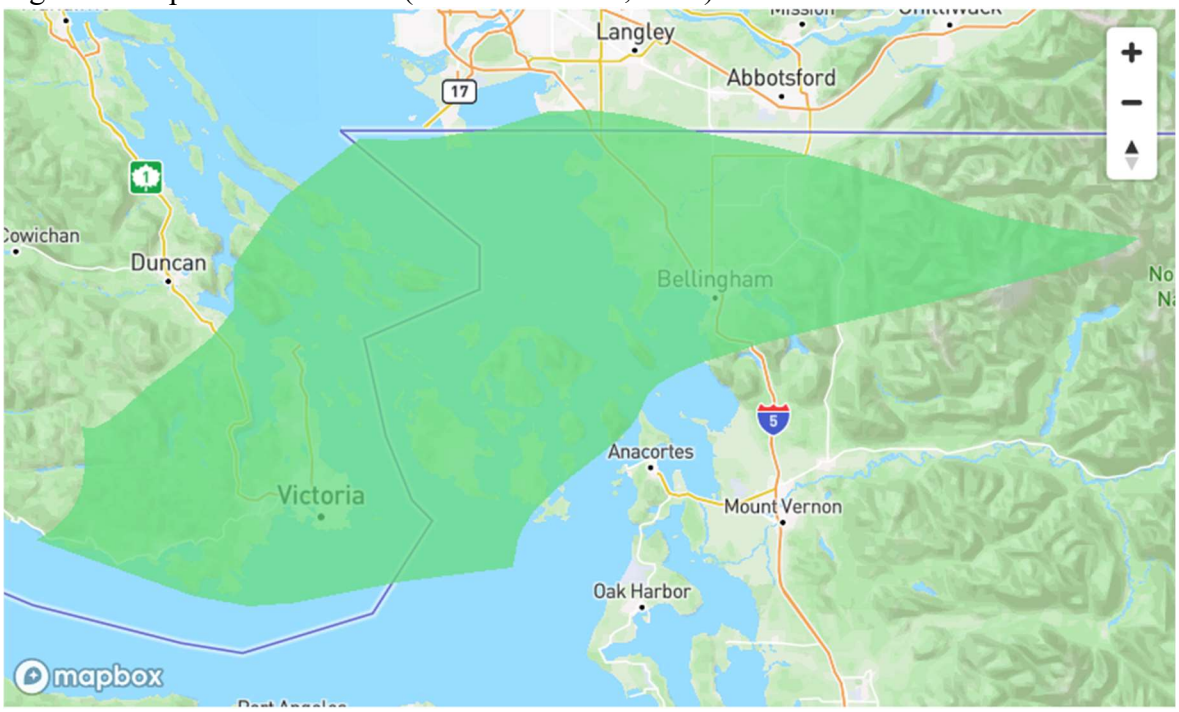
SENĆOŦEN

SENĆOŦEN is a dialect of North Straits, a Coast Salish language spoken on southern Vancouver Island and adjacent islands (Montler, 2023). The written alphabet was developed by Dave Elliot. The W̲SÁNEĆ school board offers immersion classes at ŁÁU, WELN̲EW̲ Tribal School from preschool to grade five as well as adult classes.

Southern tip of Vancouver Island, Gulf Islands and San Juan Islands

SENĆOŦEN is spoken on the Saanich peninsula on the southern end of Vancouver Island and on neighbouring islands. It is one of the mildest regions in Canada, with cool, wet winters and warm, dry summers (see Figure 4: Map of SENĆOŦEN). The forest walks right up to the ocean here. Harbour seals are common in SN̲IDȻEŁ (Tod Inlet); they are curious and friendly with enormous eyes. Jellyfish appear in the water in the summer; some look like fried eggs sitting just below the water. This area is home to Garry Oak meadows, an endangered type of savanna ecosystem. It nurtures twisty Garry Oaks with dark green leaves as well as bright blue camas flowers, historically a substantial food source for the W̲SÁNEĆ people. Sit in the tall grass and watch as the sun sets behind the hills; across the Strait of Juan de Fuca, the white mountain peaks turn red.

Figure 4: Map of SENĆOŦEN (Native-Lands.ca, 2020)



4.2 Teachings from the Experts

In this section, what the experts shared in their interviews is presented. The experts shared some of their experiences and knowledge based on their many years of working to revitalise language and/or culture. Their expertise lies in different areas and they bring different perspectives and histories. However, there were some themes that the interviews shared. This section is organised using the themes developed from the interviews, which are a product of cyclical reflection and coding. These themes are taken from the interviews and directly reflect the content. Below, we begin learning about including TEK in language lessons.

4.2.1 Learning by Doing: Including TEK in language lessons and vice versa

> when you're taking [learners] for walks, they're learning hands-on, what this plant is. That's what I do when I take school groups – start off with the first plant and go all along as we're doing on the walk and explaining what each one of them

> are. Like before the salmon berries come out, we pick the shoots, they're called *sḵ̓wa'ɬa̲m* and then we peel it, and then dip it, that was our candy when I grew up, we dip it in sugar. Sit on the porch and peel our *sḵ̓wa'ɬa̲m*. Salmon berry sprouts. But, like even with the cow parsnip, before it flowered, I'd show them, okay, like it's a hollow stem, and you can cut it and pick it and you peel it and it tastes like celery. So different things as you're, you know, going through the forest, you're learning all that (June Johnson, p.c., June 9, 2023).

Language and TEK are interconnected specifically in a language learning setting, involving both the contents and methods of learning and instruction of TEK and language. This section looks at how language lessons for the purpose of language revitalization can incorporate TEK in many different ways and with many benefits. TEK can be embraced in different ways and is vital to Indigenous languages; as Belinda kakiyosēw Daniels says, "to me TEK is land, and land and language work in unison, because that's where language comes from. It comes from the land. Light came first, and land, and then language came after" (p.c., February 15, 2023). When teaching language through or with TEK, both content and methods are involved.

The content of lessons includes the subjects of the lessons, the material that is learned (including skills, vocabulary, or grammar) and discussed in the lesson or teaching session. The content of language lessons can include TEK in several different ways; one way is by teaching vocabulary within a relevant semantic domain. The term 'semantic domain' refers to specific categories of meaning. For example, activities such as weaving and carving use specialised vocabularies. Learning these skills not only helps revitalise and maintain these skills, but also the words and concepts that accompany these skills in the language. As Drew Blaney explains,

> working with people that know traditional knowledge, you're able to learn new words, I think, that could have been lost...with Betty working on the fish trap project, I didn't know that *wuχo* was our word for fish trap. Right. So, working with different knowledge keepers that…know different things, I think we're able to identify different words that some other people may not know (p.c., April 14, 2023)

Additionally, lessons come from community or family members. As Earl relates, his grandmother taught him about plants' uses, saying,

> my granny… talked about plants and their traditional native uses. Because we, we know about medicines, we talked about her place where we've stayed at the Tod Inlet. That we knew where the plants were, the ones we knew were for medicines, or for teas, or for food, and for medicines. Like the Ocean Spray, or Ironwood...That one had a tool, I think the only one it didn't have was food. I can't think of anything other than using the sticks to prepare, prepare salmon (E. Claxton, personal communication, June 29, 2023).

This quote shows us how intergenerational transmission of TEK can mean learning botany on the land. Learning about specific domains of knowledge helps maintain those concepts and processes, but also the words, phrases, and language that goes along with that domain. Learning vocabulary which relates to specialised subjects is one way of including TEK in language lessons. Drew Blaney highlights the importance of learning about different forms of TEK, saying,

> I think it's important to work with, you know, people that work in different fields, whether it be medicines or carving or, you know, fish traps, fishing, hunting, they might have learned different words...growing up, you know, practising those things with your parents or grandparents and...collectively, then we all come together were like, able to learn from each other. Right. So, I think it's really important that we work with our knowledge keepers (p.c., April 14, 2023)

Being able to learn from each other and share this knowledge collaboratively is part of its significance. The content of these lessons teaches carving and language at the same time, reinforcing the connection between them. The two go hand in hand, and it is a reciprocation which supports both. Learning language while practising and learning TEK is a natural and valuable method. Teaching using Indigenous methodology and learning Indigenous ways of knowing and being is important when learning an Indigenous language, and learning TEK is a way of introducing or elaborating this. As Belinda kakiyosēw Daniels says, "as far as TEK goes...I would just call it *askiy*...land pedagogy, I suppose" (p.c., February 15, 2023). Teaching using traditional hands-on, activity-based methods on the land is a way to align with Indigenous values while teaching language. As June Johnson explains, learning language comes hand in hand with learning TEK; additionally, using a hands-on methods can be especially beneficial:

> Because when you're in the bush, I would say, okay, this is salmonberry, this is k̓a̲mdza̲kw, and I would show the other part is, this is the salmonberry sprouts, sk̓wa'ła̲m, so they're learning the names of the plants as we're doing the walk. I find that doing the nature walk, especially with kids in elementary, and kids in high school students, they're learning a lot through going on hands-on and seeing the plants and what they were used for (p.c., June 9, 2023).

Using visual examples, interaction is a way of centering the relationship between language and the land and using a relevant methodology. Integrating language when learning or performing TEK, and weaving them together, is a central way of learning language. Drew Blaney discusses the way in which this happens, saying,

> we've been working on our totem pole right now and working with, you know, people … [who speaks] a language to us all day, when we're there at the carving shed. So, I think weaving all of it together...he's really skilled in his art of carving, but he's also, you know, a speaker of our language, right? So, weaving the two together when doing our different cultural programs has been truly amazing, because I think it's all tied into each other, right? It's who we are, it's within our DNA to be...practising our cultural practices but also speaking our language. So, I really like the fact that we have people … willing to teach us the language, you know, when carving and doing other things (p.c., April 14, 2023)

Often, TEK is taught using hands-on methods and then, as Betty Wilson reminds us, "language learners engage" (p.c., April 14, 2023). Learners need more than repetitious, rote learning; as Belinda kakiyosēw Daniels shares about learning Cree through drama, "[the teacher] made it feel fun. It wasn't like pressure, it wasn't like, you know trepidation, to speak your language. It was all the exact opposite. And so, I was like, intrigued after that. I was inspired to reclaim my own language" (p.c., February 15, 2023). Using different methodologies engages learners, who can acquire many skills in one. Interactive methods keep them involved in the lesson. TEK can offer ways of participating in lessons while also being on the land and waters. As June Johnson says,

> knowledge of TEK affects how you or others affects how you learn your language is like hands-on, a lot of it, and…visual… about the plants and also like the looking out on the water, cause that's part of us, that was our highway. You see the dolphins, you see the *maχ̲'inuχ̲*, you see the *g̲wɑ̓'yɑ̓m*, you see the big whales as you're going, you know through it. So, you're learning those words as you're looking out and talking to the class or people that are, decide to go on the walks and stuff. So, they learn by visual, and seeing. And that even includes that on the water, or you see salmon jumping, oh there goes a *mɑ̓ɬik*, a sockeye jumping in the water. Just, all the different things you see are pretty visual in the language learning (p.c., June 9, 2023).

At the same time, TEK can be valuable to learn in other subjects. Learning language through TEK is a way to also learn chemistry, physics, botany, zoology, and mathematics. Skills like weaving are also "really an art" (B. Wilson, p.c., April 14, 2023). TEK is a way of interacting with the land and is also a way of inspecting and analysing it. In learning TEK, one is learning many different skills at the same time. For example, Betty Wilson explains how learning about chemical reactions comes naturally from participating in harvesting, saying,

> there's a chemical reaction...once you take the root off the tree, a chemical reaction happens. You have to move quickly, because we've learned to take the outer bark off of the root fairly quickly, split it before it's too dry and hard, and all of those is a chemical reaction. So, our Elders knew that (p.c., April 14, 2023)

Learning the process of taking the bark off a root not only involves learning the mechanical operation, but also about how the root reacts to the air. This is one example of

how one can learn chemistry as part of interacting with land. Integration of TEK in other subjects can have students learn in a new way, as Betty Wilson explains, like learning math through weaving. She explains the tangible way in which learners can, by learning TEK, learn other skill sets:

> I always was so, you know, with math, it was just so painful, and then, oh!... He says, I love the way you use polynomials in your weaving, you know? I went…I don't know what a polynomial is! I open the dictionary and go, oh, okay, so that's a polynomial! You know? Unconsciously using math ... it also needs to be shown to other kids (p.c., April 14, 2023).

Traditional skills require many different parts woven together, and learning other skills goes hand in hand (as we've seen, this includes polynomials in weaving, chemistry and botany in harvesting). Learners can engage with TEK and learn vocabulary and underlying concepts or values. These different facets show the place TEK has in language instruction. The science behind traditional skills is complex and involved; as Betty Wilson elaborates,

> our people, our ancestors, had tremendous mathematical abilities, chemistry, physics, to be able to create these things. We didn't create the massive castles and things that others did, but we used the land, in which our survival, you know; our well-being was just as valid as any of those with their big castles (p.c., April 14, 2023).

The validity and necessity of Indigenous science is important: understanding it is a way of investigating the world, of curiosity, of methodical research which has been performed over

generations. As Betty Wilson relates her experience learning about fish traps, she explains the skills and knowledge that went into building them, saying,

> That was my favourite. That was the funnest project I'd ever done... it made me visualise it, you know, we had engineers. So it wasn't just a group of people throwing rocks and making a clearing. No, it was one or two people there visualising how the structure would look. Because from along the coastline we have fish trap, after fish trap, after fish trap, and they have different designs. One looks like it has its wings outstretched and a beak. And when a fish came in, it confuses them. They don't know how to get out... and thousands of years later, it works. You know, there were fish trapped in there... the best time to see it is when the tide [is] starting to go down, so there's little pools left, it's tiered. That's, that's a mathematical genius (p.c., April 14, 2023).

Understanding the many skills and deep knowledge which accompanies TEK is essential and rewarding. As Betty Wilson mentions, "our Elders had so much knowledge, and they aren't just myths, or what's the other word people like to use? Children's stories. They have, there's validity to them" (p.c., April 14, 2023). One way to interweave TEK and language lessons is by using story. Story can be seen as a vehicle for ecological knowledge, worldview, connection to place, as well as a language learning method. Stories of the land ground speakers in place, in their histories, of how the land and their languages came to be; as Belinda kakiyosēw Daniels discusses,

> there are many stories about land, places. There's stories, origin stories about the trees, there's origin stories about the birds, there's origin, there's creation stories

> about the four directions. Like all of that, I would say, is a part of this TEK" (p.c., February 15, 2023).

Origin stories situate speakers in place. Story is an important method of instruction in language lessons. We can also see stories as a method of interacting with the land as they are used to explain the history of place names, anchoring Indigenous peoples to the land they have lived on for millennia. Instructors teaching with stories can help learners experience narrative forms, new or challenging grammar, and new vocabulary. Story connects directly with place and language.

Including TEK in language lessons is an essential thing which is already being done in many ways; it brings richness to lessons, teaches more than just words, is a good way to connect lessons to include more than grammar; and, finally, is a gateway to learning more about the land around them.

4.2.2 "When we're reclaiming language, land is teacher" (Belinda kakiyosēw Daniels): Language reclamation, TEK, and Identity

> when we're reclaiming language, land is teacher. So, when I say *askiy*, the word *askiy*, you can also find it in the word, *kîskinwahamakewin*, which is to teach. And the word *ski* is in there. So, land as teacher. So that's one example [of] how land and our language are intertwined (Belinda kakiyosēw Daniels, p.c., February 15, 2023).

Language comes from the land. As language reclamation can include utilising Indigenous pedagogy, the land is inherently involved. Belinda kakiyosēw Daniels talked about the development of her nēhiyawēwin Immersion Camp: "I was just writing down ideas of how to

approach this in an organic way, using, I guess, you call it Traditional Ecological Knowledge. I just call it the nēhiyawēwin-ness; Cree ways of knowing and being and doing, all blended into one" (p.c., February 15, 2023).

The connection between land and language is of central importance in Indigenous language reclamation. Place based learning provides context of culture and land from which the language emerged. Learning on the land helps create a safe space to learn. Belinda kakiyosēw Daniels explains how keeping language on the land was a primary concern when she created a language immersion camp, saying, "[language immersion camps are] what I did for a Master's project. I went home to my Cree community, and had Cree speakers speak Cree" (p.c., February 15, 2023).

There are many vital lessons that come from learning on the land, in addition to the language, such as caring for the land and learning how to tend to it. Colonisation has attempted to eradicate these, and using Indigenous methodology is decolonizing, as June Johnson explains, saying,

> the teaching of the language, too...has been a rebellion...we learn by seeing or doing. And, and they tell us 'teach it the colonised way' – I don't. I can see it on paper, but when we have our class, I tell them I'm not teaching it the colonised way, where we have to take notes. If you want to take the notes, like with the language, fine, but ... how I'm going to teach you is almost like on hands and stuff, like with repetition. Yeah, with the language. So we don't, I don't teach it the colonised way because I'm decolonizing it. And Indigenizing the language. (p.c., June 9, 2023)

Decolonizing instruction means including Indigenous ways of being and doing when teaching. Including TEK in western school systems in a responsible, non-extractive way can offer for growth in western education – to raise up and celebrate Indigenous methods alongside western methods, to weave them together, improving reception and awareness of Indigenous science and the validity of TEK, as well as benefiting students by using methodologies which are more hands-on. As Betty explains, it's important for TEK to be included in western education, saying,

> our main curriculum system has to involve Indigenous Knowledge in their teaching. Not as reconciliation, because what's happening is, some teachers make a phone call, "hey can you come and talk to my class," I talk to their class, and he or she feels that they've fit the requirement, that they've done their reconciliation, that's it. No, you know, that's not reconciliation; reconciliation is incorporating our knowledge into the regular curriculum (p.c., April 14, 2023)

June Johnson speaks similarly, explaining,

> it's really good for *everyone* to learn about our plants, and the good uses we have with it, whether you're Native or non-native.... they're learning; and with Truth and Reconciliation, *everyone* is going to learn. Especially about the culture and about the language. And about the peoples and their territories. (p.c., June 9, 2023)

There is a need for broader acceptance and recognition of TEK. There must be a better understanding in western culture of the validity of TEK as well as its connection to culture, and Betty Wilson elaborates, saying,

> "I was talking to the Dean of Education and the first thing I was thinking in my head was, woah, she really doesn't know. She can take the mathematical abstract part, but she doesn't know the cultural background to it. And she freely admitted that. So that's great, you know, she's open to learning and she was very quick to say, can you come to my class, then, and help us, you know. Perfect!" (p.c., April 14, 2023)

The way to include TEK in Western education is to include it with openness to learning. There is a great gap to be filled in order to begin to repair some of the damage of colonisation; inclusive lessons is one way. Learning about TEK means learning about and respecting the expertise that is necessary for TEK. TEK is a way to investigate the world around us.

Learning a language is learning to communicate and connect with others. Being proud of one's language is important, as Betty Wilson discusses, saying,

> "I think there is a great demand of our younger people to learn the language, and they're proud of it -- learning the cultural, traditional skills. You know, I see a lot of young parents out there, being really, being with their kids and teaching them, going back, using traditional knowledge... they're moving it forward. I call it moving forward, you know, because if you remain still -- our language evolves, everything evolves. So, if you stay in one place, you kind of get stuck. But if you take that prior knowledge to help you move on." (p.c., April 14, 2023)

June Johnson speaks to similar things, saying,

> "I really think that it's important that the language learners engage or learn TEK because they're all young people, all young men and women, and those could be

> our future leaders and our future teachers that can teach about the ecological stuff in the forest, in the water. There's so much that they could learn, and they could pass it on for the next seven generations, when most of us will be gone. And I think it's really important for them to learn more about it." (p.c., June 9, 2023)

Language and TEK are living knowledge which require living people to learn, expand, and carry them forward. Learning and engaging with TEK and language both means they can also be passed on. Involving younger generations in learning is important, and as June Johnson says, "the young people find it really interesting, and are really interested in learning about our traditional knowledge and how we always took care of it" (p.c., June 9, 2023). Intergenerational transmission was also mentioned by Belinda kakiyosēw Daniels, saying, "I'm trying to create transmission in the language, from families to children" (p.c., February 15, 2023). The transmission of language and culture to the next generation is a wonderful thing, as Earl Claxton relates, saying, "I was...doing a class here at the gardens, and a little girl in Grade 4, I think at that time, she asked me a question in SENĆOŦEN... So that was really amazing when I heard that" (p.c., June 29, 2023). Learning language impacts the future, and is impacted by the past, as Belinda kakiyosēw Daniels explains her ancestors' influence in her work, saying,

> "once in a while, my ancestors will intersect in the work that I do, and the path that I'm on. So that's super important. This is why tobacco is important, and this is why when I introduce myself in the beginning and Cree, all of those things are important. Especially when I'm talking about the language spirit. And this work that I do, as well -- *I* didn't choose it, it was my ancestors that chose me to help do this work" (p.c., February 15, 2023).

Recognizing and acknowledging those who have come before us helps connect speakers to their ancestors and their histories. Language reclamation means not just enlarging a speaker base, but reclaiming the pride and sense of identity that comes with a language. As Betty Wilson asserts, the validity of TEK is a significant concept, saying,

> I think it would go such a long ways if our larger society didn't … think of our people always in a negative sense. That our people did really strong, positive, traditional cultural values that involve maths and sciences. And it was a more holistic look – because it's part of who you are. So TEK I think is really important for all to recognize (p.c., April 14, 2023).

Respecting the Indigenous people who have developed and passed on this knowledge is important. It is also important to recognize TEK as a facet of culture which involves important lessons and as a way with which to learn about the land and oneself. Earl Claxton, Jr., also speaks to the importance of keeping language alive and how it connects to an Indigenous identity, saying, "if you lose your language, [Dad] said, you become just like them. Was his words. And I guess he meant that we would become like the W̱ENITEM people" (p.c., June 29, 2023). Language is intimately tied to identity and is intrinsically valuable.

Language reclamation is as complex and varied as the people who are learning and speaking the language. In the past several decades, language revitalization and reclamation have been growing, and "the young people want to learn" (Betty Wilson, p.c., April 14, 2023). Learning TEK grounds language in place and culture and "you also find... land is iconic of identity, and certain places and spaces have stories and songs" to go with that land (B. Daniels,

p.c., February 15, 2023). Lastly, TEK and language both provide concrete ways to learn worldview and understand the land.

