Wilaat Hooxhl Nisga'ahl [Galdoo'o] [Ý̱ans]:

Gik'uuhl-gi, Guuń-sa ganhl Angoogam̓

Using Plants the Nisga'a Way: Past, Present and Future Use

By

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B.Ed., University of British Columbia, 1992
M.Sc., University of Victoria, 2003

A Dissertation Submitted in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy

In the School of Environmental Studies

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ABSTRACT

This dissertation was undertaken in collaboration with the Nisga'a First Nation of northwestern British Columbia to document their traditional plant knowledge. This information was gathered through collaborative audio recorded open-ended discussion with 21 Nisga'a elders, supplemented with material from the published literature and archival sources.

Background information with respect to the Nisga'a culture, language, geography, plant classification and resource management is documented in the past and as exercised today. Nisga'a names or uses of 110 plant species are described. Of these, 72 species were documented as having been used for food, 52 for medicinal purposes; 12 for spiritual purposes and 70 for technological purposes. The role of plants in traditional Nisga'a culture is further explored through comparisons of plant distribution, plant names and pre-contact trade between the Nisga'a and their immediate neighbours, the Gitxsan, Tsimshian, Haida, Tahltan and Tlingit First Nations. Maps are presented which highlight the distribution of seven plant species traditionally important in these cultures: *Shepherdia canadensis* (soapberry), *Vaccinium membranaceum* (black huckleberry), *Oplopanax horridus* (devil's club), *Corylus cornuta* (beaked hazelnut), *Malus fusca* (Pacific crabapple), *Veratrum viride* (false hellebore), and *Taxus brevifolia* (western yew).

Currently, one of the plants most important to the Nisga'a is **wa'ums** or devil's club (*Oplopanax horridus*). Devil's club stems were measured in clearcuts of different ages to examine how quickly this important spiritual and medicinal species recovers after logging. Results suggest that although devil's club does persist after clearcut logging, stems of a suitable size are rarely found in cutblocks less than 10 years old and that time since logging only partially accounts for the persistence or recovery of this species.

The dissertation concludes with a discussion of historical Nisga'a plant knowledge. The gender of those who have held and transmitted traditional knowledge and the gender of present knowledge holders is tabulated and discussed. Results suggest that although both men and women hold and pass on traditional knowledge, women were and still are more commonly involved in its transmission to the next generation. Current plant uses are highlighted and prospects for the sustainable use of plants for personal and commercial purposes are discussed.

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Thank-you to my supervisor, Dr. Nancy Turner, for guiding me through this work. Thank-you also to members of my committee: Dr. Barbara Hawkins, Dr. Eric Higgs, Dr. Leslie Saxon and Dr. Valentin Schaeffer for their support and helpful comments. Special thanks to Dr. Leslie Johnson for agreeing to be the external examiner and for her thoughtful comments on my dissertation. Sigidimnak̲’ Ts'aa Gabin (Verna Williams) often helped me with the spelling and grammar of Nisga’a words as did Sigidimnak̲’ Hagwilook̲’am saxwhl giis (Irene Seguin). Dr. Marie- Lucie Tarpent, Dr. Bruce Rigsby, Dr. Margaret Anderson and James Crippen shared their expert advice, opinions and guidance on linguistic topics. I thank Nancy Alexander, Trevor Goward, Kimi Hisanaga, Trevor Jobb (Northwest Timberlands), Dr. Trevor Lantz, Nancy-Anne Rose, Bryan Pettit, and Dr. Tongli Wang for their help in other areas.

Warm hugs and love to my family who never stopped believing that I would actually finish this work. A very special thank-you to Phil Burton, my unofficial advisor, my husband, and my friend, who always encouraged me.

Dedication

This work is dedicated to the Nisga'a knowledge holders who have passed on. In doing this work I was fortunate in being able to access information in the Nisga'a literature from many elders who passed on before I began my work. During the course of my field research, five people whom I had the good fortune to meet and work with have passed on. I fondly remember Sim'oogit Bayt Ńeek̲hl (Jacob Mckay), Sim'oogit G̲adim G̲aldoo'o (Charles Alexander), Sim'oogit Nelson Leeson, Sigidimnak̲' Ax̲dii Ksiiskw (Grace Nelson) and Sigidimnak̲' Kwhligyoo (Lavinia Azak); I thank them for their help and friendship. I am sorry that I did not personally get to hand you this completed work, but I like to think that you know it has been done.

Preface

The contributions of the following people were essential to the completion of this work. The information presented here belongs to the Nisga’a Nation. Permission to reprint or present any portion of this dissertation will require consent of the Nisga’a which can be requested through the Wilp Wilxo’oskwhl Nisga’a Institute in Gitwinksihlkw, BC.

Nisga’a Research Collaborators

Gitlaxt’aamiks

Sim’oogit Hleek (Dr. Joesph Gosnell)
Sigidimnak’ Ẃii Ts’iksna’aks (Pauline Grandison)
Sim’oogit Ksdiyaawak (George Williams)
Sigidimnak’ Ts'aa Gabin (Verna Williams)

Gitwinksihlkw

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Sigidimnak’ Hlgu Wilksithlgum Maaksgum Hlbin (Emma Nyce)
Sigidimnak’ Noxs Ẃeen (Peggy Nyce)
Sigidimnak’ Hagwilook’am saxwhl giis (Irene Seguin)
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Sim’oogit Ni’is Naganuus (Steven Doolan)
Sim’oogit Haym̓aas (