4.2.3 "It's not just words, but also concepts" (Betty Wilson): Learning worldview through TEK and language

> when I talk about [plant names], when I know the SENĆOŦEN word I'll repeat it so that [learners] learn too. Like the snowberry is, the berries are poisonous, the white berries; and the name of that one is PEPKÍOŦ… And it means 'little revenge berry'. Because we believed in karma. That you did good things, good things would happen to you. And if you did bad things, bad things would happen to you… you'd sneak it into the food of someone that slurred your name or had done something against your family [for revenge] (Earl Claxton, Jr., p.c., June 29, 2023).

Earl Claxton, Jr. explains how one word can have much deeper connections to culture behind it. Learning the name PEPKÍOŦ in this way not only teaches learners about local ethnobotany (the edibility of native plants and how this berry was used) but also connects to deeper lessons such as a moral balance in life. The story behind this name has multiple lessons. These connections are conveyed through language. Betty Wilson reminds us, "it's not just words, but also concepts" (p.c., April 14, 2023). This theme is about learning the worldview and complicated concepts which a language carries, and which TEK can support. June Johnson also speaks to this connection with an example of how the Kwak'wala word for welcome has multiple layers of meaning, explaining,

> When we do lessons, when we first start, we always start off with our introduction. And I always find, you know, when you, *gilakas'la* is welcome, or thank you, and *gila-* means 'come' and *kas'la* is 'with your whole being' – that's actually what it defines as (p.c., June 9, 2023).

Here we see how learning one word not only teaches a greeting or thanks, but also teaches the welcome that this word brings with it: "come with your whole being". When this concept is explained, it is hard to find a single word for a literal translation in English. This exhibits several things: that one word may have nuance beyond a literal translation into English, and that this nuance may bring insight into how the world is viewed by speakers.

The importance of keeping linguistic material clearly contextualised and explained in documenting or archiving is discussed by Betty Wilson when talking about the work she does with her language, ʔayʔaǰuθəm:

> With the Traditional Ecological Knowledge, it goes hand in hand with language archiving. We have a huge momentum in the four communities here in Tla'amin, … It's just that people I know [are] able to concentrate just on archiving, because it's gotten very technical with the grammatical structure. Okay, if you use an iota here, this is what that word means. Like, just 'to run'. But if I change the iota to an *i*, gee, it means, actually, 'running' (p.c., April 14, 2023).

Language archiving safe-keeps language data, such as recordings or writings, for future access. Choosing what to archive is a decision which requires thoughtful deliberation. Users may also benefit from archives for reasons which are not mainly language-related: searching for botanical or geographical knowledge retained in archives is a demonstration of the multi-faceted

nature of archives. It is important to avoid "the trap of merely translating western scientific knowledge into the target language, with the result that native concepts are incorrectly glossed, and native, possibly alien, ways of thinking are seen through the lens of a more familiar ontology" (Si, 2011, p. 182). The concepts behind the word offer much more context than just a direct translation may provide. Transcription (of audio or audio/visual recordings) is an area where precise word or grammatical differences may require additional elaboration or technical explanations. Context from knowing much of language and worldview is often more complicated than can be communicated in one word. This cultural context is displayed in the intricacies of language. There is understanding the mechanics of TEK, and there is understanding the concepts behind it. For example, in calling the cedar the 'tree of life', its indispensability is acknowledged. Here, the mechanics include using the timber and bark of the cedar; on the other hand, the concepts include the name 'tree of life'. June Johnson also relays the significance of the cedar tree, saying,

> with the *wilkw*, cedar tree, they always said it's the tree of life because it clothed us with the cedar bark; we made canoes with it; big houses; paddles; regalia... we've always called it the tree of life (p.c., June 9, 2023).

Betty Wilson explains how some concepts behind words are complex, saying:

> *ǰɛǰɛ* can be a tree, or it can be your relative. *q̓at̓əm*, which is your liver, *q̓at̓əm* can mean heavy, or it could mean your liver. *ʔɛmɛn* could be the road, or it could be a door. Okay. So those are just very quick examples of how we use words (p.c., April 14, 2023).

Drew Blaney finds similar connections in ʔayʔaǰuθəm, saying, “they talk about big house teachings and how the smoke from the fire in the middle of the floor ... it goes up through the smoke hole in the roof, they refer to it as... a bellybutton, because it’s your connection to your ancestors, feeding your soul” (p.c., April 14, 2023). In these examples, we can see how important nuances can be when documenting and learning vocabulary. This is also an example of how one word with multiple meanings can also reveal values of community, as *ǰɛǰɛ* can mean both relative and tree. This word provides insight into a worldview which values the land in addition to valuing caring and tending for the land.

These concepts of responsibility and community and this knowledge of how the language can convey these concepts connect learners to community, to knowledge holders; it keeps knowledge alive and supported. As Drew Blaney explains this knowledge is collective and is known by a community of experts:

> So, using our knowledge, or our fluent speakers to document is huge. I guess that's, you know, using Traditional Ecological Knowledge. I mean, of the living language that was passed down to them from their parents, their grandparents and, you know, through thousands of years, I think that's, you know, what we're trying to document, if we don't document it... it's not going to survive, because we're down to that really crucial stage of learning. So, I think we have a huge role in, in trying to use our knowledge keepers to document it (p.c., April 14, 2023)

Drew Blaney explains the sense of responsibility and urgency for documentation as well as an ancestral connection to language. While recording and archiving is important to the process of

language revitalization, it is also important to acknowledge that language that is spoken is vital and alive in a different, unreplicable way.

To look at place names is to look at history, of the land and of the people who live there. Earl Claxton, Jr., illustrates important qualities of place names as he explains the meaning of SȽIDǴEŁ, saying,

> knowledge of place names is very important and shows our length of time that we've lived here. We have a special name for each of the places, and each of the words have significant meaning of why it's called that…SȽIDǴEŁ, Place of the Blue Grouse, was our first village site, and that, it was called that because there were so many blue grouse there. They like to roost in the branches of the trees, and there were so many they filled all the branches, all the trees, down to the lowest branches. So that's pretty amazing to have seen that, which I never did. By the time I came around, I had no knowledge of *any* blue grouse in SȽIDǴEŁ, when at one time there were so many; it was likely an astounding thing to see. (p.c., June 29, 2023)

Place names can be seen as a record or connection to history. The name SȽIDǴEŁ is descriptive of its own qualities, and also provides a direct connection to ancestors who lived on the land. Place names are also a way of seeing cultural worldviews in the language. There is a reciprocity which is communicated in the language, and "the land also wants to hear its name.... So, it's intimate, and it's personal. When you're learning your language" (Belinda kakiyosēw Daniels, p.c., February 15, 2023). Earl related how the W̱SÁNEĆ school board named the SENĆOŦEN immersion school, saying, "they even named the school LAU,WELȽEW̱ after our sacred

mountain, LAU,WELN̲EW̲ saved us from the great flood" (p.c., June 29, 2023). LAU,WELN̲EW̲ means "place of refuge". Naming the school after the mountain that saved their people has symbolic importance and links the school to that place of importance. Place names and their stories show many of the ways names connect speakers to land. Place names relate events, as well as being descriptive. Earl Claxton, Jr., further speaks to this, sharing another place name which relates the history of the location, explaining,

> there's a place on the beach here in Tsartlip, ḰENES, it means whale. And it's really a, where the clam garden is, it's quite big across where the creek comes out, there's a big opening there. And it's called whale because one time a whale died in Brentwood Bay and its head got wedged into that spot, and the whale's head touched both banks. And it's quite a ways across, must have been a pretty massive whale to be in there. So that's really an amazing thing to see (p.c., June 29, 2023).

Place names keep records in the language in descriptive ways, tell stories and relate history. They connect place name users to the land in tangible ways and keep those records of interaction with the land alive. Learning place names means connecting to place and history. As June Johnson explains,

> It's important for me to work with TEK because I've gone over to Quadra, and when, when I used to go to school there... at the back of the school there used to be wetlands, and they covered it all up, so now then I went back last year and, and went there, so now they've dug it all back up to put it back to wetlands. And also naming some of the places, the names that we called in our territory. Like there's different names for different places where our villages were on Quadra. So, and

> then even the wetlands, and putting the name in our language and the English underneath. So it's sort of getting done, you know (p.c., June 9, 2023).

Reverting the landscape to its natural form is paralleled with restoring place names in this quote. Learning TEK means connecting to history and identity, as well as learning and enacting Indigenous ways of knowing and doing. In this way, learning language through TEK can directly support language revitalization and reclamation efforts.

4.2.4 "We've always been protectors of our land and water" (June Johnson): Learning TEK is learning to understand the land and the language

> We've always been protectors of our land and water. So that has been going on, but now to teach the young people, the same as what was done in the past, and make sure that it's not overharvested – because, unfortunately, a lot of the clear-cut logging has taken away all those plants that were the non-timber forest products, like that grow underneath the trees. So, it's important for them to check out these areas, if there's any plants there, because like I said before, sometimes it's two hours to find a good place to get plants, and you've got to always watch that there's no contamination from oil spills from the logging companies. And people aren't over harvesting, that there's not going to be any for future generations. So, like it's so important to carry this on [so] that we don't lose sight of how important it is to learn about our territories, about our plants, our trees (June Johnson, p.c., June 9, 2023).

Protecting and monitoring the land keeps it from harm and helps pass it onto the next generations, along with those values which protect the land: Activities such as harvesting,

clamming, fishing, gathering, or trapping are ways of interacting with the land. Caring for the land comes from interaction and familiarity with it. Earl Claxton, Jr. discusses the importance of proper stewardship of the land and waters, as well as the dangers of poor stewardship, saying,

> it's the ones that make the decisions, the politicians, that make the laws and those things and their ministries, like fisheries and oceans, their... job was to manage the salmon, and they're failing, and not able to stem the decline of salmon...I don't want to be having to show a picture of a salmon and say, this is what they used to look like. And they're extinct or they're gone, now. I hope that day never comes" (E. Claxton, personal communication, June 29, 2023).

Learning to be a steward of the land means learning how best to treat the land with respect and reciprocity – protecting both history and future. Language carries this respect in its lexicon; as Belinda kakiyosēw Daniels tells us,

> when referring to the sky, the sky in Cree is *kîsik*. We spell it *kîsik*. That's 'sky'. 'In the sky' would be *kîsikohk*: 'in the sky', 'on the sky', 'at the sky', so it's kind of like a locative. In, on, at. And the word for 'day' comes from the root word *kîsik, kîsikaw*. So, again, I'm giving you a relationality lesson. To see the sky, *kîsik*, is day, but yet, how it relates to my body, *miskîsik*, my eyeball. Which is related to the sky and universe. So, our bodies are a reflection of the land and language comes from the land. So that's an easy, quick little lesson. Cause lots of people often ask me that: 'what do you mean, language comes from the land?' So that that's one example (p.c., February 15, 2023).

Learning TEK and language teaches learners to understand the land and how to interact with it: not just about weather, winds, tides, and seasons, but also how to show gratitude to the land and the proper protocols for hunting, fishing, and harvesting. How should one treat the land? How should one navigate the land and waters and one's relationship with it? These are enormous questions which learning TEK can help to answer. Continuing TEK involves practices of stewardship and sustainability. A responsibility to land was emphasised by multiple experts; the idea that caring for and stewarding our planet is of central importance. Language comes from the land and interaction with the land, such as TEK, connects speakers to their land and their language both. Language revitalization connects learners to their language and to traditional knowledge. Understanding the land can come from both understanding and learning TEK and language.

> They shot this bear, black bear, and it didn't die, it took off. And they went to look for it. He found the Sitka spruce tree, where it had pitch, and he was rubbing where he got shot. Something that might help heal him. Unfortunately, he died, because he had quite a few bullet holes, but that's what he did, he went to find a tree, and they found him by the spruce tree where he'd been rubbing himself, trying to get the pitch to go into his wounds. So, the animals also know what are good medicines (June Johnson, p.c., June 9, 2023)

In this story there is respect for animals' knowledge as well as for the way they can teach us. Using pitch to protect wounds and staunch bleeding is knowledge which came from observing the land. With this example, there is a lesson of how one may learn tangible knowledge directly from nature; we can see how interacting with the land can teach us. Understanding the land, such as seasonal rhythms, weather systems, and how our actions affect the land helps provide context

and connection to language and culture. Earl Claxton, Jr., also speaks to how long involvement and study of the land leads to generational knowledge:

> the Saanich found that if the roots were disturbed on the camas, they become bigger bulbs. It encourages bulb growth. So what they did was, they had fields of camas that, that they would dig up, and they had grass fields in amongst it, so they could cut, cut out sections with a digging stick and roll up the sod, and then take up the ones, the bulbs that they wanted, and roll the sod back. And that was enough to stimulate the bulb growth, was that rolling it up out of the ground, and then rolling it back and starting over again and wait 'til next year… It's amazing technology, I think. They found ways to do things and, I don't know how they found out about them becoming bigger bulbs through being disturbed (p.c., June 29, 2023).

Understanding how to encourage growth in camas bulbs is knowledge that came from careful observation and directly contributed to survival: camas bulbs have historically been an important food source for W̱SÁNEĆ people. Belinda kakiyosēw Daniels discusses how her language grounds her in the land and nēhiyaw worldview, she says,

> Well, land is alive. And we can ask through the use of protocol, to have land, sun, the trees, the plants to help us. Our language gives us a worldview, gives us a perspective, and how to relate to the land. It's a kinship system embedded in the language for us to also help the land. So for instance, if we think of trees as our kin, such as brothers and sisters, *mîtosak*, and they're alive with spirit. And I told you, the teaching around askiy is *kîskiwamagan* -- the word for Sky is *kîsik*, but

> for in the sky would be *kisikohk*. Which is also...related to what we see to our body parts." (p.c., February 15, 2023)

In Cree, reciprocity towards the land or taking care of the land is seen in the language. Revitalizing the language means more than rote memorization of vocabulary and grammatical rules; when learning language, one learns culture and worldview, as well. Relationality means looking at the interrelations of all things, which is important when considering how to approach different aspects of life and the world around us. To care for the land like this takes prior knowledge of many things: knowledge of what a healthy forest looks like; knowledge of how to harvest respectfully and sustainably. Additionally, this knowledge has to be carried and passed on. As June emphasises,

> the time of harvesting, the length of it, and then the fall, what do you do to take care, if you've got plants ... near where you live, how they can take care of them. It's really important for us to take care of our resources. In, around our community (p.c., June 9, 2023).

This interaction with the land can lead to insights which come from knowing the land intimately. In a similar vein, Earl Claxton, Jr. discusses how recognizing interrelated factors in nature leads to greater understanding of the land:

> When [ocean spray] turns brown, the flower, that's time to head out and set the reef nets. So, it was kind of our clock, I guess. Because when it first bloomed, which is just starting right now, the bloom, it, the people that ... worked on the reef net, they would be scrambling to finish any parts of the net they needed to finish or attach, attach them together. And it would start to get more frantic ...

> ‘cause when it turns brown, it’s time to go out and catch the sockeye (p.c., June 29, 2023)

This quote shows how interrelated things can be; it also shows how knowledge of the land is immediately beneficial. Setting the reef nets and catching sockeye salmon brings in a large amount of food; it sustains the community. This knowledge is important to survival. Understanding that when ocean spray flowers turn brown means salmon is coming, and knowing what to do about it, means knowing many separate elements about seasons, weather, fish migrations and mating patterns, and botany. As Betty Wilson emphasises, this knowledge is complex. She mentions,

> Those [Skidigate Island] fish traps have... an element of physics in there. Because it’s on an island, there's another island here; they had to know the flow of the tides. And Drew knows this, being a skipper, from you know, canoe charts -- but you can use a flow of the tides, but the people who live there had to know where to build the fish traps for best use, where they could catch the most fish (p.c., April 14, 2023)

This intimate ecological knowledge comes from a long relationship with the land. Understanding these intricacies is necessary to create efficient and productive fish weirs; understanding the ocean is a necessary skill to manipulate or navigate those waters. As Earl Claxton, Jr. relays, this is something which was necessary to learn when transit happens on the water, saying,

> [My father] was able to navigate from Stewart Island out in the Gulf Islands to today. I thought it was a really amazing thing for a 7-year-old to travel by himself in the treacherous waters, and no one ever thought anything of it. It wasn’t a big

> thing then; it was something that was expected of all of them (p.c., June 29, 2023).

This knowledge of how the islands are formed, of how to navigate them, of how to exist alongside them, is formed from being on and with the land and waters. To know and understand a place is to care for it; as June Johnson relates, "I always thank the Creator for what I'm taking out, only take what I need. I don't over harvest, cause you need to have them for the next generation" (p.c., June 9, 2023). This understanding of relationality can provide context for language, which supports ILR. June similarly discusses how it is clear when the land is not being cared for as it should, and how that impacts people, as well, saying,

> the huckleberry grows where there's stumpage after the logging, and that's, the only sad thing I see when I'm driving around is all those brooms are suffocating the plants on the ground now that the trees are all cut down. I told them they need to do something about that, because it's not really fair to anybody ... when they're spraying for alder, they'll have signs up 'do no pick berries here because it's sprayed', so now you're looking around for places that *aren't* sprayed (p.c., June 9, 2023).

It is clear when the land has not been cared for as it should be: it impacts not just the forest and the plants, but also the humans who interact with them. Understanding how to interact with nature in a good way is imperative. TEK is about understanding and investigating nature: learning the language can illuminate how to do that. Supporting the domains of knowledge and vocabulary which might otherwise not be as well understood is vital for a revitalization movement, as it bring more than words with it.

4.3 Conclusion

In this section, we have seen what the experts imparted about how TEK and ILR are inseparably intertwined. This is an attempt at as comprehensive an exploration as possible and to convey the words of the experts as faithfully as possible. The four themes which emerged from the interviews – learning by Doing: Including TEK in language lessons and vice versa; language reclamation, TEK, and identity; learning worldview through TEK and language; and learning TEK is learning to understand the land and the language – begin to answer the research questions posed at the beginning of this project. The separate themes are interrelated; some of each may be found in the others. The interconnectedness of these themes helps show how clearly and fundamentally both TEK and ILR are connected.

The first research question was, how do communities include TEK in their language revitalization work? We can see that learning on the land and hands-on methods are used to teach TEK with and through language. Additionally, the content of lessons can achieve the goal of teaching TEK through language by learning vocabulary or skills. Language comes from the land, and so the land is present from the beginning in language learning. TEK, which is a way of interacting with the land, is a natural extension of that.

The second research question was, what are some of the effects of including TEK in Indigenous language revitalization work? Learning TEK along with language helps forge pride and connection to identity, which supports language revitalization and reclamation (Leonard 2011, 2012). It also helps provide the context of and Indigenous worldview which Indigenous languages are situated within. Learning the conceptual backgrounds to the words often means learning about the land one is on. Learning TEK helps speakers understand the land they are on and that understanding, in turn, supports their language learning. Additionally, language

revitalization can include efforts to expand domains in which language is spoken. Learning specific domains of knowledge or skills – such as fishing, weaving, or medicine – not only perpetuates those language domains but also the accompanying cultural knowledge.

The last question was, what about TEK is important to Indigenous language revitalization? From these interviews, it has become clear that TEK is foundation in Indigenous language revitalization. From vocabulary to place names to worldview, it is clear that ILR without TEK is not possible.

All four experts communicated hard work and monumental success in their interviews. We have listened to the voices of experts in language or TEK explain how learning one supports the other. They have shared the many different ways for this, which include: learning TEK in language lessons; importance of this interaction in language reclamation (found in connection to land in language, creating space for and encouraging pride in language; teaching with Indigenous pedagogy); understanding the worldview behind the language (including toponymy); and understanding the land through language and TEK (which includes caring for the land; connection to history on it; and understanding worldview present in language). Additionally, the experts have also shared ways to support these endeavours. Another message that was communicated was the inclusion and recognition of TEK in western institutions. Including both instruction of and respect for TEK in the language helps knowledge and awareness of it grow, as well as growing domains where the language is spoken. There are so many different parts to TEK that one person can't know or understand all of it: one person could dedicate years to learning how to carve, how to weave, how to make medicines. But that is also the beauty of it; TEK relies on a community of people to learn, understand, and pass it on, just like language. It is

shared and enjoyed communally. I would like to end this section with Drew Blaney's message of encouragement:

"We're still learning. But I think there's a willingness to learn and, you know, want to learn. So… we have to keep our foot on the gas pedal and keep moving forward" (p.c. April 14, 2023).

5. Website survey

5.1 Website Survey Introduction

In this section, we investigate the role of TEK in ILR in an online context with a website survey. The goal of this website survey and review is to provide supplementary insight to aid the literature review in contextualising this research. A literature review is a "document or section of a document that collects key sources on a topic and discusses those sources in conversation with each other" (Purdue University, n.d.). Likewise, in this website review, we will be looking at websites through the analytic lens of the research questions (How do communities include TEK in their language revitalization work? What are some of the effects of including TEK in Indigenous language revitalization work? What about TEK is important to language revitalization?) and the themes which have been developed in order to answer them. The findings show that these websites complement the themes which emerged in the interviews with experts, with one difference being that many of these websites are necessarily less centered around place. TEK is included in language work on these websites in the learning material, largely influencing content. Some of the effects of including TEK in ILR online is creating lessons which are closer tied to the land: there may be plant identification instructions, interactive language games which relay or depict TEK, or opportunities to meet in person on the land. TEK is important to the ILR content on the websites as it helps convey a deep connection to the land.

The website review provides a different perspective from the literature review: because most of the websites are run by community language organisations, we can see what communities' language work looks like outside of the institutions which normally produce published, academic language work. Although inspired by Parker (2012), this web review has a much different purpose. In Parker (2012) it was primarily to investigate the efficacy of online

learning at place-based language learning. There are many individual technologies which must work in tandem to produce a useable, useful version of the internet (such as speech technologies, character recognition, keyboard layouts, spell checking, and CALL (Computer Aided Language Learning) (Littel et al., 2018) and deserve their own attention; however, we will only be looking at what a website may show us. Here, the web review provides a necessary extension of the literature review. Finally, it is worth noting that this is no substitute to talking to people involved in language revitalization work; this website survey is used to inform and contextualise interviews and expand the literature review. Below, first I lay out some context for the internet, ILR and TEK in sections 5.1.1-5.1.2; I then begin to discuss the website review for this thesis in section 5.2, its methodology in section 5.2.1, and its results in section 5.2.2. Finally, I discuss four specific examples of these websites.

5.1.1 Internet and ILR

Before we discuss the specific application of this website survey to ILR websites, let us discuss the wider context in which it is situated. The internet and its uses and available resources have been in perpetual evolution ever since its inception; Indigenous Language Revitalization websites show a similar growth. Sources for language learning have proliferated since the conception of the internet, becoming more user-friendly and comprehensive as the years have gone by. Online resources include dictionaries, phrase books, and language-learning apps, with purposes such as “Facilitation, Communication, Digital Information, Digital Negotiation, [and] Digital Creation” (Meighan, 2021, pg. 399). As the internet has matured, the goals and interests of websites have evolved and the internet “is viewed as having increased user creation, cooperation (Barassi & Treré, 2012) and a decentralization, localization and democratization of power” (Meighan, 2021, p. 400). Advancements in accessibility, such as keyboards and

spellcheck in individual languages, or, for example, ʻŌlelo Hawaiʻi, for which a Google search engine is available (Galla, 2018), have also paved the way ahead for more ubiquitous use of Indigenous languages online.

Internet resources for ILR are varied and come in many forms. They are important due to their accessibility: they are often free and may be conveniently used anywhere with an internet connection. In-person lessons which require transportation to and from a location may present a difficulty for those living without easily accessible transportation or without time in their schedule for lessons, with the result that "ILR initiatives have more widely implemented digital technologies with the view of enabling Indigenous language speakers and learners, in both remote and urban areas, to access informal, formal and self-directed language and cultural learning opportunities" (Meighan 2021, p. 400). The spread of online and digital technologies has helped reach learners who might otherwise have more difficult access to resources.

A common and helpful online resource is online dictionaries, which present their own advantages and challenges. The format of an online dictionary has several key advantages to physical dictionaries: they are more easily updated and may even provide opportunities for user interaction (leaving comments, playing interactive games). The websites featured here, which are dedicated to language revitalization, will often include more than online dictionaries, featuring stories, pictures, and sometimes videos and recordings of speakers alongside a dictionary or wordlists. Some provide accessible worksheets and short lessons on specific themes, such as the weather or family. Beyond what an online dictionary provides, many of these sites are meant to be engaging and fun to use; while they do not entirely provide a substitution to learning language from an in-person teacher or mentor, they are an important aid: "the icing and not the cake" (Brinklow et al., 2019, p. 2).

Challenges with online ILR resources are often related to the internet as a whole. Creating one's own webpage can be both time and resource consuming. More fundamentally, the internet was invented and designed largely for western cultures and languages, and may not always accommodate non-western cultures and protocols. Using pre-made website frameworks, such as Wix or Squarespace, while convenient, may bring their own challenges: some orthographies, for example, may not be supported. Finally, some websites may be set up and thereafter never maintained or updated. These problems, of course, have solutions, as we will see in these two different examples. FirstVoices (FirstVoices.com, 2024) seeks to address these issues.

FirstVoices is run by First Peoples' Cultural Council in British Columbia, is an ILR website platform created in order for "Indigenous communities to share and promote their languages, oral cultures and linguistic histories" (FirstVoices, 2024). FirstVoices supports language documentation, provides a repository for archival material and provides a format with which users (i.e., communities) can restrict material to just community members including searchable word lists, phrases, stories, recordings. It has also developed downloadable keyboards for over 100 Indigenous languages which are supported on a PC or smartphone. It is internationally recognized as a place where communities can gather and curate their own language materials.

5.1.2 Internet and TEK

Now let us turn to an overview of how Traditional Ecological Knowledge can be shared online. The use of the internet and TEK is paradoxical: TEK is necessarily local, place-based knowledge; the internet is "inherently global and disconnected from any particular place" (Parker 2012, pg. 81). TEK is knowledge which has been gained collectively by many people over

millennia by intimate, prolonged contact and observation of the world around them, passed down from person to person over generations; the internet as a medium for sharing information is de-personalized and comparatively brand-new. However, digital platforms, much as they have provided space and accessibility for many language initiatives, likewise provide opportunities for those who wish to share and uplift traditional knowledge. This comes, again, with similar foundational problems which challenge ILR websites:

> "Although digital platforms provide venues for potential local knowledge exchange and communication, this same technology has suppressed Indigenous alternatives and worldviews (Mander, 1991)—rendering local knowledge invisible by declaring it non-existent or illegitimate...destroying the reality which they attempt to represent" (Shiva, 1993, p. 12, as cited in Galla, 2018, p. 107)

The internet uses predominantly Western frameworks and the English language to operate; in such a virtual realm, inherently *local* knowledge (i.e., TEK) can be decontextualized. Some technologies, however, have been used to great effect, such as the arctic ice-mapping platform SIKU, which maps arctic summer sea ice and "combines the oldest knowledge with the most modern technologies" (UNESCO, 2019, p. 20, as cited in Meighan, 2021). SIKU provides a social media platform and offers real-time maps for hunters and others who wish to venture onto sea ice, with the goals of education, stewardship, and community-based monitoring. SIKU also supports multiple dialects and encourages Inuktitut sea ice terminology, wildlife reports, and use of place names (Arctic Eider Society, (n.d.)). This platform also provides an example of how this online combination of TEK and the internet can work in tandem with Western science: while the goals that the creators pursue are "increasing youth engagement, helping bridge the larger scale jurisdictional challenges faced by the region, and sharing results and coordinating in near-real

time" (UNESCO, 2019, p. 21), a side effect of this program's inception is that the tracking of sea ice supports western science's parallel research goals of understanding sea ice boundaries and movement.

This influence of TEK on western science is not unusual; it ought to be approached with the proper gratitude and acknowledgment, as "researchers—typically from outside the community—often gain knowledge and academic qualifications with little to no benefit reciprocated back to the Indigenous community" (Galla 2018, p. 106). Reciprocity is a key requirement, but weaving together both TEK and western science can be mutually beneficial, as "with digital technology, communities are now equipped with common tools—including word processing and desktop publishing software—that give authority and empower Indigenous peoples to author, illustrate, print and publish their own language and culture materials (Bernard, 1992; Galla, 2010, 2016)" (Galla 2018, p. 108). The use of data and its accessibility online is something which must be considered: who owns Traditional Ecological Knowledge? Is it a group? Is it a single person? How can this knowledge be protected from exploitation, while at the same time remaining true to the tradition of open participation and sharing which created this knowledge? Also, should this information be taken out of context of its oral tradition, and used in written literature? Who will have access to it? The data rights and ownership of TEK raise complicated questions, particularly as they fall under the jurisdiction of western institutions such as universities (Grimes, 2011; Geniusz, 2006). Often, knowledge or data is handled without respect to those who shared it: "First Nations data is analyzed, interpreted and reported on without consent, approval, review or input by First Nations" (FNIGC, 2014, p. 7)[1]. Additionally,

[1] See the North West Territories Research Institute (https://nwtresearch.com) and First Nations Health Authority (www.fnha.ca) for more ways to learn about how to approach research with proper data care as well as appropriate research and knowledge exchange.

it may be that “research results are not returned to the community or they are returned in a form or language that is inaccessible” (FNIGC, 2014, p. 8). Enabling communities to control their own data, or data sovereignty, is an important basic need. Keeping language data within the control of a community at all stages of language work is vital to the language revitalization process, as is the agency of those communities: FirstVoices is built around those concepts. This platform is an excellent example of how it is possible for websites to be a good fit for sharing language and cultural knowledge as well as following cultural protocols and responding to the needs of communities. It is vital that language communities control what is shown, to whom, and how: the authority must be in their hands. While it presents challenges, the internet can provide a valuable platform to share and encourage TEK worldwide.

5.2 Website Review Introduction

Equipped with this basic understanding of how ILR and TEK are situated on the internet, we can now turn to look at specific websites and attempt a more localised review. This section includes a general introduction of this study, a look at the methodology, an investigation of how this survey fit into the themes developed in the interview, and a look at specific examples of websites. For this study, the website survey encompassed 16 websites, four of which were FirstVoices portals. All were public access and corresponded to the language and dialect spoken by the language experts interviewed (see Table 1: Websites, Web Addresses, and Corresponding Languages) (see Chapter 4: Teachings from the Experts for the language introductions). Sites which displayed copyright dates were recently copyrighted, with years including 2015, 2019, and 2023, so we can be sure these are in-use and current, although it is important to keep in mind that the internet is often more temporary than one assumes, and some of these sites may have differing content or formats, or may no longer be up within several years of this thesis’ creation.

These sites were not all singly focused on Indigenous language revitalization, but all included language components. They were overwhelmingly hosted by community organisations or local school boards. Exceptions include FirstVoices, which is an initiative of First People's Cultural Council that provides a portal for communities, and University of North Texas linguist Timothy Montler's SENĆOŦEN online grammar and dictionary[2]. Most sites in this review fell under the size category of large, with three medium sites. All but one website, likwalamas.com, had site navigation in English, while content (including song and story names) was a mix or bilingual with English and each Indigenous language. In all these places, one finds information about or related to both TEK and associated language learning: animal and plant names, seasonal charts, place names, and more.

Looking at attitudes towards TEK helps us see how language learners and teachers feel about TEK and its connections with ILR. Attitudes towards TEK may be shown in respect for the land in songs or the way there may be opportunities for learning on the land. Often, one of the major semantic domains used to categorise word lists is ways of understanding the land, including animal or plant names as well as place names. This shows that TEK is an integral part of Indigenous language learning and that they walk hand in hand. This review allows us to view another facet of this work and see how modern technology is used to further the goal of learning both TEK and ILR. One caveat which is important to keep in mind is that TEK is not limited to what appears on these websites. Deeper understandings such as food preparation, medicine making, and the actual actions and practice that go into carving, being a good canoer, building good fish weirs, understanding animals' habits in order to hunt, are all things that often take

[2] FirstVoices provides a platform for each community; however, the content varies by language and dialect, including whether or not the website has songs, stories or pictures, or is publicly accessible.

practice and hands-on learning, beyond learning about it in videos or reading about it on a website. The internet, from social media to online dictionaries to ILR websites, presents many opportunities for the sharing and uplifting of ILR movements.

Below, Table 1: Websites, Web Addresses, and Corresponding Languages presents each website surveyed for this chapter, its web address, and its corresponding language.

Table 1

Websites, Web Addresses, and Corresponding Languages

Language	Website Name	Website Address
Kwak'wala	U'mista Potlatch	https://U'mistapotlatch.ca/enseignants-education/cours_4-lesson_4-eng.php
Kwak'wala	Comox Valley Schools	https://www.comoxvalleyschools.ca/indigenous-education/kwakwala-language-resources/
Kwak'wala	First Voices: Kwak'wala	https://www.firstvoices.com/explore/FV/sections/Data/Kwak'wala/Kwak%CC%93wala/Kwak%CC%93wala
Kwak'wala	Likwalamas Blog	https://www.likwalamas.com/blog
ʔayʔaǰuθəm	Comox Valley Schools	https://www.comoxvalleyschools.ca/indigenous-education/program-services/
ʔayʔaǰuθəm	First Voices: Sliammon	https://www.firstvoices.com/explore/FV/sections/Data/Salish/Northern%20Salishan/Sliammon
ʔayʔaǰuθəm	School District 47 Web Portal	https://portal.sd47.bc.ca/group/h2t6q57/Pages/default.aspx#/=
ʔayʔaǰuθəm	JehJeh Media	https://jehjehmedia.ca/
ʔayʔaǰuθəm	The Raven FM	https://www.theraven.fm/language-and-culture/
nēhiyawēwin (Plains Cree)	First Voices: Salteaux First Nation	https://www.firstvoices.com/explore/FV/sections/Data/Plains%20Cree%20(Y)/Cree/Cree%20(Saulteau%20First%20Nation)#:~:text=We%20are%20the%20Saulteau%20First,dialect%20(northern%20B.C.%20style)
nēhiyawēwin (Plains Cree)	Kingston Indigenous Language	https://kingstonindigenouslanguage.ca/language-activities/cree-activities/
nēhiyawēwin (Plains Cree)	Newhiyawewin.com	https://nēhiyawēwin.com/
nēhiyawēwin (Plains Cree)	Cree Literacy.org	https://creeliteracy.org/category/learning/science/
SENĆOŦEN	FirstVoices SENĆOŦEN	https://www.firstvoices.com/explore/FV/sections/Data/THE%20SEN%C4%86O%C5%A6EN%20LANGUAGE/SEN%C4%86O%C5%A6EN/SEN%C4%86O%C5%A6EN/learn
SENĆOŦEN	Timothy Montler's Saanich Word list	http://saanich.montler.net/
SENĆOŦEN	PEPAKEN̲ HÁUTW̲	https://pepakenhautw.com

5.2.1 Methodology of Survey

Information about websites was gathered between January and June, 2023, with most analysis occurring in May-June, 2023. Table 1 presents a total list of web addresses and the sites' corresponding languages. The search for websites was accomplished using the internet search engine Google, using terms "learn [language]," "learn [language] online," "[language] learning," and "[language] place-based learning". Websites were then treated to a brief inspection using the below checklist to ensure they contained robust enough data to be included: a minimum of three of the below features was required:

- Word lists
- Phrases / phrase book
- Dialogues
- Dictionary
- Language games
- Metalinguistic discussion (i.e., grammar explanations)
- Songs
- Stories
- Videos/Audio files
- Other:

Are there options for interactive learning or posting user-generated material on the website?

This short checklist was first developed by Parker (2012, Appendix E), and the survey framework provided by Parker (2012) was used to provide a starting point for how I might approach my own research. However, because this study is looking at different concepts, the

specific substance of the questionnaire was altered to be pertinent here. For the first half of the questionnaire, which posed basic questions about the sites such as language, size, and web address, I chose to keep the original content, as I saw no reason to alter such a thorough preliminary investigation. However, the second half of the questionnaire was altered (see Appendix E). In addition to changing the questions to focus on Traditional Ecological knowledge and how it was included in these ILR websites, I did not include such clarifying questions provided in Parker (2012) (meant to support larger, more open-ended content questions) such as "how many" and "where".

This website survey is composed of an examination of 16 websites. The goal was to gain a deeper look and a different perspective from the information contained in academic literature in the rest of the literature review; therefore, websites collected were not necessarily oriented specifically towards language revitalization. Instead, websites were required to possess a minimum of three to four of the below criteria for selection. This had the effect that some websites are more focused on (for example) ethnobotany or radio programs. Additionally, this had the effect that several blogs were included in the study. This is what was hoped for: to collect information from small organisations or individuals along with larger organisations. This was intended to be as thorough a survey as possible for the specific languages, with the caveat that only the specific dialect of nēhiyawēwin was looked at for Cree. The Cree dialect continuum is vast with large differences in culture and in dialect, in addition to a robust language revitalization movement. Therefore, it was decided that to search for every website for Cree would be overwhelming.

The general form of a literature review looks at specific scholarly works in relation to the literature as a whole; this web review is similar in form, in that it allows us to look at different

websites in relation to each other. The use of a survey allows for a consistent method of reading and analysing each website, so that together, they can begin to form a bigger picture of how online learning impacts the answers to the foundational research questions of this thesis (How do people include TEK in their Indigenous language revitalization work; what are some of the effects of including TEK in Indigenous language revitalization work; and what about TEK is important to language revitalization? Next, what was the best way to go about answering those questions?). This web review provides context for interviews (like a literature review does); however, it only looks at the specific languages spoken by the experts. Like the literature review, it follows themes which were developed from the interviews. The depth to which TEK is addressed varies from website to website; some websites may include instructional videos demonstrating, for example, fishing or wild rice harvesting; others do not focus specifically on TEK, though it may be included in stories or pictures. Some websites are more oriented towards goals outside of ILR – for example, one site included here is a radio site; however, they include enough of the criteria and I think this also helps to showcase the myriad of ways and places where ILR and TEK can be supported, promoted, and embraced alongside other efforts.

5.2.2 Web survey results

5.2.2.1 Media Content

The media content of the web review was one of the most straightforward categories, following a checklist provided in Parker (2012)'s website survey framework. The checklist used to inspect media content included sound files, videos, stories, pictures, maps, and links to other websites. Media content is a simple, clear way to view content and form.

Most sites had sound files or videos. Audio files could include pronunciation of words, stories, songs, prayers, or recorded lessons. Videos included skills one can acquire (weaving, trapping, fishing, sewing, planting, harvesting), knowledge about the land (seasons, weather, time of day) animal names and behaviours (seal holes, herring), plant uses and names (weaving cambium, birch water), or videos explaining importance of TEK such as cedar bark harvesting. Also included were stories, songs, and prayers, the topics of which included stories about animals, personal histories, origin stories, songs of gratitude, seven directions teaching, strawberry sisters story, three sisters learning, and more.

Stories include topics such as how people act or should interact with the land; they may include origin stories, personal histories, or community histories. They may also include moral lessons or information about the actions and habits of animals and plants.

All but one site (Timothy Montler's SENĆOŦEN wordlists and grammar) had pictures, whether those were illustrative, diagrams, or decorative, such as seasonal diagrams, pictures of traditional cultural items, illustrations of specific vocabulary, or images of people engaging in TEK, such as skinning hides, planting the three sisters, the seven directions, the six seasons, thirteen moons, and solstice traditions.

Of all the media content, maps and links were the least included. Maps showed traditional territory and place names, which did not come with name etymologies. They were interactive on several sites, where clicking on a placename would play the audio recording of that name, sometimes with the English name present. Maps are important to include in the survey of media content: they relate to a sense of place, and place names, of course, are strongly connected to

history and the perception of a local landscape (Basso, 1996). Place names support language revitalization by teaching and showing a connection to the land in language.

In the three websites where they were present, links generally connected to other language learning sites (or language learning pages hosted by other sites or to social media, such as Instagram, YouTube or Facebook). Some websites even had a separate page of outside resources for users who wish to learn more or keep exploring. Links to other sites are important because they demonstrate the interconnectedness of many specific websites; additionally, links to social media sites allow for more user interaction and online community building.

Inspecting various types of media content allowed me to begin to take a deeper look at each website and how it might be run, what the goals of the creators or hosts were, and how they worked to accomplish those goals.

5.2.2.2 Educational Content

Educational content looks at the specific categories of language learning material which a website may contain. Looking at the educational content of these websites helps us to see what is used in order to teach: the vehicles of information, as it were. The following table illustrates how many of the websites had each different type of content. The selection criteria for each website to be included in the website review included having at least three of the following:

Table 2
Educational Content

Content	Number of Websites
Word lists	16
Phrases/Phrasebook	16
Dialogues	3
Dictionary	5
Language Games	14
Metalinguistic discussion	5
Songs	9
Stories	15
Videos	10
Other	9

This table shows us that all of the websites included wordlists and phrases, while only three included dialogues. Three of the websites had options for user interactions other than interactive games, such as enabling users to comment on posts or articles. These numbers tell us that most of these websites invite user interaction and use stories and videos to share language and culture.

5.3 Web Review Results

Here, we begin to look at the results of the website review. A literature review finds answers to research questions in the pertinent literature as well as comparing different works within the literature (Purdue University, (n.d.)). Academic literature is usually composed of rich text and clearly outlined concepts. Some of the challenges with websites included the relative lack of text. Although there are clearly delineated sections (i.e., separate web pages), underlying and connecting theories are often less explicitly stated (the exceptions here being “about us” or “our story” sections which usually work to underscore the overarching mission of the organisation which runs the website). For these reasons, the web review was challenging to execute, though it was necessary and useful to this thesis and provided insight into community-

based ILR work and how the themes which were developed from the interviews are also supported online.

The four themes developed from the interviews form the framework for the literature review as well as for this website review. If a standard literature review is meant to help answer our research questions and illustrate gaps in the literature, then so must this web review. Therefore, we must present the themes which support the answers to our research questions alongside their supporting presence and influence online. These websites complement the themes developed from the interviews and support those findings: that TEK and ILR are interconnected in many ways. The website review shows differences from the interviews in different ways: firstly, that the medium of instruction is purely online; secondly, that the materials included are oriented directly towards language learners. Below, we will see these themes: TEK and language taught together or concurrently; Concepts behind the words; Living TEK and language reclamation (teaching using Indigenous ways of knowing and doing and being); and Understanding land through language. We will see how these themes are present on websites.

5.3.1 Learning by Doing: Including TEK in language lessons and vice versa

This theme, TEK and language taught together or concurrently, refers to how TEK is often taught and learned alongside and at the same time as language, which may involve using hands-on instruction or learning specialised vocabulary. The website survey referred to or embodied this theme by having instructions or vocabulary available to learn from, like on the site for the cultural centre U'Mista Potlatch. On this site, students learn names for different parts of cedars, the significance of cedars, and prayers to the young cedar. This is so that learners can acquire the specific skills and knowledge of one area of TEK and, in doing so, learn associated vocabulary.

Most websites have opportunities (such as wordlists or downloadable worksheets) to learn vocabulary for nature words such as animal and plant names, materials. Websites may also have vocabulary about interacting with the land such as plant/animal identification, gathering, hunting, creation of cultural materials derived from the land like processing hides, cedar weaving, steaming canoes, and more. Some websites have instructions for TEK with language. In particular, in Kwak'wala, the cedar, or Tree of Life, has detailed terminology to refer to specific parts or qualities such as the inner bark or cambium, which appears on websites such as the U'Mista potlatch site.

Story telling can also embody this theme when used to teach language. Stories can include new vocabulary and different narrative forms and can also impart TEK. On the website for the radio station The Raven FM are stories which discuss fish bonking, bear and berries, and fish and flies. On the web portal "FirstVoices Sliammon" are stories about fishing, springboard cedar logging, chum salmon going upriver to spawn, and more. There are often origin stories which tie the language and people to the land, such as the website for educational organisation PEPAKEN̲ HÁUTW̲ and the story of XÁLS the Creator. PEPAKEN̲ HÁUTW̲ is an organisation which champions reclamation of native ecosystems and community education; they work to restore (among other areas) SN̲IDȻEŁ (Tod Inlet), the place where XÁLS the Creator placed SLEMEW̲, the first W̲SÁNEĆ person (PEPAKEN̲ HÁUTW̲ Foundation, n.d.).

5.3.2 "When we're reclaiming language, land is teacher" (Belinda kakiyosēw Daniels): Language reclamation, TEK, and Identity

This theme, language reclamation, TEK, and identity, includes teaching using Indigenous ways of knowing and doing and being. This theme can be found in the other three themes, just as

the other three themes can be found in this one. The websites embodied this theme with the inclusion of sharing and promoting Indigenous ways of knowing and being, as well as empowering users to learn the language.

Some websites include testimony which emphasises the essential, sacred meanings learners find when speaking their language, such as on the Kingston Indigenous Language site, which teaches nēhiyawēwin (Kingston Indigenous Language Nest – Our voices matter, 2019). A couple of websites have sections of videos or stories, some of which include speakers' personal stories of why their language is important to speak and to learn. Many websites surveyed included explicit affirmations of attitudes of respect towards the language and land. Some websites had community members share about the traumas of residential schools and what reclaiming their language means to them, and some include external resources for healing. Some downloadable worksheets encourage learners to discuss what learning their language means to them.

Sites may have instructions or guidelines on how one should approach learning on the land (or learning about the land), as well as correct protocols and songs or prayers of gratitude when harvesting or gathering, as on U'Mista Potlatch or Cree Literacy.org. Introductory material may also provide guides on respect and reciprocity when discussing a relationship with the land. For example, the PEPAKEN̲ HÁUTW̲ website states, "it is our responsibility to protect native ecosystems, and to share our knowledge and teachings about restoration practices. PEPAKEN̲ HÁUTW̲ hopes to inspire community members to take an ecological approach to return native plants across the W̲SÁNEĆ homelands" (PEPAKEN̲ HÁUTW̲, n.d.). This quote shows care and a relationship with the land and explains how PEPAKEN̲ HÁUTW̲ approaches responsibility for the land. Connection to the land can deeply influence one's sense of identity.

Reclaiming language is more than learning to speak a language, it is also learning to feel pride in one's language and identity. Teaching using traditional methods about one's culture can strengthen a connection to identity. Reclaiming traditional Indigenous methods of language teaching includes teaching using hands-on methods or teaching on the land, as well as what Stó:lō scholar Jo-Ann Archibald terms "Storywork" (Archibald, 2008). Stories are usually accessible either under a separate tab or integrated throughout the website. Examples include Likwalamas Blog, which has thoughtful and informative videos on nature terms with accompanying visuals, as well as the story of We Wai Kai and the Flood. Another example includes the Comox Valley Schools site which has stories on the Flood, Raven releasing the sacred fire, the sacred circle, Wedlidi Speck reading Little Giwas and Little Uligan, and Gluaskabe and the River. On many sites there are translations for titles and content. However, this is not seen on every website, as several have stories monolingually in their respective Indigenous language. In this website review, we can see some of the ways this theme of living TEK and language reclamation is being enacted, as well as some of the ways in which people are reconnecting to their language.

5.3.3 "It's not just words, but also concepts" (Betty Wilson): Learning worldview through TEK and language

This theme, concepts and worldview behind the words, is about learning and understanding worldviews which support language and are carried in TEK. The websites embodied this theme in several ways. We have seen how a single word may have a conceptual understanding which is more detailed than a direct translation, as well as how this affects such areas as toponymy or language documentation and archiving.

Toponymy ties into this theme because placenames often relate a description or history of a place. These names can be used as stories which tell about the land and peoples' interactions with it. One way to show this connection and interaction is with maps. On the websites surveyed, maps were not commonly seen. However, several sites included traditional place names as well as their history and significance. These sites included the PEPAKEN̲ HÁUTW̲ website or Timothy Montler's SENĆOŦEN dictionary and grammar website, which has a list of place names. Additionally, FirstVoices portals had place names and their English equivalents.

One area where understanding and explicitly stating conceptual underpinnings of linguistic constructions is in the documentation and archiving process. On these websites, there is little mention of the documentation and archiving *process*, with the notable exception of FirstVoices. FirstVoices contains information and support for documentation and provides instructions not just for utilising the platform but also for documentation and archiving (including information on topics such as community consultation, recording audio and managing data, as well as providing links to webinars and in-person training). These websites are more oriented towards their users learning language using available materials, rather than documenting it.

In this website review, we can see some of the ways an explanation of words beyond a direct translation is provided. It is important that a language be understood as more than a set of words linked together, but as transmission of culture.

5.3.4 "We've always been protectors of our land and water" (June Johnson): Learning TEK is learning to understand the land and the language

This theme is about understanding individual and community relationships with the land, including how to treat it and how to interact with the land, and how this ties into ILR by supporting an understanding of relationality. This can mean learning about the interconnectedness of people and nature, and it can mean learning how to understand the land: how plants grow, how animals grow; how they interact with the local geography; how plants and animals reproduce; and more. The websites surveyed embodied this theme with content which describes how to interact with the land and how to understand it. For example, some sites included information such as proper protocol and information about plants, animals, as well as how to let respect and reciprocity guide one's relationships with the land.

Additionally, some websites included guiding information or best practices for interacting with the land in ways such as canoeing on the water, hunting, fishing, and harvesting plants. One example of this is on Cree Literacy.org, which has a video about making birch syrup. Another example is the interactive game on SENĆOŦEN FirstVoices featuring canoers paddling towards shore; the learner spells a word correctly or the canoers lose their paddles. This relates to understanding the land through language because the language may hold specific relations between the speaker and the land: for example, *ǰɛǰɛ* means both tree and cousin or relative in ʔayʔaǰuθəm. Attitudes toward understanding the land were shown in introductions which mentioned connections to and responsibility for the land or territory. Many websites included explanations about weather language. Skills such as canoeing, hunting, or harvesting means taking into consideration many different things, such as seasonal weather patterns, tide height,

currents, seasonal migrations and spawnings, and more. This means learning to understand the web of relations in nature which we are all a part of.

Some links featured on websites provided opportunities to get onto the land, such as land-based language camps and nature walks, like the in-person events offered on Kingston Indigenous Language website. Connection to the land and spirituality is often mentioned on these websites. Some included specific guidelines for how to interact with the land, such as how to follow proper protocol (as seen briefly above), which may involve expressions of gratitude, such as prayers in English or in nēhiyawēwin, and tobacco offerings. There may also be discussion about what it means to be a steward of land and territory and the responsibility of that position. How to treat the land respectfully is also often passed in stories, particularly in origin stories, which relay how people come from the land.

5.4 Specific examples

In order to provide a fuller picture of these websites, it is helpful to take a more in-depth look at specific websites. Below, we will look at one unique or exemplary website per language in order to make more of a profile and see how these specific sites may compare. After a broader look (above), there is value in being able to highlight and celebrate unique sites, as we now have wider context in which to situate them.

Kwak'wala: U'mista Potlatch (https://U'mistapotlatch.ca/enseignants-education/cours_4-lesson_4-eng.php)

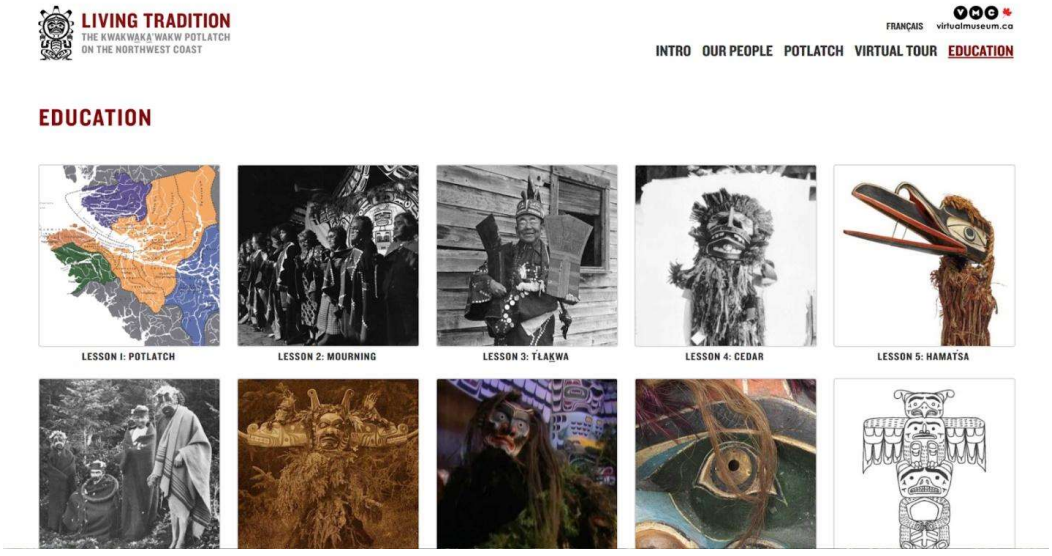
The U'mista Cultural Society is an organisation that "has worked towards fulfilling the mandate to ensure the survival of all aspects of cultural heritage of the Kwakwaka'wakw" (U'Mista Cultural Centre, 2024). Language is found in the online lesson plans for grades 4-5 which teach

about different aspects of potlatches. This includes videos, worksheets, and audio clips in Kwak'wala, with Kwak'wala and English subtitles. There are stories which include Sisiyutł, the 'Mitła, and the origin story of the 'namgis people. Songs include HAMSPEK TSAXAŁA, sung by Chief Bill Cranmer (audio and bilingual lyrics provided), and there is a lesson about the Hamat´sa dance. The U'mista Cultural Centre reminds us that

> The Kwakwaka'wakw have built a rich culture that reflects and acknowledges the riches in the natural environment. The songs, stories, dances and ceremonial objects honour the animals, rivers, cedar trees, salmon, and all those things that help to sustain the Kwakwaka'wakw physically and spiritually (2024).

A special part of this website is the virtual tour of the centre, which includes 6 panoramic scenes and high resolution images of the artefacts in the collections. There is also an interactive portion where one can click on and read descriptions of each artefact, which include masks, staffs, coppers, and carvings. Figure 5 is a screengrab showing some of the different lessons available on the website (U'mista Cultural Society, 2024).

Figure 5: U'mista Cultural Society screengrab

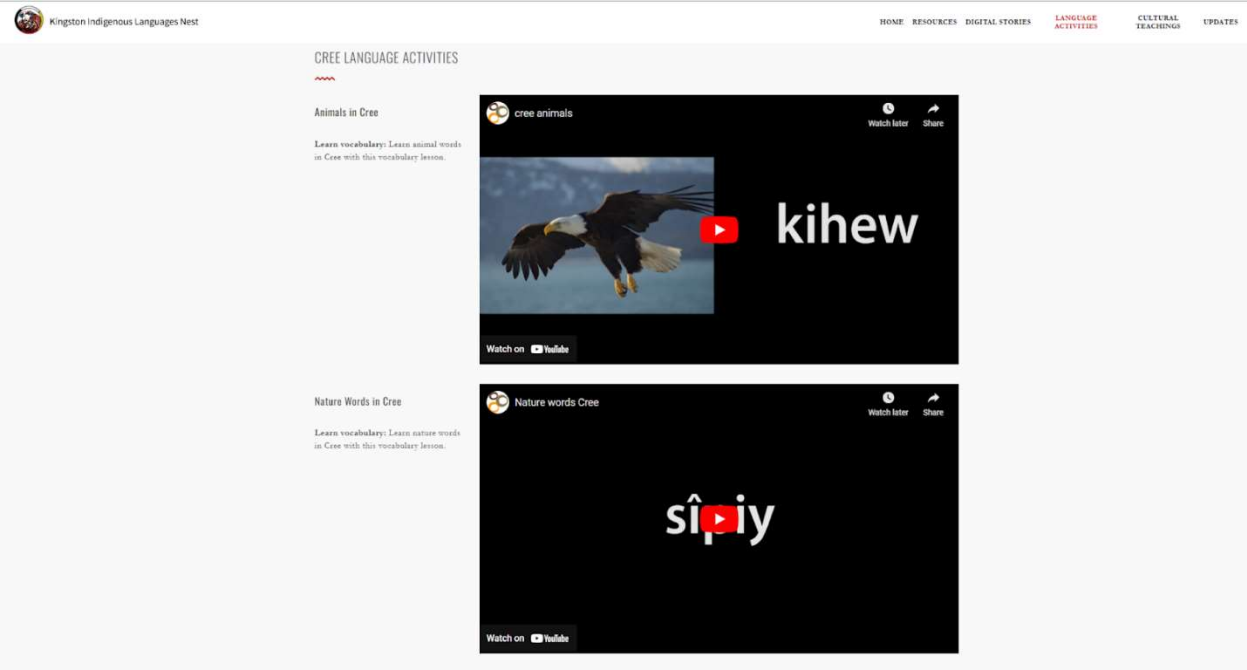


nēhiyawēwin: Kingston Indigenous Language Nest

(https://kingstonindigenouslanguage.ca/language-activities/cree-activities/)

Kingston Indigenous Language Nest is an organisation with the mission of promoting Algonquin languages Anishinaabe, Kanienke:ha, Mi'kmaq, Michif, and nēhiyawēwin, and "to champion the urban resurgence of Indigenous languages" (Kingston Indigenous Language Nest, 2019). This organisation works to provide language learning resources as well as in-person programs on the land. Users can find nēhiyawēwin in stories, videos, and teachings. Stories include personal narratives about their experiences learning their language and are fully in nēhiyawēwin with English subtitles or are all in English with some nēhiyawēwin. Videos include vocabulary for topics such as nature words, friendship words, animals, family words, emotion words, and more. There are links to events which are in person and on the land with other language learners and teachers. Figure 6 shows the vocabulary videos under Cree Language activities on the site.

Figure 6: Cree Language Activities (Kingston Indigenous Language Nest, 2019)

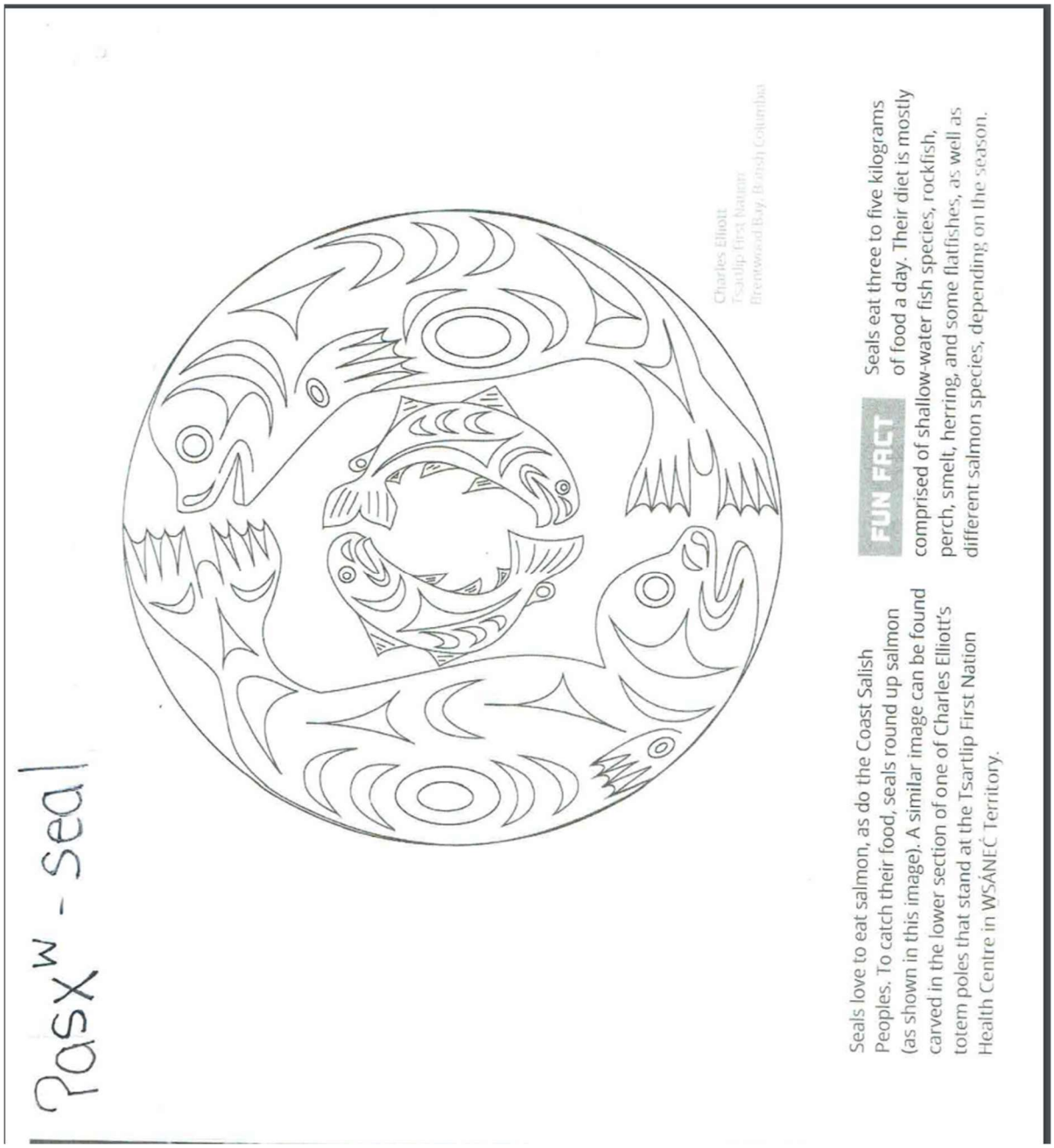


ʔayʔaǰuθəm: School District 47 Portal

(accessible at https://portal.sd47.bc.ca/group/h2t6q57/Documents/Know%20the%20Ocean%20.pdf).

The School District 47 Portal is the website platform for qathet School District 47, which is a school district which services qathet district 47 in Powell River. It is oriented towards learners who may still be in school and learning language in classes. This website includes ʔayʔaǰuθəm in stories (about winter, Mink and Granny, Mink and the Whale, Mink and Cloud, and more), videos (such as the legend of T'al song), and scavenger hunts (beach; spring; learn to interact and use language on land, connect outdoors). Worksheets are in pdf and .docx format with vocabulary and accompanying assignments. Something special about this website is its beautiful colouring pages accompanying lessons like vocabulary animal vocabulary. Figure 7 shows the artwork in one of the activity books which comes with vocabulary and information.

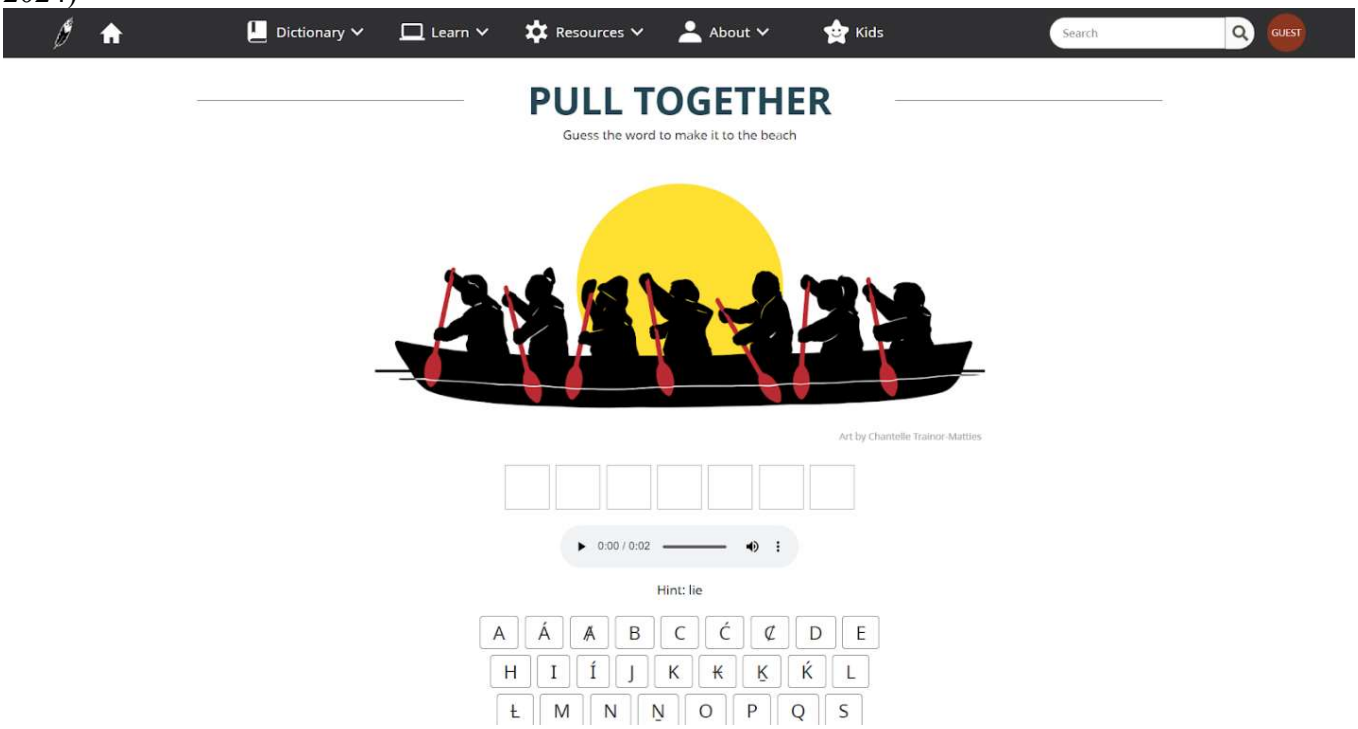
Figure 7: ʔayʔaǰuθəm colouring page screengrab (qathet school district 47, n.d.)



SENĆOŦEN: FirstVoices SENĆOŦEN

The FirstVoices portal for SENĆOŦEN contains a dictionary which is searchable by words, phrases, alphabetical order, and category. It also features stories (TŦE SĆELÁNEN̲ ET̲ W̲SÁNEĆ or The Saanich Moons by Earl Claxton YELḴÁTŦE and John Elliott STOLC̓EŁ, XEN̲ SEN I SENĆOŦEN or I can Speak SENĆOŦEN, and ŁÁUWELN̲EW̲ by Earl Claxton YELḴÁTŦE and John Elliott STOLC̓EŁ). Additionally, the website features interactive games (Pull Together (see Figure 8, below), Phrase scrambler, and Wordsy) for learners to use. This site is oriented towards learners of all levels. Words and phrases are accompanied by audio recordings. There are specific categories for trees, bark, roots; weather words and phrases; as well as nature/environment. FirstVoices (discussed more in-depth in section 5.1.1) is created by First Peoples' Cultural Council and provides a platform to support communities' languages. It is a major platform which offers interactive and easy-to-use features, as well as holding a significant amount of language documentation and archives. Figure 8 shows the Pull Together word game, where players can guess the word to make the paddlers pull. When the full word is spelled correctly, all paddlers pull together and players make it to the beach.

Figure 8: Pull Together SENĆOŦEN FirstVoices Screengrab (First Peoples' Cultural Council, 2024)



5.5 Conclusion

As we have seen, there are many parts to this diverse collection of websites. The breadth of this collection allows us to inspect many different websites, while continuing to answer the original research questions. We learned that these websites fulfilled the themes put forward in Chapter 4: Teachings from the Experts. Community websites continue to expand on the same themes, offering an interesting look into the intersection of TEK and ILR online.

The first question was, how do people include TEK in their language revitalization work? From the interviews, we learned that TEK influences both methods and content of language learning and revitalization. In these websites, we see similar trends, such as word lists or videos explaining TEK in the language (such as the Making Pemmican video on Kingston Indigenous

Language.net). Additionally, several websites had stories in the language which included TEK, such as origin stories which tie speakers to the land. These websites also demonstrated methods of tying instruction to place even online, with animal or plant names as well as demonstrations of TEK.

The second question was, what are some of the effects of including TEK in Indigenous language revitalization work? Like in the interviews, we see websites also convey a sense of identity from TEK and language. As mentioned previously, like the PEPAKE̲N HÁUTW̲ website, supporting an understanding of the land and our relation to it are explicitly stated. In addition to what was shared in the interviews, on the websites one can see examples how TEK is included in ILR materials, such as on worksheet PDF links on the Portal 47 website.

The final question was, what about TEK is important to language revitalization? Part of TEK is a moral foundation for how to live in a good way, how to engage in a reciprocal relationship with the land, how to steward and care for the land, and spiritual connections to language and land. On some websites, this was explicitly stated. Additionally, several websites included mention of how important connection to language and traditional ways of being and doing are. With this website survey, we can see how this new information complements the interviews and reveals new information.

The structure of the web survey was borrowed from Parker (2012) which provided a helpful starting point; while the web survey wasn't used for the same purpose, it was immensely helpful to have this previous example and inspiration, as I haven't seen many other web surveys in other studies. Having this inspiration was crucial, as well, as it provided an efficient way to learn more specifics about how people include TEK in ILR. It was a helpful supplement to a

formal, academic literature review and provided needed context for the interviews. Focusing the survey on specific languages was also helpful as a necessary limitation of size to be able to provide better comparisons. Even in this virtual setting, connection to the land is inseparable from language. TEK, a way of interacting with the land, is an important part of ILR. This survey has also served to show the hard work, determination, and skill that went into connecting communities in new ways and in ILR as a whole; it reinforced the importance of each language and the dedication which so many people have to learning and providing access to them.

6. Weaving it all together: Conclusion

6.1 Discussion

Indigenous languages come from the land. TEK is a way of interacting with the land using hands, bodies, minds, and hearts. This study sought to answer the questions: how do people include TEK in their language revitalization work? What are the effects of including TEK in revitalization work? What about TEK is important to language revitalization? We have seen how Traditional Ecological Knowledge is intertwined with and supports Indigenous language revitalization in many ways. In this thesis, the data supports that ILR and TEK are interconnected in many ways, including in language lessons (both method and content), in understanding worldviews which provide conceptual foundations in language, in language reclamation, and in understanding the land. This is supported through inspection of the literature as well as the shared knowledge and experience by Indigenous experts. The data supports these conclusions by way of these themes which are presented in Chapter 4: Teachings from the Experts.

The first research question which this thesis sought to answer was, how do people include TEK in their language revitalization work? We have seen that TEK is included in both methods of ILR (such as hands-on and place-based learning, and learning on the land) as well as the content (learning new domains of knowledge). TEK and ILR both can reinforce pride and a sense of identity, which is important to language reclamation (Leonard, 2012).

The second research question was, what are some of the effects of including TEK in Indigenous language revitalization work? Including TEK in ILR helps teach Indigenous ways of being and doing; it helps make strides forward in language reclamation; it helps learners gain a deeper understanding of worldviews carried in the language, and it helps learners gain

understanding about how to understand the land, their relationship with it, and how language carries that relationality.

The final question was, what about TEK is important to language revitalization? TEK and ILR are inseparably intertwined: from learning domains of knowledge, to stories, to learning worldview and how to work with the land in a good way, to placenames, TEK and language walk hand in hand. This supports ILR as learning TEK helps language learners gain a deeper understanding of their language, broadens the domains in which language is spoken, and encourages pride in both language and traditional skills. Together, the message of this thesis is about how important it is to consider TEK and connection to the land when revitalising Indigenous languages.

Four themes were produced through analysis of the interviews: The first theme discusses TEK in language classes, the skills which are learnable from TEK, and the methods which learning TEK brings with it. The second theme discussed the impact of language reclamation and decolonizing instruction, as well as how language learners learning about their identity can support language revitalization and reclamation. The third theme discusses learning about the concepts behind the words, or how worldview shown in language can be learned through TEK, with specific examples of toponymy. The fourth theme exhibits how learning TEK can lead to a better understanding of the land and relationality.

After the introduction in Chapter 1, Chapter 2 presented a review of the literature which also served to lay a contextualising background for the interviews. This literature review was retroactively framed by themes developed by analysis of interviews. This chapter was important in revealing some of the major literature in this field. It also provided background and context for the interview section.

Chapter 3 presented the methods section which discussed how the research was approached and structured using Constructivist Grounded Theory, an emergent form of qualitative data analysis, in order to privilege and centre the interviews with five Indigenous experts who are involved in ILR or TEK as well as follow guiding principles of Indigenist research. This section explained the motivations behind the structure of the thesis. It also explained the layout of the literature review and motivations behind the resource section.

Chapter 4 presented the insights from the interviews with the experts' words and their common themes. The experts shared experience and wisdom gathered over many years which provided a deep, rich look into their language revitalization and TEK teaching. This chapter was vitally important to the rest of this thesis as it provided foundational material. Appendix A presented a short resource for those involved with revitalising their language or TEK. This resource was intended to either provide a starting place for looking at TEK in ILR or to suggest possible ideas for possible methods and content. It followed the same four themes as the literature review and the interview section. This resource also presented additional website resources for further reading or help. It was very important to include this resource as not only does it distil the information shared in the interviews, it also is a way to return some of this knowledge and to reciprocate the generosity of the experts in sharing their time and wisdom. This resource hopefully provides a useful and relevant aid.

Chapter 5 presents a review of ILR websites and a breakdown of how TEK is included online which provides a look at TEK in ILR outside of published sources, as well as a look at how the themes developed in the interviews are fulfilled online.

We have seen that TEK is important in language instruction, offering methodologies, connection to identity, to place, and to history and family. TEK and ILR both are communally

supported knowledge systems; learning one can elucidate the other. Including TEK in language lessons can help provide cultural context and understanding of worldviews which the language imparts, which supports language revitalization and reclamation movements by supporting deeper language understanding. TEK also supports ILR by maintaining the domains in which language is currently or was traditionally spoken. TEK and ILR are interwoven; this intersection imparts understanding of the land and language both.

With these conclusions, this thesis adds to work already written about TEK and ILR. It underscores the deep connection between land and language which is discussed in many other works. This thesis took Parker (2012) as a guide, and while similarities abound, there are also several key differences. To begin with, this thesis looked specifically at Traditional Ecological Knowledge, while Parker (2012) looked at learning on the land. Additionally, this thesis comes twelve years after the publication of Parker (2012), and so had an additional twelve years of publications, progress, and change to draw upon. Particularly the field of language revitalization has seen an increase in publications and awareness over the years; however, there is much room for growth in understanding the connections between TEK and ILR. Finally, the experts interviewed in Parker (2012) and this thesis were different people, with the exception of Earl Claxton, Jr., bringing different perspectives and experiences to this work. As a result of these foundational differences, this study has brought to light themes and findings which are distinct from Parker (2012). Many similarities are shown, however: for example, identity and knowing the land are both prominent.

The importance of this research comes from the wisdom which was shared by the experts. The work which they have done and continue to do is vital to the communities they serve. This thesis explores themes which tie together research questions with their answers.

These have not provided clear-cut and easy answers (nor clear-cut boundaries between themes), and that, too, is part of the importance of this research: in providing a look into this connection, we have seen that these themes all support the others. If there is one message to take from this research it is the interwoven-ness of everything we have looked at: from TEK and ILR to how they support each other, and how in each theme one may find the others.

6.2 Challenges

There were several challenges in this work. One of the challenges of this research was identifying and avoiding implicit bias in my work as well as keeping myself accountable and keeping communication clear and concise. Responsibility is on me to be prepared and a clear communicator. One helpful strategy was having a sort of pre-interview to talk about things and get comfortable with each other; this led to a more relaxed interview and a better knowledge of and relationship with the expert.

6.3 Implications and Future Research

One of the implications or messages that has come out of this research is that there needs to be more TEK and Indigenous methods used and accepted in western institutions. They are ways of approaching the world which need to be acknowledged and have their respected places if reconciliation is to be more than a gesture or placation. Indigenous knowledge needs to be privileged in many spheres. New questions are brought to light: if TEK and Indigenous languages are to be better incorporated and acknowledged in western institutions, how best would this happen? How would that be well-supported? What sort of infrastructure needs to be in place? Reconciliation has laid the groundwork of raising awareness of ILR, though there is

still progress to be made. How does reconciliation support efforts to use, teach, share, and deepen knowledge of TEK and Indigenous languages in communities?

While this research addresses many topics, many can be explored in more depth by themselves or with others. For example, focusing on language documentation or other questions such as how TEK is changing these days with climate change would each provide a research question worthy of their own theses. There are many different and equally important directions to steer one's research. Hopefully this presents a helpful resource to those who will read it.

6.4 Limitations

In this thesis we have seen how much work can be done, but we have discussed very little what *cannot* be done. There are certainly limits upon this research. Firstly, there is the fact that this project attempts to answer broad questions, as it is exploring a gap in existing research. This means that it is harder to explore these topics as deeply as other, narrower topics. However, the research questions are broad with the intent of stimulating further discussion and investigation, rather than claiming that these questions have been answered completely and totally within a single work: there are many parts which could be focused on singly, rather than together. I choose to remain positive about this, and simply say: future research possibilities are introduced. There are time constraints built into this project, as well; the largest being, perhaps, that this project is a Master's thesis and not a PhD dissertation: this research must be completed in the better part of a year, instead of several. This is a topic which a person could easily spend years investigating. Added to this, I am only one person, with finite time and energy. Additionally, there are the limits of my own knowledge and perspective. I am approaching this work with a Western background; unconsciously, I may interpret information within these confines: "our

imaginative renderings of what we see and learn are interpretations, emanating from dialectics of thought and experience…we are *part* of our constructed theory and this theory reflects the vantage points inherent in our varied experiences, whether or not we are aware of them" (Charmaz, 2006, p. 149). Finally, this thesis cannot speak to all Indigenous peoples and all ILR, as TEK is necessarily a knowledge of local animals, plants, earth, and water; this section cannot apply to all situations or peoples as "the languages, stories, and practices that differentiate one group from another are place-specific critical features that regenerate entire systems of knowledge" (Armstrong, 2018, p. 105). As TEK is supported by long interaction with a local landscape and environment which are as diverse as languages and cultures which they support, it is impossible to say that this research will be as relevant to everyone as it is to others; however, it still represents valuable work.

6.5 Benefits

This work has the potential to bring several benefits. The literature review provides a starting base for those interested in researching the topic, and the interviews provide a perspective from those who are involved in the work themselves. Hopefully, this research will provide a starting place for people who a) wish to know more about using TEK in language revitalization or b) people who are already involved in the movement, but who may want to know more about other global perspectives. This research is also important to the field of ILR as it adds to the research about including TEK in ILR. This thesis also underscores the validity of TEK and supports learning on the land. Finally, the resource will hopefully be able to communicate these principles in short, accessible ways, as it can be printed or shared electronically. The inclusion of interviews with experts brings additional insight, including a greater depth of knowledge, experience, and perspective to this work. Hopefully, this project will

inspire others to find new ways to connect with their language(s) and the world around them, supporting themselves and their communities.

References

Amery, R. (2016). *Warraparna Kaurna! Reclaiming an Australian language*. University of Adelaide Press.

Andre, A. M. T. (2006). *Nan t'aih nakwits'inatsìh (The land gives us strength): the medicine plants used by the Gwich'in people of Canada's Western Arctic to maintain good health and well-being*. (Master's Thesis, University of Victoria).

Archibald, J. A. (2008). *Indigenous storywork: Educating the heart, mind, body, and spirit*. UBC press.

Arctic Eider Society. (n.d.). *Ice watch*. SIKU. https://about.siku.org/icewatch/

Arka, I. W. & La Hisa, A. M. (2017). *The ethnobotanical-linguistic documentation of Sago: a preliminary report from Merauke*. Linguistik Indonesia, 35.

Armstrong, J. C. (2009). *Constructing indigeneity: Syilx Okanagan oraliture and tmixwcentrism.* (Doctoral dissertation, Universität Greifswald).

Armstrong, J. (2016). Land speaking. *Introduction to Indigenous literary criticism in Canada*, 145-59. Broadview Press.

Armstrong, J. (2018). A single strand: the Nsyilxcin speaking people's Tmixw knowledge as a model for sustaining a life-force place. In M.K. Nelson, & D. Schilling (Eds.), *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability*, 10. Cambridge University Press.

Blackstone, P. (2019). *An investigation of pedagogical approaches and methods used in a French university French-as-a-foreign-language program: teacher and student perspectives* (Master's Thesis, University of Victoria).

Battiste, M. (2009). Naturalizing Indigenous knowledge in Eurocentric education. *Canadian Journal of Native Education*, *32*(1), 5-18.

Battiste, M., & Henderson, J. S. Y. (2000). *Protecting Indigenous knowledge and heritage*. University of Chicago Press.

Basso, K. H. (1996). *Wisdom sits in places: Landscape and language among the Western Apache*. University of New Mexico Press.

Blaney, D. personal communication, April 14, 2023.

Boney Jr, R., Caña, V., Crawler, D., Fitzgerald, C., & Ross, J. J. (2015). *Designing pedagogy from Cherokee language and ecological documentation.* Presented at 4th International Conference on Language Documentation and Conservation (ICLDC). http://hdl.handle.net/10125/25347

Boas, F. (1932). The aims of anthropological research. *Science*, *76*(1,983), 605-613.

Brinklow, N. T., Littell, P., Lothian, D., Pine, A., & Souter, H. (2019). Indigenous language technologies and language reclamation in Canada. In *Collection of research papers of the 1st international conference on language technologies for all,* (pp. 402-406).

Bryant, A., & Charmaz, K. (2007). *The SAGE Handbook of Grounded Theory*. SAGE Publications Ltd, https://dx.doi.org/10.4135/9781848607941

Cajete, G. (1994). *Look to the mountain: An ecology of indigenous education*. Kivaki Press.

Cajete, G. (2018). Native science and sustaining Indigenous communities. In M. Nelson & D. Shilling (Eds.), *Traditional Ecological Knowledge: learning from Indigenous practices for environmental sustainability* (New Directions in Sustainability and Society, pp. 15-26). Cambridge University Press. doi:10.1017/9781108552998.003

Castonguay, R. (2010). The relevance of native toponymy in illustrating land occupancy in the Canadian north. *Onomastica* 56, 1-12.

Charmaz, K. (2003). Grounded theory: objectivist and constructivist methods. In Denzin, O., & Lincoln, Y. (Eds.), *Strategies of Qualitative Inquiry (*pp. 249-291). Sage Publications.

Charmaz, K. (2006). *Constructing grounded theory: a practical guide through qualitative analysis.* Sage Publications.

Charmaz, K. (2014). Constructing grounded theory (introducing qualitative methods series), *2.* Sage Publications.

Chew, K. A., Nicholas, S. E., Galla, C. K., Kawai'ae'a, K., Leonard, W. Y., & de Lima Silva, W. (2021). Storying an interconnected web of relationships in Indigenous language reclamation work and scholarship. *WINHEC: International Journal of Indigenous Education Scholarship*, (1), 334-375.

Chiblow, S., & Meighan, P. J. (2021). Language is land, land is language: The importance of Indigenous languages. *Human Geography*, *15*(2), 206-210.

Claxton, E., personal communication, June 29, 2023.

čuucqa Rorick, L. (2016). *wałyaʔasukʔi naatnaniqsakqin: at the home of our ancestors: Hesquiaht second language immersion on Hesquiaht land*. (Master's project, University of Victoria).

Czaykowska-Higgins, E. (2009). Research models, community engagement, and linguistic fieldwork: Reflections on working within Canadian Indigenous communities. Language documentation and conservation, *3(1)*.

Daniels, B. C. (2021). *ē kakwē nēhiyaw pimātisiyān ōta nīkihk: THE LIFELONG JOURNEY HOME* (Doctoral dissertation, University of Saskatchewan).

Daniels, B. personal communication, February 15, 2023 (p.c., February 15, 2023)

Eberhard, D.M., Simons, G., & Fennig, C. (eds.). (2022). *Ethnologue: Languages of the World.* Summer Institute of Language.

Engman, M. M., & Hermes, M. (2021). Land as Interlocutor: A Study of Ojibwe Learner Language in Interaction on and With Naturally Occurring 'Materials'. *The Modern Language Journal*, *105*(S1), 86-105.

Ermine, W. (2007). The ethical space of engagement. *Indigenous Law Journal*, *6*(1), pp. 193-201.

Ferguson, J., & Weaselboy, M. (2020). Indigenous sustainable relations: Considering land in language and language in land. *Current Opinion in Environmental Sustainability*, *43*, 1-7.

Fetterman, D. M. (2019). *Ethnography: Step-by-step*. Sage publications.

Fill, A., & Mühlhäusler, P. (Eds.). (2006). *Ecolinguistics reader: Language, ecology and environment*. A&C Black.

First Nations Information Governance Center (2014). Ownership, Control, Access, Possession (OCAP™): the path to First Nations information governance. Retrieved October 10, 2022 from: https://fnigc.ca/wp-content/uploads/2020/09/5776c4ee9387f966e6771aa93a04f389_ocap_path_to_fn_information_governance_en_final.pdf

FirstVoices. (2024). *FirstVoices.com*. First Peoples' Cultural Council. https://www.firstvoices.com/

Fishman, J. A. (1991). *Reversing language shift: Theoretical and empirical foundations of assistance to threatened languages* (Vol. 76). Multilingual matters.

Galla, C. K. (2018). Digital realities of Indigenous language revitalization: A look at Hawaiian language technology in the modern world. *Language and Literacy*, *20*(3), 100-120.

Galla, C. K., & Goodwill, A. (2017). Talking story with vital voices: Making knowledge with indigenous language. *Journal of Indigenous Wellbeing*, *2*(3), 67-75.

Gardner, S. E. B. (2012). The four Rs of leadership in Indigenous language revitalization. *Living Indigenous leadership: Native narratives on building strong communities*, 125-135.

Gessner, S., Herbert, T., & Parker, A. (2022). *Report on the status of British Columbia First Nations languages*. First Peoples' Cultural Council.

Gonella, M. P., Baldwin, D. W., & Greenberg, A. M. (2015). Community-led ethnobotanical triage: Case study—Myaamia corn traditions. *Ethnobotany Research and Applications*, *14*, 517-531.

Government of Canada, Interagency Advisory Panel on Research Ethics. (2022). *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2 (2022)*. https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2022.html

Government of Canada. (2019). *Tri-Council Policy Statement Chapter 9: Research involving the First Nations, Inuit and Metis Peoples of Canada*. Retrieved from https://ethics.gc.ca/eng/tcps2-eptc2_2018_chapter9-chapitre9.html.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, *24*(2), 105-112.

Grenoble, L. A., McMahan, H., & Petrussen, A. K. (2019). An ontology of landscape and seascape in Greenland: The linguistic encoding of land in Kalaallisut. *International Journal of American Linguistics*, *85*(1), 1-43.

Grenoble, L. A., & Whaley, L. J. (2005). *Saving languages: An introduction to language revitalization*. Cambridge University Press.

Grimes, M. K. (2011). *On shifting roles and responsibilities in Canadian indigenous Community-Based Language Research* (Master's thesis, University of Victoria).

Hall, J. (2021). Indigenous Methodologies in Linguistics: A Case Study of Nuu-wee-ya' Language Revitalization. Retrieved from https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/26876/Hall_oregon_0171A_13133.pdf?sequence=1&isAllowed=y

Harrison, D. (2007). *When languages die: the extinction of the world's languages and the erosion of human knowledge*. Oxford University Press.

Hart, M. A. (2010). Indigenous worldviews, knowledge, and research: The development of an Indigenous research paradigm. *Journal of Indigenous Social Development*, *1*(1A).

Hart, M. A., Straka, S., & Rowe, G. (2017). Working across contexts: Practical considerations of doing Indigenist/anti-colonial research. *Qualitative Inquiry*, *23*(5), 332-342.

Heikkilä, K., & Fondahl, G. (2010). Indigenous toponyms as pedagogical tools: reflections from research with Tl'azt'en Nation, British Columbia. *Fennia-International Journal of Geography*, *188*(1), 105-122.

Henne-Ochoa, R., Elliott-Groves, E., Meek, B. A., & Rogoff, B. (2020). Pathways forward for Indigenous language reclamation: Engaging Indigenous epistemology and learning by observing and pitching in to family and community endeavors. *The Modern Language Journal*, *104*(2), 481-493.

Hermes, M., Bang, M., & Marin, A. (2012). Designing Indigenous language revitalization. *Harvard Educational Review*, *82*(3), 381-402.

Hermes, M. (2012). Indigenous language revitalization and documentation in the United States: Collaboration despite colonialism. *Language and Linguistics Compass*, *6*(3), 131-142.

Hermes, M. R., Engman, M. M., Meixi, & McKenzie, J. (2021). Relationality and Ojibwemowin in Forest Walks: Learning from Multimodal Interaction about Land and Language. *Cognition and Instruction*, 1-31.

Hinton, L., & Hale, K. (2001). *The green book of language revitalization in practice*. Academic Press.

Hinton, L., Huss, L. M., & Roche, G. (Eds.). (2018). *The Routledge handbook of language revitalization*. Routledge.

Holton, G. (2012). *Language archives: They're not just for linguists anymore*. In Seifart, F., Haig, G., Himmelmann, N. P., Jung, D., Margetts, A., & Paul Trilsbeek, P. (*Eds.*), Language Documentation & Conservation Special Publication: Potentials of Language Documentation: Methods, Analyses, and Utilization, *3*, pp. 105–110 University of Hawai'i Press.

Holton, G. (2018). Interdisciplinary language documentation. In *The Oxford Handbook of Endangered Languages*. Oxford University Press.

Huang, L. S. (2019). *Analysing open-ended survey questions and semi-structured interviews on language-learning needs of Syrian refugees*. SAGE Publications Limited.

Huijsmans, M. (2023). ʔayʔaǰuθəm lexical categories. In Papers for the International Conference on Salish and Neighbouring Languages, *58*. *University of British Columbia Working Papers in Linguistics*.

Hunn, E. (1993). What is traditional ecological knowledge? In Williams, N., & Baines, G., (Eds.), *Traditional ecological knowledge: Wisdom for sustainable development.* Australian National University, 13-15.

Hyndman, D. (1994). Conservation through self-determination: promoting the interdependence of cultural and biological diversity. *Human Organization*, *53*(3), 296-302.

Isaac, I. (2010). *Understanding traditional ecological knowledge through Kwakwaka'wakw story*. (MA Thesis). University of Victoria.

Jernigan, K. (2012). Plants with histories: the changing ethnobotany of Iquito speakers of the Peruvian Amazon. *Economic Botany*, *66*(1), 46-59.

Johnson, J. personal communication, June 9, 2023 (p.c., June 9, 2023)

Kimmerer, R. (2011). Restoration and reciprocity: the contributions of traditional ecological knowledge. *Human dimensions of ecological restoration* (pp. 257-276). Island Press.

Kimmerer, R. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed editions.

Kimmerer, R. (2018). Mishkos Kenomagwen, the lessons of grass: restoring reciprocity with the good green earth. In M. Nelson & D. Shilling (Eds.), *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability* (New

Directions in Sustainability and Society, pp. 27-56). Cambridge University Press. doi:10.1017/9781108552998.004

Kirkness, V. J., & Barnhardt, R. (1991). First Nations and higher education: The four R's—respect, relevance, reciprocity, responsibility. *Journal of American Indian Education*.

Kovach, M. (2009). *Indigenous methodologies: characteristics, conversations, and contexts.* University of Toronto Press.

Kovach, M. (2010). Conversation method in Indigenous research. *First peoples child & family review, 5*(1), 40-48.

Kovach, M. (2021). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto Press.

Kwakiutl Band Council. (2018). *Our culture*. https://www.kwakiutl.bc.ca/our-culture

La Hisa, A. M., & Arka, I. W. (2017). The ethnobotanical-linguistic documentation of Sago: a preliminary report from Merauke.

Leonard, W. (2012). Challenging "extinction" through modern Miami language practices. *American Indian Culture and Research Journal*, *35*(2). University of California, Los Angeles Press.

Leonard, W. Y. (2017). Producing language reclamation by decolonising 'language'. *Language Documentation and Description,* 14, 15-36. EL Publishing. doi: https://doi.org/10.25894/ldd146

Leonard, W. (2018). Reflections on (de)colonialism in language reclamation. In McDonnell, B., Berez-Kroeker, A.L., & Gary Holton (Eds.), *Language Documentation & Conservation Special Publication No. 15: Reflections on Language Documentation 20 Years after Himmelmann 1998*. University of Hawai'i Press.

Leonard, W. 2020. Musings on Native American language reclamation and sociolinguistics. *International Journal on the Sociology of Language*. De Gruyter Mouton.

Linklater-Wong, P. (2018). *Nohcimihk"-on the land": a study of traditional harvesting practices and their effects on the perceived mental health of Indigenous youth in the James Bay area* (Doctoral dissertation, University of Toronto).

Linneberg, M. S., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative research journal*, *19*(3), 259-270. Retrieved from https://pure.au.dk/ws/files/190067680/Linneberg_2019_Coding_qualitative_data.pdf

Littell, P., Kazantseva, A., Kuhn, R., Pine, A., Arppe, A., Cox, C., & Junker, M. O. (2018). Indigenous language technologies in Canada: Assessment, challenges, and successes. In *Proceedings of the 27th International Conference on Computational Linguistics* (pp. 2620-2632).

Lyall, A., Nelson, H., Rosenblum, D., & Turin, M. (2019). K̓a̱k̓otła̱tła̱no'x̱w x̱a k̓wak̓wax̱'mas: Documenting and reclaiming plant names and words in Kwak̓'wala on Canada's west coast. https://go.gale.com/ps/i.do?id=GALE%7CA651276070&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=19345275&p=AONE&sw=w&userGroupName=anon%7Ea8272579.

Mackey, W. F. (2001). The ecology of language shift. *The ecolinguistics reader: Language, ecology, and environment*. Continuum Publishing.

Martin, K., & Mirraboopa, B. (2003). Ways of knowing, being and doing: A theoretical framework and methods for indigenous and indigenist research. *Journal of Australian studies*, *27*(76), 203-214.

McCarter, J., M. C. Gavin, S. Baereleo, and M. Love. 2014. The challenges of maintaining indigenous ecological knowledge. Ecology and Society 19(3), 39. http://dx.doi.org/10.5751/ES-06741-190339

McCarty, T. L. (2018). Community-based language planning: Perspectives from indigenous language revitalization. In Hinton, L., Huss, L., & Roche, G., (*Eds*.), *the Routledge handbook of language revitalization* (pp. 22-35). Routledge.

McCarty, T. L., Nicholas, S. E., Chew, K. A., Diaz, N. G., Leonard, W. Y., & White, L. (2018). Hear our languages, hear our voices: Storywork as theory and praxis in indigenous-language reclamation. *Daedalus*, *147*(2), 160-172.

McGregor, J. (2018). Toward a Philosophical Understanding of TEK and Ecofeminism. In M. Nelson & D. Shilling (Eds.), *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability* (New Directions in Sustainability and Society, pp. 109-128). Cambridge University Press. doi:10.1017/9781108552998.008

McIvor, O. (2020). Indigenous language revitalization and applied linguistics: Parallel histories, shared futures? *Annual Review of Applied Linguistics*, *40*, 78-96.

Meighan, P. J. (2021). Decolonizing the digital landscape: The role of technology in Indigenous language revitalization. *AlterNative: An International Journal of Indigenous Peoples*, *17*(3), 397-405. Retrieved from https://journals.sagepub.com/doi/pdf/10.1177/11771801211037672.

Meighan, P. J. (2022). Indigenous language revitalization using TEK-nology: how can traditional ecological knowledge (TEK) and technology support intergenerational language transmission? *Journal of Multilingual and Multicultural Development*, 1-19.

Melzer, A. M. (2014). *Language Reclamation, Food Systems, and Ethnoecological Revitalization: A Case Study on Myaamiaki Ethnobotany and Community-Based Participatory Research* (Masters thesis, University of Cincinnati).

Montler, T. (2023). *SENĆOŦEN: A Grammar of the Saanich Language.* https://scalar.usc.edu/works/sencoten/the-place-of-senoen-in-the-salishan-language-family?path=part-1--introduction

Mowatt, M., de Finney, S., Wright Cardinal, S., Mowatt, G., Tenning, J., Haiyupis, P., & Claxton, N. X. (2020). ȻENTOL TŦE TEN̲EW̲ (together with the land): Part 1: Indigenous land-and water-based pedagogies. *International Journal of Child, Youth and Family Studies*, *11*(3), 12-33.

Mukurtu CMS: An Indigenous Archive and Publishing Tool. Humanities for All. (n.d.). https://humanitiesforall.org/projects/mukurtu-an-indigenous-archive-and-publishing-tool. Retrieved March 23, 2024

Mulrennan, M. E., & Bussières, V. (2020). Indigenous environmental stewardship: do mechanisms of biodiversity conservation align with or undermine it? Turner, N. J. (Ed.). *Plants, people, and places: the roles of ethnobotany and ethnoecology in Indigenous peoples' land rights in Canada and beyond 96, pp.* 282-312. *McGill-Queen's Press.*

Nash, J. (2011). *Insular toponymies: pristine place-naming on Norfolk Island, South Pacific and Dudley Peninsula, Kangaroo Island, South Australia* (Doctoral dissertation, University of Adelaide).

Nazarea, V. D. (Ed.). (1999). *Ethnoecology: situated knowledge/located lives*. University of Arizona Press.

Native-Land.ca. (2019). *Kwak̓wala*. Native-Land.ca. https://native land.ca/maps/languages/kwakwala/

Native-Land.ca. (2021). *nēhiyawēwin (Plains Cree).* Native-Land.ca. https://native-land.ca/maps/languages/plains-cree-2/

Native-Land.ca. (2022). *ʔayʔaǰuθəm / éy7á7juuthem.* Native-Land.ca. https://native-land.ca/maps/languages/ey7a7juuthem/

Native-Land.ca. (2020). *SENĆOŦEN / Malchosen / Lkwungen / Semiahmoo / T'Sou-ke.* Native-Land.ca. https://native-land.ca/maps/languages/sencoten-malchosen-lkwungen-semiahmoo-tsou-ke/

Nelson, M., & Vucetich, J. (2018). Wolves and ravens, science and ethics: traditional ecological knowledge meets long-term ecological research. In M. Nelson & D. Shilling (Eds.), *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability* (New Directions in Sustainability and Society, pp. 129-136). Cambridge University Press. doi:10.1017/9781108552998.009

Nettle, D., & Romaine, S. (2000). *Vanishing voices: the extinction of the world's languages*. Oxford University Press.

Nicholson, M. (2013). *The Body the House, and the Land: the conceptualization of space in the Kwakwaka'wakw language and culture*. (Doctoral Dissertation, University of Victoria).

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and behavior*, *41*(5), 715-740.

Nyindem, S. N. N. (2019). Ethnobotany and language revitalisation: the case of plants in Isubu of Cameroon. *Journal of Literature, Languages and Linguistics*, *62*, 39-49.

Odango, E. L. (2016). A discourse-based approach to the language documentation of local ecological knowledge. *Language documentation and conservation* (10), pp. 107-154.

Ortiz, S. (2018). Indigenous sustainability: language, community wholeness, and solidarity. In M. Nelson & D. Shilling (Eds.), *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability* (New Directions in Sustainability and Society, pp. 85-94). Cambridge University Press. doi:10.1017/9781108552998.006

Parker, A. (2012). *Learning the language of the land*. (Master's thesis, University of Victoria).

Pojar, J., MacKinnon, A., Card, G., Foraging, P. N. (1994). *Plants of the pacific northwest.* Lone Pine Publishing.

Purdue University. (n.d.). *Writing a literature review*. Writing a Literature Review. https://owl.purdue.edu/owl/research_and_citation/conducting_research/writing_a_literature_review.html

Rampton, B., Maybin, J., & Roberts, C. (2015). Theory and method in linguistic ethnography. *Linguistic ethnography: Interdisciplinary explorations*, 14-50.

Requesens-Galnares, A. & United Nations Department of Economic and Social Affairs. (2023). Policy Brief Number 151. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB151.pdf

Saldaña, J. (2013). *The coding manual for qualitative researchers.* Sage Publications.

Si, A. (2011). Biology in language documentation. *Language documentation & conservation*, *5*, 169-186.

Simpson, L. B. (2014). Land as pedagogy: Nishnaabeg intelligence and rebellious transformation. *Decolonization: indigeneity, education & society*, *3*(3), pp. 1-25.

Skutnabb-Kangas, T. (2009). The stakes: Linguistic diversity, linguistic human rights and mother-tongue-based multilingual education-or linguistic genocide, crimes against humanity and an even faster destruction of biodiversity and our planet. In *Bamako International Forum on Multilingualism,* pp. 19-21.

Smith, L. T. (2019). Decolonizing research: Indigenous storywork as methodology. Bloomsbury Publishing.

Sugiyama, M. S., Mendoza, M., & Quiroz, I. (2020). Ethnobotanical knowledge encoded in Weenhayek oral tradition. *Journal of Ethnobiology*, *40*(1), 39-55.

Sutton, P. (1980). Linguistic aspects of ethnobotanical research. In *Papers in Australian Linguistics No. 13: Contributions to Australian Linguistics*. Australian National University.

Taylor, D.H. (2004). The voice of the land is in our language. *Windspeaker* 21(10), 18-33.

Thom, B. D. (2005). Coast Salish senses of place: Dwelling, meaning, power, property and territory in the Coast Salish world. (Doctoral Dissertation, University of Victoria).

tisholas. (2022). *sqwiilqwul'tul 'words used when talking to one another': Speaking our hul'q'umi'num' language with our land*. (Master's thesis, University of Victoria).

Tla'amin Nation. (2020). *Language*. https://www.tlaaminnation.com/home-page/language/

UNESCO. (2019). *Siku: Mixing high-tech with ancient know-how*. UNESCO.org. https://www.unesco.org/en/articles/siku-mixing-high-tech-ancient-know-how-0

United Nations. (2007). *United Nations Declaration on the Rights of Indigenous Peoples*. https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

University of Victoria Human Research Ethics Board. (2020). *Annotated guidelines for completing the Human Research Ethics Board application for ethics approval for human participants*. Retrieved from https://www.uvic.ca/research-services/assets/docs/Ethics/Annotated%20Guidelines%20HRE%20Application%20Form.pdf

Waller, D. M., & Reo, N. J. (2018). First stewards: ecological outcomes of forest and wildlife stewardship by indigenous peoples of Wisconsin, USA. *Ecology and Society*. Resilience Alliance.

Wehi, P. M., Whaanga, H., & Roa, T. (2009). Missing in translation: Maori language and oral tradition in scientific analyses of traditional ecological knowledge (TEK). *Journal of the Royal Society of New Zealand*.

Kinsta. (2023, October 18). *What Is a Content Management System (CMS)?* Kinsta. https://kinsta.com/knowledgebase/content-management-system/. Retrieved March 23, 2024.

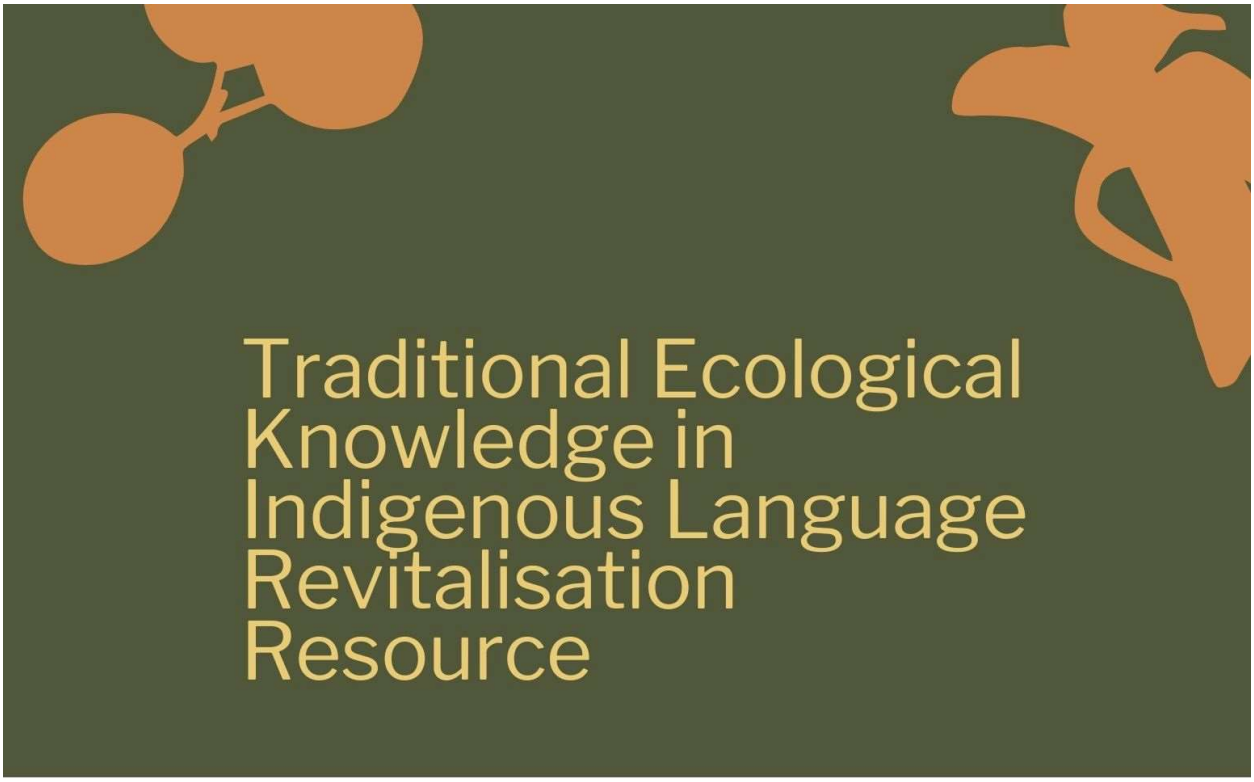
Wilson, B. (April 14, 2023). Personal communication.

Wilson, S. (2008). *Research is ceremony: Indigenous research methods*. Fernwood publishing.

Wilson, S. (2007). Guest editorial: What is an Indigenist research paradigm? *Canadian Journal of Native Education*, *30*(2), pp. 193-195. Retrieved from https://ojs.library.ubc.ca/index.php/CJNE/article/view/196422/191664

Appendix A

Resource



A resource for including Traditional Ecological Knowledge in Indigenous Language Revitalisation work

2024

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Drew Blaney
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June Johnson
Betty Wilson
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Dr. Su Urbanczyk
Dr. Tatiana Degai

Preface

Background

This resource is informed by expert practitioners during interviews in addition to a literature review, both of which can be found in more detail in the thesis of which this resource is part.

Purpose

The information contained in this resource is intended to be used by instructors of Traditional Ecological Knowledge (TEK) and Indigenous Language Revitalization (ILR) in the context of their revitalization work, or by non-Indigenous instructors who would like to learn more about how to include TEK in a respectful way in their classes. This resource can support this work with the presentation of knowledge imparted by Indigenous experts during interviews, the analysis of which can be found in the accompanying thesis. This resource is organized thematically following the accompanying thesis and with supporting quotes from interviews with Indigenous experts, as well as supporting quotes from other sources; it ends with possible activities for learning or teaching TEK and language in tandem. The information in this resource comes from those who are already working for the betterment of their communities.

Introduction

The goal of this resource is to provide a useful resource for people involved with Indigenous Language Revitalization (ILR) and Traditional Ecological Knowledge (TEK). This includes providing a broad overview of what the field looks like and relaying information from expert practitioners. Additionally, the 'further reading' section at the end of the resource provides links to other free, accessible resources and webpages.

Indigenous communities are diverse in many ways – languages, cultures, ecologies – and needs will vary widely for language learning and TEK. This resource is meant to provide a broad overview for those wishing to learn more about how to incorporate TEK in their language classes, for varying levels of knowledge.

This resource was guided by knowledge imparted by Indigenous experts in ILR and/or TEK during interviews, the analysis of which can be found in the accompanying thesis.

Words used in this resource

Traditional Ecological Knowledge (TEK): In this resource, Traditional Ecological Knowledge (TEK) refers to ways of interacting with local environments which have been passed down in Indigenous communities for generations; TEK is included in songs and stories, place names, traditional technology, medicines, and foods. Other words that describe TEK include connection to the land, Indigenous science, and local ecological knowledge.

Ecology: Ecology refers to the study of interrelated actions of living things in nature; how they interact with themselves and with the land, including eating (what and how), reproducing, migrating, hibernating, fighting, sprouting, and growing.

Language Revitalization: Language revitalization refers to the act of increasing the domains of language use in a community. Indigenous language revitalization (ILR) is the revitalization of Indigenous languages.

Language Reclamation: Language reclamation is what Wes Leonard refers to as "a larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives."[1]

[1] Leonard, 2017, "Producing language reclamation by decolonising 'language'", p. 19

Section 1: Learning by Doing: TEK and Language in the same Lesson

There are as many reasons and as many ways to teach TEK and language in the same lesson as there are languages. Several are explored below:

Learning TEK in the language lessons:

Language and TEK are interconnected specifically in a language learning setting, involving both the contents and methods of learning and instruction of TEK and language:

Content of Lessons

1. The term 'semantic domain' refers to specific categories of meaning. For example, activities such as weaving and carving use specialized vocabularies. Learning these skills not only helps revitalize and maintain these skills, but also the terms for these activities in the language
2. Learning the language along with TEK and connection to the land allows for insight into worldviews that are carried by the language and TEK; many of these connections need language to emphasize, and understand them.
3. Learning TEK can introduce learners to and have them learn from community members who already have these skills.

Methods of Learning

1. Learning Indigenous ways of knowing and being is important when learning an Indigenous language, and learning TEK is a way of introducing or elaborating this.
2. Using stories in lessons can also pass on TEK, as stories often contain traditional knowledge. Instructors teaching with stories can help learners experience narrative forms, new or challenging grammar, and new vocabulary.
3. Often, TEK is taught using hands-on methods. Hands-on learning keeps learners engaged and interested, and helps improve dexterity/fine motor control, as well (depending on the activity)

Learning TEK is learning science

Learning Indigenous languages is an excellent opportunity to also learn Indigenous science, including chemistry, physics, botany, zoology, and mathematics. Learners can learn language at the same time as they learn other skills.

"With math, it was just so painful, and then, oh! …He says, I love the way you use polynomials in your weaving, you know? I went … I don't know what a polynomial is! I open the dictionary and go, oh, okay, so that's a polynomial! You know? Unconsciously using math that, it also needs to be shown to other kids" Betty Wilson

"Working with people that know traditional knowledge, you're able to learn new words, I think, that could have been lost…with Betty working on the fish trap project, I didn't know that wuχo was our word for fish trap. Right. So, working with different knowledge keepers that…know different things, I think we're able to identify different words that some other people may not know" Drew Blaney

"there's a chemical reaction, once you take the root once you take the root off the tree a chemical reaction happens. You have to move quickly, because we've learned to take the outer bark off of the root fairly quickly, split it before it's too dry and hard, and all of those is a chemical reaction. So, our Elders knew that." Betty Wilson

Teaching TEK in language classes brings more opportunities to:

Incorporate Indigenous Ways of Instruction

Teaching using traditional hands-on, activity-based methods on the land is a way to align with Indigenous values while teaching language, such as teaching using hands-on methods or story.

"Learners focus on experiential, organic learning in an immersive, land-based setting that fosters healing. This approach—language learning on the land—is not new; our ancestors lived this way, but, because of colonization, it might seem new and innovative. This perception is only due to the way we have been schooled, through residential schools and mainstream education"[2]

"Because when you're in the bush, I would say, okay, this is salmonberry, this is ḵa̱mdza̱kw, and I would show the other part is, this is the salmonberry sprouts, sḵ́wa'ła̱m, so they're learning the names of the plants as we're doing the walk. I find that doing the nature walk, especially with kids in elementary, and kids in high school students, they're learning a lot through going on hands-on and seeing the plants and what they were used for" June Johnson

"I think it's important to work with, you know, people that work in different fields, whether it be medicines or carving or, you know, fish traps, fishing, hunting, they might have learned different words...growing up, you know, practising those things with your parents or grandparents and...collectively, then we all come together we're like, able to learn from each other. Right. So, I think it's really important that we work with our knowledge keepers" Drew Blaney

Teaching with Story

Stories contain much information about and understanding of TEK, such as name origins, botanical knowledge (such as harvesting times, uses, and resource management such as how much or little to gather, when, and how), and zoological knowledge (such as migration patterns and timelines) or origin stories of people and more. Recording stories also means recording the language in a different register (speech may be different when telling stories). Stories contain many lessons beyond TEK, as well, such as history, moral guidelines, or humor.

"there are many stories about land, places. There's stories, origin stories about the trees, there's origin stories about the birds, there's origin, there's creation stories about the four directions. Like all of that, I would say, is a part of this TEK" Belinda

[2] Belinda Daniels, Randy Morin, Bill Cook & Dorothy Thunder, 2022, p. 6
[3] Mowatt et al. 2020, p. 19

Section 2: Language Reclamation

Language reclamation is defined as “a larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives”[6]. Language revitalization, meanwhile, deals specifically with reversing the effects of language shift in endangered language communities. Additionally, language reclamation “Calls for an ecological approach to language work, one that recognises how language is never independent from the environment in which its speakers (and potential future speakers) live[7]”. The connection between land and language is of central importance in Indigenous language reclamation.

Learning language through and with TEK supports language reclamation by:

Reinforcing pride in language and culture

Learners want to learn and are excited to learn their language, but sometimes trauma from residential schools and the western education system can create negative associations with speaking their language[8]. Learning TEK won’t immediately undo these harms, but “language and land interaction are holistic and contribute to wellness and a strong, positive identity.”[9] Language reclamation means “speaking the language proudly, and, most important, sharing it with others”[10]

“there is a great demand of our younger people to learn the language, and they're proud of it -- learning the cultural, traditional skills” Betty Wilson

“This connection to a safe space nourishes us and our identity as Indigenous Peoples and helps to heal the wounds left from the traumatic loss of language. . . We need to remember, reminisce, and practice how our Ancestors lived and learned on the land. The land nourishes and teaches us about who we are and where we come from. The connection to land and language helps Indigenous Peoples to feel a greater connection to and inclusion within our communities and is important to bridge the gap that the decades of residential schooling severed between the generations”[11]

[6] Leonard, 2017, p. 19
[7] Ibid
[8] Nêhiyawak Language Experience Camp Guide, 2022
[9] Ibid, p. 22
[10] McCarty et al., 2018, p. 162

Section 2 (continued)

Decolonizing Instruction

Teaching on the land can create a safe space to learn language[11]. Decolonizing instruction means including Indigenous ways of being and doing when teaching. Reconnecting to the land and creating a supportive environment for language learning can be very helpful for learners to feel confident and connected while learning their language.

"language and identity are focused on and enhanced when reclaiming language in a natural context, out in nature… A safe space is essential to language learning on the land and online"[12]

"I tell them, I'm not teaching it the colonized way, where we have to take notes. If you want to take the notes, like with the language, fine, but we're not, how I'm going to teach you is almost like on hands and stuff, like with repetition. Yeah, with the language. So we don't, I don't teach it the colonized way because I'm decolonizing it. And Indigenizing the language" June Johnson

Foster connections to land and reciprocity

Learning TEK through language helps connect learners to the land, and learning from the land teaches language. Learning on the land also teaches important values such as reciprocity and respect.

"When we're reclaiming language, land is teacher. So, when I say *askiy* [land], the word *askiy*, you can also find it in the word, *kîskinwahamakewin*, which is to teach. And the word *ski* is in there. So, land as teacher. So that's one example how land and our language are intertwined." Belinda Daniels

"more stories grow as community members are actively involved in bringing their own version of joy and well-being on the land into the future. The students now have a place to go where they feel safe and familiar…and can engage in practices that foster a sense of place and pride in their … identity"[13]

[11] Nêhiyawak Language Experience Camp Guide, 2022, p. 2
[12] Nêhiyawak Language Experience Camp Guide 2022; FPCC Sense of Place Symposium
[13] Nêhiyawak Language Experience Camp Guide 2022, p. 3

Section 3: Not just words, but also concepts: learning worldview through TEK and ILR

This theme is about learning the worldview and complicated concepts which a language carries, and which TEK can support. One word can have a very deep connection the culture behind it. Context from knowing much of language and worldview is often more complicated than can be communicated in one word. This relationship is displayed in the intricacies of language. The concepts behind the word offer much more context than just a direct translation may provide.

"with the *wilkw*, cedar tree, they always said it's the tree of life because it clothed us with the cedar bark; we made canoes with it; big houses; paddles; regalia... we've always called it the tree of life" June

"Our language gives us a worldview, gives us a perspective, and how to relate to the land. It's a, a kinship system embedded in the language for us to also help the land. So, for instance, if we think of trees as our kin, such as brothers and sisters, mîtosak, and they're alive with spirit." Belinda Daniels

"when I talk about [plant names], when I know the SENĆOŦEN word I'll repeat it so that [learners] learn too. Like the snowberry is, the berries are poisonous, the white berries; and the name of that one is PEPKÍOŦ... And it means 'little revenge berry'. Because we believed in karma. That you did good things, good things would happen to you. And if you did bad things, bad things would happen to you... you'd sneak it into the food of someone that slurred your name or had done something against your family [for revenge]" Earl Claxton, Jr.

"*ǰɛǰɛ* can be a tree, or it can be your relative. *q̓aƛ̓əm*, which is your liver, *q̓aƛ̓əm* can mean heavy, or it could mean your liver. *ʔɛmɛn* could be the road, or it could be a door. Okay. So those are just very quick examples of how we use words" Betty Wilson

Section 3 (continued)

Place Names

Place names can be seen as a record or connection to history. Place names and their stories show many of the ways names connect speakers to land. Place names relate events, as well as being descriptive.

> "knowledge of place names is very important and shows our length of time that we've lived here. We have a special name for each of the places, and each of the words have significant meaning of why it's called that...SN̓IDȻEŁ, Place of the Blue Grouse, was our first village site, and that, it was called that because there were so many blue grouse there. They like to roost in the branches of the trees, and there were so many they filled all the branches, all the trees, down to the lowest branches. So that's pretty amazing to have seen that, which I never did. By the time I came around, I had no knowledge of any blue grouse in SN̓IDȻEŁ, when at one time there were so many; it was likely an astounding thing to see." Earl Claxton, Jr.

Section 3 (continued)

Language Archiving

Language archiving safe-keeps language data, such as recordings or writings, for future access. Choosing what to archive is an important task; what will best add to the archive is a decision which should be done on the terms of the language community. Transcription (of audio or audio/visual recordings) is an area where precise word or grammatical differences may require additional elaboration or technical explanations. Users may also benefit from archives for reasons which are not mainly language-related: searching for botanical or geographical knowledge retained in archives is a demonstration of the multi-faceted nature of archives[14].

> "With the Traditional Ecological Knowledge, it goes hand in hand with language archiving, we have a huge momentum in the four communities here in Tla'amin. . . another ǰeǰe media, you know, all working independently with different groupings of people. It's just that people I know able to concentrate just on archiving, because it's gotten very technical with the grammatical structure. Okay, if you use an iota here, this is what that word means. Like, just to run. But if I change the Iota to an *I* . . . it means, actually, running."
>
> Betty Wilson

[14] Holton, Gary, 2012

Section 4: Learning TEK is learning to understand the land *and* language

Learning TEK and language teaches learners to understand the land and how to interact with it: not just about weather, winds, tides, seasons; but how to show gratitude to the land and the proper protocols for hunting, fishing and harvesting. How should one treat the land? How should one navigate the land and waters and one's relationship with it? These are enormous questions which learning TEK can help to answer.

Learning from the Land

Learning from and understanding the land, such as seasonal rhythms, weather systems, and how our actions affect the land helps provide context and connection to language and culture. Learning to be a steward of the land means learning how best to treat the land with respect and reciprocity – protecting both history and future.

"They shot this bear, black bear, and it didn't die, it took off. And they went to look for it. He found the Sitka spruce tree, where it had pitch, and he was rubbing where he got shot. Something that might help heal him. Unfortunately, he died, because he had quite a few bullet holes, but that's what he did, he went to find a tree, and they found him by the spruce tree where he'd been rubbing himself, trying to get the pitch to go into his wounds. So, the animals also know what are good medicines"
June Johnson

Tending to the land

Activities such as harvesting, clamming, fishing, gardening, or pulling invasive plants help teach how to tend for the land. Taking care of something brings and shows love. Additionally, providing a physical space on the land such as a garden or nature trails can provide a safe environment to learn and a safe space to speak the language.

"The Saanich found that if the roots were disturbed on the camas, they become bigger bulbs. It encourages bulb growth. So what they did was, they had fields of camas that, that they would dig up, and they had grass fields in amongst it, so they could cut, cut out sections with a digging stick and roll up the sod, and then take up the ones, the bulbs that they wanted, and roll the sod back. And that was enough to stimulate the bulb growth, was that rolling it up out of the ground, and then rolling it back and starting over again and wait 'til next year, whenever. Yeah. It's amazing technology" Earl Claxton

Section 4, cont.

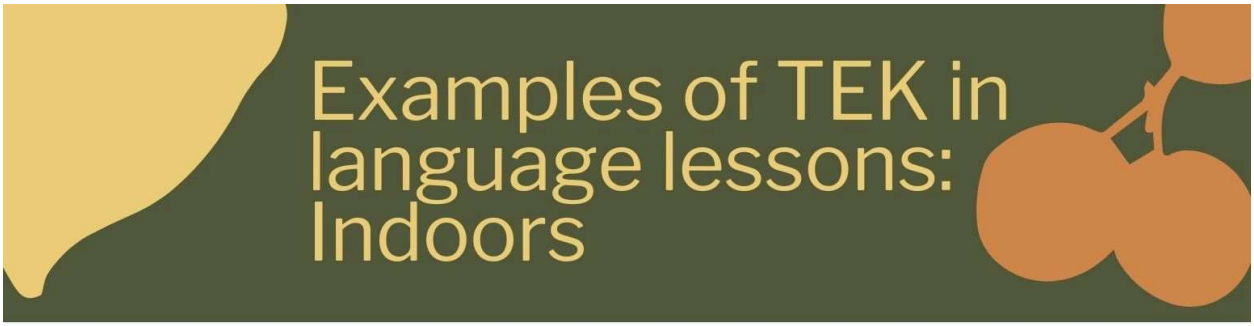
Protecting and monitoring the land keeps it from harm and helps pass it onto the next generations, along with those values which protect the land: Activities such as harvesting, clamming, fishing, gathering, or trapping are ways of interacting with the land. Caring for the land comes from interaction and familiarity with it.

"We've always been protectors of our land and water. So that has been going on, but now to teach the young people, the same as what was done in the past, and make sure that it's not overharvested – because, unfortunately, a lot of the clear-cut logging has taken away all those plants that were the non-timber forest products, like that grow underneath the trees. So, it's important for them to check out these areas, if there's any plants there, because like I said before, sometimes it's two hours to find a good place to get plants, and you've got to always watch that there's no contamination from oil spills from the logging companies. And people aren't over harvesting, that there's not going to be any for future generations. So, like it's so important to carry this on [so] that we don't lose sight of how important it is to learn about our territories, about our plants, our trees" June Johnson

Language comes from the Land

Learning TEK and language teaches learners to understand the land and how to interact with it: not just about weather, winds, tides, and seasons, but also how to show gratitude to the land and the proper protocols for hunting, fishing, and harvesting. How should one treat the land? How should one navigate the land and waters and one's relationship with it? These are enormous questions which learning TEK can help to answer. Continuing TEK involves practices of stewardship and sustainability.

"when referring to the sky, the sky in Cree is kîsik. We spell it kîsik. That's 'sky'. 'In the sky' would be kîsikohk: 'in the sky', 'on the sky', 'at the sky', so it's kind of like a locative. In, on, at. And the word for 'day' comes from the root word kîsik, kîsikaw. So, again, I'm giving you a relationality lesson. To see the sky, kîsik, is day, but yet, how it relates to my body, miskîsik, my eyeball. Which is related to the sky. So, our bodies are a reflection of the land and language comes from the land. So that's an easy, quick little lesson. Cause lots of people often ask me that: 'what do you mean, language comes from the land?' So that that's one example" Belinda Daniels



The following activities can be done at home or in a physical class setting.

Seasonal chart or calendar

Learning the names of months and seasons opens the door for further exploration, literally and metaphorically: marking seasonal changes is an opportunity to learn how to describe them year-round. The origin of month and season names as well as what environmental changes mark important times of the year, are good ways to connect learners to the seasonal rhythms of the land, as well as teaching them this vocabulary.[15] For example, certain plants' flowering schedules can be important indications of the time of year and signal seasonal activities.

"When [Ocean Spray] turns brown, the flower, that's time to head out and set the reef nets. So it was kind of our clock, I guess. Because when it first bloomed, which is just starting right now, the bloom, it, the people that worked them in, that worked on the reef net, they would be scrambling to finish any parts of the net they needed to finish or attach, attach them together. And it would start to get more frantic as the, 'cause when it turns brown, it's time to go out and catch the sockeye" Earl Claxton

Preparing traditional food

While collecting or harvesting food is best done outdoors, it can be done together as a class or can be a separate project. Gathering or harvesting offers a good way to introduce and practice protocols and language for harvesting from the land. Additionally, cooking (together or at home) traditional food offers a way to share and work creatively in a way that nourishes stomachs, hearts and heads. Learners can share food and recipes or present about what they've prepared or harvested.[16]

[15] One example of a seasonal charts or calendars is the Tla'amin Archaeology 13 Moons (https://www.tlaaminnation.com/archaeology/13moons.html)
[16] Gonella, Michael P., Daryl W. Baldwin, and Adolph M. Greenberg, 2015; Melzer, 2014

Examples of TEK in language lessons: Outdoors

The following are activities which work best out of doors to incorporate TEK while learning language.

Nature walks to learn names, uses for plants, animals, etc.

Nature walks help learners familiarize themselves with local species (or if they're already familiar, they can learn more!). And nature walks teach more than just vocabulary: they help learners to feel at home on the land. Walks can be short and close by or longer and farther away. Physical activity also helps learners learn!

"When you're in the bush, I would say, okay, this is salmon berry, this is *ḵ̓ɑ̱mdzɑ̱kw*, and I would show the other part is, this is the salmonberry sprouts, *sḵ̓wa'łɑ̱m*, so they're learning the names of the plants as we're doing the walk. I find that doing the nature walk, especially with kids in elementary, and kids in high school students, they're learning a lot through going on hands-on and seeing the plants and what they were used for." June Johnson

Games outside

Language games outside follow in the same vein as nature walks: they get learners outside and practicing language. Some games are good ways to practice more than vocabulary: for example, scavenger hunts or games like I Spy are excellent ways to practice phrases and conversation (see the Online Resources section for related resources links).

Gardening

Growing plants together as a class is a good way to learn about traditional food sources and relations with the land. Creating a garden is a way to create a nurturing space together where it feels safe to speak your language. If it works better, some plants can be grown from seed indoors in a windowsill or under a grow light. Learners can also take seedlings home with them and care for them there, although some plants require specific tending or growing conditions that are hard to recreate in a pot.

"As the young child helps tend the gardens that produce food…she will learn not only ethnobotany and the scientific language for traditional plants, but reciprocity; responsibility; belongingness; a sense of place; and respect for the land, the people, and the language" [17]

Canoe Trips

Learning how to canoe involves physical exercise, learning new vocabulary and communication between paddlers. When planning a trip, learners can learn how to read maps and make decisions involving distance, tides, weather, and route. These are all skills which can be taught collaboratively and involving discussion by participants, whether it's a quick out-and-back on a neighboring pond or a longer journey. Whether learners are learning this new skill from scratch (how do I hold a paddle?) or expanding on prior knowledge (what's the best way to right a tipped canoe?) there are lots of opportunities for learning and using vocabulary while also learning fun skills.

[17](McCarty et al., 2010, p. 170).

Summary

This resource presents wisdom from interviews with knowledge keepers who have worked for many years to reverse language shift and teach TEK. This resource is meant to present some of their knowledge and experience as shared in interviews as well as provide ideas. Because Indigenous languages and cultures are beautifully diverse, parts of this resource may be more useful or relevant than others; hopefully, it has provided some ideas and resources for practitioners who are involved in such work.

The lesson/activity ideas are kept intentionally non-specific in regard to age, class level, etc. of learners – instructors know their classes best and will be best able to customize their lessons to fit the needs of their class. Additionally, some of each of these categories can be found in other categories, as they are intertwined. Learning a little of one is learning a little of another.

Below are lists of free, accessible online resources following each of the above sections of as well as possible additional reading.

LANGUAGE THROUGH TEK RESOURCES

These are free resources which can provide information about or support lessons in learning TEK along with language.

Manitoba Aboriginal Languages Strategy Resource compendium:
https://www.malsmb.ca/resources.html

Turtle Lodge Report: Land-based Ojibwe Teachings
https://www.malsmb.ca/docs/turtle-lodge-land-report-2021.pdf

Free science resources for teachers (will need a free account)
https://greenlearning.ca/resources?grades=&subjects=&types=&topics=indigenous-studies&results=10

A Community Guide to Protecting Indigenous Knowledge
https://publications.gc.ca/collections/Collection/R2-160-2001E.pdf

Ecological Society of America TEK Resources
https://www.esa.org/tek/resources/

Indigenous Ways of Knowing and Science Teaching Resource Pinterest Board
https://www.pinterest.com/stemeducation/indigenous-ways-of-knowing-and-science-teaching/

LANGUAGE RECLAMATION ONLINE RESOURCES

These are free resources which can provide information about or support lessons in language reclamation.

Empowering the Spirit: Educational Resource to support reconciliation
https://empoweringthespirit.ca/

Weaving Ways: Indigenous Ways of Knowing in Classrooms and Schools
https://empoweringthespirit.ca/wp-content/uploads/2018/09/Weaving-Ways-Introductory-Document-10-09.pdf

Learning in Relation: A Guide to Creating Online Indigenous Language Courses that Center Indigenous Ways of Knowing and Being

dspace.library.uvic.ca/bitstream/handle/1828/14403/Chew%20et%20al._2022_Guidebook_LearningInRelation.pdf?sequence=6&isAllowed=y

Queen's University Library Decolonizing Education Resources
https://guides.library.queensu.ca/decolonizing-resources/teaching

CONCEPTS BEHIND THE WORDS
These are free resources which can provide information about and support in language documentation and archiving.

Indigenous Language Institute Language Programs Index
https://www.ilinative.org/directory/index.php/Category:Language_Programs

Endangered Languages Project
https://www.endangeredlanguages.com/

Harvard Library Indigenous Language Research Guide
https://guides.library.harvard.edu/c.php?g=1226355&p=8973149

University of Texas Austin Endangered Languages: Web Resources
https://libguides.uta.edu/EL/web

First People's Cultural Council Resource Library
https://fpcc.ca/resource/area/language/

Living Dictionaries
https://livingdictionaries.app/

Our Voices, Our Stories: First Nations, Metis and Inuit Stories: Educational Resources
(Archived) https://www.collectionscanada.gc.ca/stories/020020-4003-e.html

Siwal Si'wes Digital Library: Oral Traditions
https://swswlibrary.com/meaningful-contributions/oral-traditions/

University of Saskatchewan: Indigenous Studies Portal
https://iportal.usask.ca/using-iportal

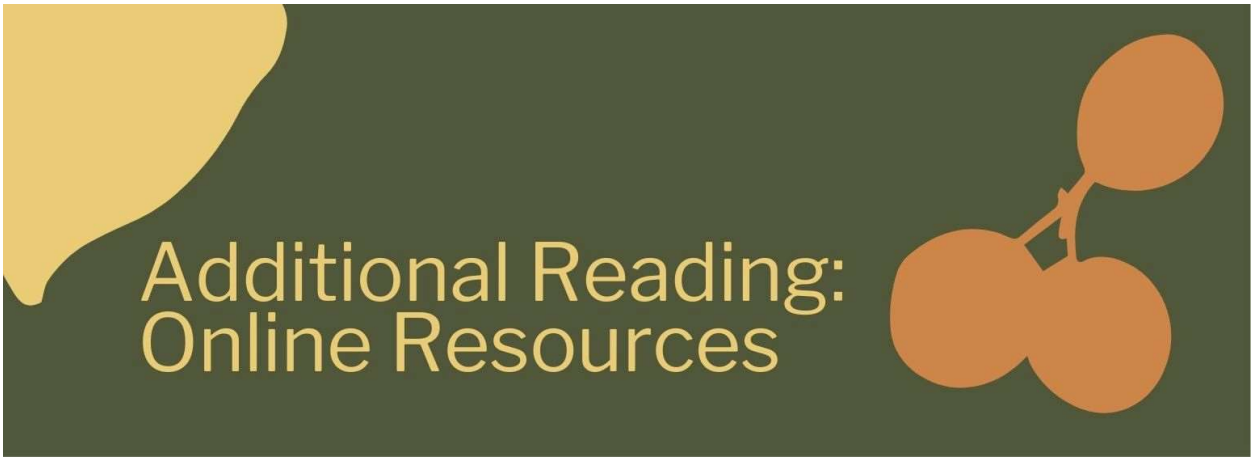
Archiving for the Future: Simple Steps for Archiving Language Documentation Collections
https://archivingforthefuture.teachable.com/courses/667854/lectures/15575841

UNDERSTANDING LAND AND LANGUAGE
These are free resources which can provide information about or support lessons in understanding both land and language.

National Park Service (USA): International TEK Literature
https://www.nps.gov/subjects/tek/international.htm

Learning in Places (free frameworks for educators, families, and communities for place-based science learning)
http://learninginplaces.org/

STEM Trading Cards: Traditional Ecological Knowledge
https://www.stemtradingcards.org/teklessons



These are links to online resources which may not be specifically oriented towards the intersection of TEK and ILR. They may need to be copy/pasted into your browser.

First Nations Digital Document Source
https://gsdl.ubcic.bc.ca/cgi-bin/library.cgi?e=d-00000-00---off-0firstna1--00-2----0-10-0- --0---0direct-10---4-------0-1l--10-en-50---20-about---00-3-1-00-0--4--0--0-0-01-10-0utfZz-8-00&a=d&cl=CL4

United Nations: Department of Economic and Social Affairs Indigenous Peoples Resources
https://www.un.org/development/desa/indigenouspeoples/publications/desktop-publications.html

Language Conservancy Learning Resources
https://languageconservancy.org/learning-resources/

California Climate Commons TEK Resources
http://climate.calcommons.org/article/tek

Growing the Fire Within: Exploring Innovative and Successful Adult Language Learning Methods in Indigenous Communities in Canada and the US
https://netolnew.ca/all-research-reporting/growing-fire-within/

(Scroll to the bottom of the page for additional resources for adult Indigenous language learners as well as training to support your language revitalization work)

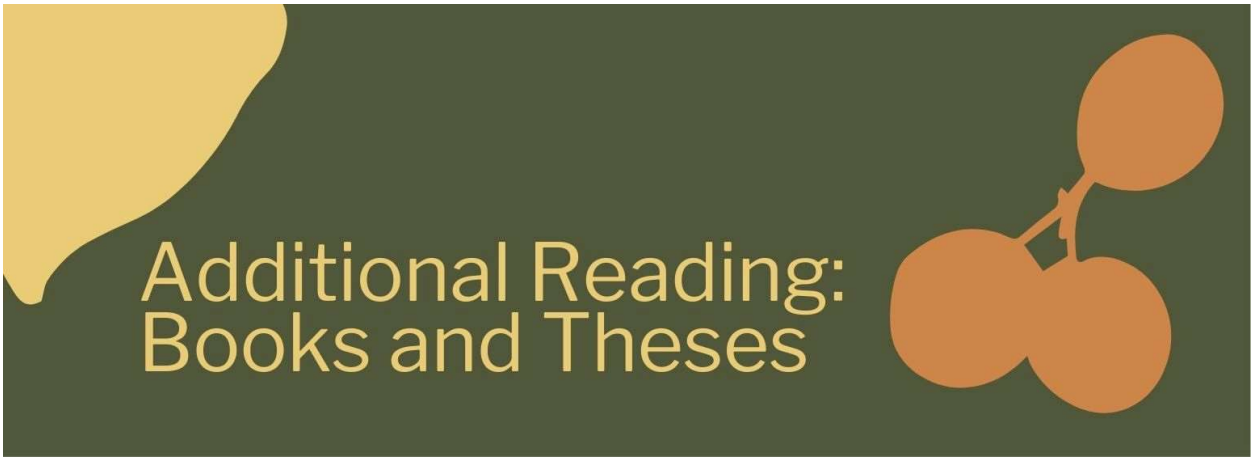
The National Centre for Collaboration in Indigenous Education: Teaching Resources
https://www.nccie.ca/teaching-resource-centre/

First Peoples' Cultural Council Resource Library
https://fpcc.ca/resource/programs_and_grants/firstvoices/

Assembly of First Nations Languages and Learning Sector
https://afn.ca/community-services/languages/

PEPAKEN HAUTW Website
https://pepakenhautw.land

Indigenous Navigator
https://indigenousnavigator.org/



Books:

Braiding Sweetgrass by Robin Wall Kimmerer (Milkweed Press, 2013)

Wisdom Sits in Places by Keith Basso (University of New Mexico Press, 1996)

Luschiim's Plants by Luschiim Arvid Charlie and Nancy Turner (Harbour Publishing, 2021)

Saanich Ethnobotany by Nancy Turner and Richard J. Hebda (Royal BC Museum Publishing, 2012)

Dawnland Voices: an Anthology of Indigenous Writing from New England, Siobhan Senior (Ed.) (Nebraska Press, 2014)

Wildlife Stewardship on Tribal Lands: Our Place Is in Our Soul, Serra J Hoagland and Steven Albert (Eds.) (JHU Press, 2023)

Theses:

Armstrong, J. C. (2009). Constructing indigeneity: Syilx Okanagan oraliture and tmixwcentrism (Doctoral dissertation, Ernst-Moritz-Arndt Universität Greifswald).

čuucqa Layla Rorick (2016). wałyaʕasukʔi naatnaniqsakqin: At the Home of our Ancestors: Hesquiaht Second Language Immersion on Hesquiaht Land (MEd Project, University of Victoria).

Daniels, B. C. (2021). ē kakwē nēhiyaw pimātisiyān ōta nīkihk: THE LIFELONG JOURNEY HOME (Doctoral dissertation, University of Saskatchewan).

Isaac, I. (2010). Understanding traditional ecological knowledge through Kwakwaka'wakw story. (MA thesis, University of Victoria).

Melzer, A. M. (2014). Language reclamation, Food Systems, and Ethnoecological Revitalization: A Case Study on Myaamiaki Ethnobotany and Community-Based Participatory Research (Master's thesis, University of Cincinnati).

Belinda Daniels, Randy Morin, Bill Cook & Dorothy Thunder. Nêhiyawak Language Experience Camp Guide 2022: How to Start a Language Experience Camp: Tânisi Ka-Êsi Mâcipitamihk Pîkiskwêwin Waniskâpicikêwin. Accessed December 30, 2023. https://nehiyawak.org/wp-content/uploads/2023/01/DANIELS_nehiyawak-Language- Experience-Camp-Guide-2022-Edited-Final-June.pdf.

Claxton, Earl Jr. and Moffat, Anna. Earl Claxton Jr.: TEK and Language interview. Personal, June 27, 2023.

Daniels, Belinda and Moffat, Anna. Belinda: TEK and language interview. Personal, February 15, 2023.

Gonella, Michael P., Daryl W. Baldwin, and Adolph M. Greenberg. "Community-led ethnobotanical triage: Case study—Myaamia corn traditions." *Ethnobotany Research and Applications* 14 (2015): 517-531.

Johnson, ‘umagalis June and Moffat, Anna. ‘umagalis June: TEK and language interview. Personal, May 13, 2023.

Leonard, Wesley Y. "Producing language reclamation by decolonising ‘language’." *Language documentation and description* (2017).

McCarty, Teresa L., Sheilah E. Nicholas, Kari AB Chew, Natalie G. Diaz, Wesley Y. Leonard, and Louellyn White. "Hear our languages, hear our voices: Storywork as theory and praxis in indigenous-language reclamation." *Daedalus* 147, no. 2 (2018): 160-172.

Melzer, Annie Maria. "Language Reclamation, Food Systems, and Ethnoecological Revitalization: A Case Study on Myaamiaki Ethnobotany and Community-Based Participatory Research." PhD diss., University of Cincinnati, 2014.

Mowatt, Morgan, Sandrina de Finney, Sarah Wright Cardinal, Gina Mowatt, Jilleun Tenning, Pawa Haiyupis, Erynne Gilpin, Dorothea Harris, Ana MacLeod, and Nick XEMŦOLTW̱ Claxton. "ȻENTOL TŦE TEṈEW̱ (together with the land): Part 1: Indigenous land-and water-based pedagogies." *International Journal of Child, Youth and Family Studies* 11, no. 3 (2020): 12-33.

“Sense of Place Symposium.” fpcc.ca, February 2022. https://fpcc.ca/wp-content/uploads/2022/04/FPCC-Sense-of-Place-Symposium-DIGITAL-Spread_HM.pdf.

Sugiyama, Michelle Scalise, Marcela Mendoza, and Itzel Quiroz. "Ethnobotanical knowledge encoded in Weenhayek oral tradition." *Journal of Ethnobiology* 40, no. 1 (2020): 39-55

Appendix B
Interview Questions

Preamble

As mentioned, I am studying the ways in which Traditional Ecological Knowledge (TEK) can be included in or aid language revitalization. During my time in undergraduate studies at the University of Massachusetts, I became interested in languages and linguistics. Linguistics connected the two separate points of "language" and "people". At my seasonal work in the White Mountains of New Hampshire I learned the value of nature, and in school I learned the value of languages. As I learned more about Indigenous language revitalization, I began to see how people connect these two topics.

The questions in this interview are designed to look into several research questions: Do people include nature in their language revitalization work? If so, *how* do people use nature in their revitalization work? What are the effects of including nature in language revitalization work? This is a respectful and open place. Please feel free to answer each question as best suits you personally, and take the time you need to explain or share your thoughts and opinions on the topic. I hope you will feel comfortable sharing how you understand these topics (TEK and language revitalization), and what they mean to you.

Questions

1. Can you tell me a bit about your story, and how you got into this work?
2. What form does your language work within the community take? Does this work involve Traditional Ecological Knowledge, and if so, how? How do you define TEK?
3. Where are you in your language journey (fluent, native speaker, second language learner, etc.?)
4. Why is it important to you to work with TEK, in general or within your language work?
5. How do you think nature can help in your language revitalization and reclamation work?
6. Do you think knowledge of TEK affects how you or others learn your language? If so, how?
7. How do you use Traditional Ecological Knowledge when learning or speaking your language?
8. Do you think it is important that language learners engage in or learn TEK? Why or why not?
9. What challenges do you or other learners find with using TEK in language classes? How do you work to overcome these challenges?
10. Do you have a favorite lesson involving TEK and/or your language that you would like to share?
11. Some languages show a connection with nature in their lexicon; for example, in ʔayʔaǰuθəm, ǰɛʔǰɛ means both "tree" and "cousin". Do you know if there are any words or phrases in your language that also show the connection with nature and other concept like this? If so, can you share them with me.
12. One of the goals of this project is to create a useful resource that will help return some of the knowledge I have found in this research to communities. I'd like this resource to be useful, and your input as an expert in your field is very valuable. If such a resource would help support and benefit your work, what would you recommend be included?

Appendix C

Participant Consent Form

University of Victoria

Participant Consent Form

Traditional Ecological Knowledge in Language Revitalization

You are invited to participate in a study entitled Traditional Ecological Knowledge in Language Revitalization that is being conducted by Anna Moffat.

Anna Moffat is a graduate student in the department of Linguistics at the University of Victoria and you may contact her if you have further questions by email.

As a graduate student, I am required to conduct research as part of the requirements for a degree in Linguistics. It is being conducted under the supervision of Suzanne Urbanczyk. You may contact my supervisor.

This research is being funded by the University of Victoria Faculty of Graduate Studies.

Purpose and Objectives

The purpose of this research project is to investigate how communities use the natural world to further the cause of language revitalization, and to produce a research-informed, useable resource or tool to be used as a guide.

Importance of this Research

This research will provide a starting place for people who a) wish to know more about using TEK in language revitalization or b) people who are already involved in the movement, but who may

want to know more about other global perspectives. The inclusion of interviews with experts will bring additional insight, including a greater depth of knowledge, experience and perspective to this work.

Hopefully this project will inspire others to find new ways to connect with their language(s) and the world around them, supporting themselves and their communities. Finding new ways of introducing languages to people may inspire consistent and effective study.

Participants Selection

You are being asked to participate in this study because you are knowledgeable about Indigenous Language Revitalization as well as Traditional Ecological Knowledge (TEK). Whether you choose to participate or not will have no effect on your position [e.g. employment, class standing] or how you will be treated.

What is involved

If you consent to voluntarily participate in this research, your participation will include an interview approximately 1 hour long, which may be longer if needed and if availability allows. This interview will be held over Zoom or in person at a location of your choice, and will be recorded and transcribed. You will receive both the full transcript and recording of the interview and a copy of what is being used in the thesis. These both will be sent to you before final revisions on the thesis, and your opinion on how it is being presented will be taken into consideration, and necessary alterations will be made.

Inconvenience

Participation in this study may cause some inconvenience to you, including time spent for the interview or transportation to the location of the interview if it is in person; efforts to mitigate this inconvenience include using Zoom and the ability for you to choose where you would like to hold an in-person interview. If a meeting time is creating schedule conflicts, please let me know and we can reschedule for an easier time.

Risks

There are no known or anticipated risks to you by participating in this research.

Benefits

This research will provide a starting place for people who a) wish to know more about using TEK in language revitalization or b) people who are already involved in the movement, but who may want to know more about other global perspectives. The inclusion of interviews with experts will bring a greater depth of knowledge, experience and perspective to this work.

Hopefully this project will inspire others to find new ways to connect with their language(s), supporting themselves and their communities.

Compensation

As a way to compensate you for any inconvenience related to your participation, and to thank you for sharing your wisdom and insights, you will be given a hand-made gift.

Voluntary Participation

Your participation in this research is to be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be permanently deleted from all digital data bases and will not be used in the thesis. Any paper hard copies will be destroyed. Compensation will still be provided.

On-going Consent

To be sure of continuing consent to participate in this research, I may follow up after the interview

to be sure that I have understood and conveyed the information you have shared with me accurately. If so, I will contact you again, to see if that is OK. You may withdraw at any point or redact any information, with no hard feelings.

Confidentiality

Because you will be sharing your valued knowledge with me, I would like to acknowledge you and thank you for your generosity in sharing your knowledge, without which this thesis would not be possible. This means that I will not keep your participation in this research confidential unless you request it. I will protect your privacy by keeping the interview recordings and transcripts in a safe, private location accessible only to me (i.e. a password-protected folder on my private computer). If you request confidentiality, I will use a pseudonym of your choice to refer to you and your responses in the results of the study and I will not identify your community. However, even if you request confidentiality, it will not be possible to keep your identity

confidential from my supervisors. Moreover, because I must identify the language you speak and the general geographical area you are from, it may be possible for readers to discover your community and perhaps your identity. If this is a significant concern for you, you may withdraw from the research. Interview recordings, transcripts, and data will be held on my personal password-protected computer, and within a password-protected folder if requested. Field notes will remain in my personal residence.

Please complete one of the following:

WAIVING CONFIDENTIALITY: I agree to be credited in the results of the study, and I agree to have my responses attributed to me by name in the results. _____ (Please initial)

REQUESTING CONFIDENTIALITY: I do not agree to be identified by name or credited in the results of the study. Please keep my name and identity as confidential as possible. _____ (Please initial)

Consent to Inform Your Community

I would like to respectfully inform your community of this research project and your participation. If you consent, I will send a letter to your community band office informing them of this research project and your participation. However, in the interests of confidentiality, I will not inform your community if you do not wish so.

Please indicate if you consent for me to inform your community of this research by completing one of the following:

YES, please inform my community of my participation in this research. _____ (Please initial)

NO, please DO NOT inform my community of my participation in this research. _____ (Please initial)

Dissemination of Results

It is anticipated that the results of this study will be shared with others in several ways: it will be shared directly with you, and may be used in scholarly presentations, such as North West Linguistic Conference; the oral exam will be open to the public, and, finally, the thesis will be published by the University and will be freely downloadable on the internet. I will give the you the opportunity to inform me if your community would like to receive a copy of the research results.

Disposal of Data

After the defense of the thesis, data (transcripts, analysis) will remain in your possession; other copies will not be kept and will be erased from digital storage or shredded and recycled, if in hard copy. Sections contained in the thesis will be in the public domain.

COVID

If in an in-person interview is requested, UVic Communicable Disease (CD) COVID-19 guidelines will be adhered to or exceeded with daily symptom monitoring, encouraging mask use, and promoting hand-washing and sanitizing. I will test myself for COVID before meeting up, and will be able to provide additional tests should you wish them. If I test positive, the interview will be rescheduled for a later date.

Contacts

Individuals that may be contacted regarding this study include

Anna Moffat

Suzanne Urbanczyk.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Consent

Your statement on the Zoom recording indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant		*Date*

A copy of this form will be emailed to you with your name and the date of the interview, and a copy will be kept by the researcher.

Appendix D

Letter of Information to the Community

University of Victoria

Letter of Information for the Community

Traditional Ecological Knowledge and Language Revitalization

A member of your community has been invited to participate in a study entitled Traditional Ecological Knowledge in Language Revitalization that is being conducted by Anna Moffat. Anna is a graduate student in the department of Linguistics at the University of Victoria and you may contact her if you have further questions. As a graduate student, Anna is required to conduct research as part of the requirements for a degree in Linguistics. It is being conducted under the supervision of Dr. Su Urbanczyk. You may contact Dr. Urbanczyk. This research is being funded by the University of Victoria Faculty of Graduate Studies.

Purpose and Objectives

The purpose of this research project is to investigate how communities use the natural world to further the cause of language revitalization, and to produce a research-informed, useable resource or tool to be used as a guide.

Importance of this Research

This research will provide a starting place for people who a) wish to know more about using TEK in language revitalization or b) people who are already involved in the movement, but who may want to know more about other global perspectives. The inclusion of interviews with experts will bring additional insight, including a greater depth of knowledge, experience and perspective to this work.

Hopefully this project will inspire others to find new ways to connect with their language(s) and the world around them, supporting themselves and their communities. Finding new ways of introducing languages to people may inspire consistent and effective study.

Participant Selection

A member of your community has been asked to participate in this research. This person is _____ (hereafter "the participant"), and is being asked to participate in this study because they are knowledgeable about Indigenous Language Revitalization as well as Traditional Ecological Knowledge (TEK). Whether they choose to participate or not will have no effect on their position [e.g. employment, class standing] or how they will be treated.

What is involved

This research involves an interview approximately 1 hour long, which may be longer if needed and if availability allows. This interview will be held over Zoom or in person at a location of the participant's choice, and will be recorded and transcribed. The participant will receive both the full transcript and recording of the interview and a copy of what is being used in the thesis. These both will be sent to the participant before final revisions on the thesis, and the participant's opinion on how it is being presented will be taken into consideration, and necessary alterations will be made.

Benefits

This research has several benefits. This research will provide a starting place for people who a) wish to know more about using TEK in language revitalization or b) people who are already involved in the movement, but who may want to know more about other global perspectives. The inclusion of interviews with experts will bring a greater depth of knowledge, experience and perspective to this work. Hopefully this project will inspire others to find new ways to connect with their language(s), supporting themselves and their communities.

Risks

There are no identified potential risks to the community by this participant's participation in this research. All risks to the participant will be addressed immediately by the researcher.

Withdrawal of Participation

Participation in this research is be completely voluntary. The participant may withdraw at any time without any consequences or any explanation. If he/she withdraws, I will request his/her permission to use the information gathered from our interview. If he/she consent, I will use this information in my research. If he/she does not consent, I will destroy this information immediately.

Confidentiality

Because the participant will be sharing with me his/her valued knowledge, I would like to acknowledge the participant in my research results. This means that I will not keep the participant's name, his/her Indigenous language, or geographical area confidential in this research unless the participant requests it. I will protect the privacy of your community by not referring to your community by name, unless you request it. I will also keep the interview recordings and transcripts in a safe, private location accessible only to me (i.e. a folder on my password-protected private computer).

Research Results:

Storage:

The audio recording and transcript of our interview will be kept in a file on my password-protected personal computer. Handwritten notes will remain in my personal residence. After the defense of the thesis, data (transcripts, analysis) will remain in the participant's possession; other

copies will not be kept and will be erased from digital storage or shredded and recycled, if in hard copy. Sections contained in the thesis will be in the public domain.

Dissemination:

The research results will be immediately used in my thesis. I may also share this research in a published article, a class presentation, or a presentation at a scholarly meeting. I would also like to share this research with you. I will give the participant the opportunity to inform me if he/she/your community would like to receive a copy of the research results, including the thesis and/or a copy of the website analysis tool I will develop as a part of this project.

Contacts

Individuals that may be contacted regarding this study include:

Anna Moffat

Dr. Su Urbanczyk

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria. Should you have any questions or concerns regarding this research, please contact me immediately.

Department of Linguistics, University of Victoria PO Box 3045 Victoria BC V8W 3P4

Please retain a copy of this letter for your reference.

Appendix E

Website Review Questionnaire

General Website Information
Name of website:
Web address of homepage:
Date accessed:
Copyright date/Website date (if any): N/A
Size of site (# of Pages: Tiny 1-5; Small 5-20; Medium 20-50; Large 50+):
Website Author / Promoting organization:
Language Information
Indigenous Language name:
Indigenous Language family:
Indigenous Language location:
Primary language of site:
Primary purpose of site:
    Language education/Other
Is there monolingual content?
Media Content
Does the website have sound files?
    What type?
Does the website have videos?
    What?
Does the website have pictures?
Are there pictures of TEK?
Does the website have map(s)?
Does the website have resource links?
    To what? Community organizations, First Nations sites, Language sites, Educational sites
Education Content
What educational resources are on the website?
□ Word lists
□ Phrases / phrase book
□ Dialogues
□ Dictionary
□ Language games
□ Metalinguistic discussion (ie. grammar explanations)
□ Songs
□ Stories
□ Videos
□ Other:
Are there options for interactive learning or posting user-generated material on the website?
TEK in Language Lessons:
Is there mention of TEK and/or items related to TEK (i.e. travelling, hunting, fishing, harvesting food, medicine, geographic features, weather)? [Yes / No]
    What?

Where do they appear?
Are there pictures or videos of people using TEK or explaining it? [Yes / No]
What?
Where do they appear?
Are there instructions for TEK? [Yes/No]
What?
Are there links to videos, instructions or other resources for learning TEK? [Yes/No]
What?
Are there songs, stories or other oral traditions including or about TEK? [Yes / No]
What?
How many?
Where do they appear?
Is there mention of TEK or TEK education in the introductory material (i.e. a direct or indirect reference)? [Yes / No]
What?

Learning Concepts Behind Words:

Are there instructions for TEK with associated vocabulary learning? [Yes / No]
What?
How many?
Where do they appear?
Is there information on presentations about or experts of TEK? [Yes / No]
What?
Are there links or sign-ups for TEK classes (including Mentor-Apprentice or immersion camps)? [Yes / No]
What?
Is there mention of users' interaction with language documentation (such as documentation at home)? [Yes/No]
What?

Keeping connection to the land:

Are there any stories, songs, videos, or other educational material that demonstrate the attitude towards TEK or traditional knowledge transmission? [Yes / No]
What?
Are there any stories, songs, videos, or other educational material that demonstrate the attitude towards learning language on the land? [Yes / No]
What?
Are there any links for opportunities to learn on the land? [Yes/No]
What?
Is there audio media about TEK (i.e., environmental sounds, instructions, etc.)? [Yes / No]
What?
Where do they appear?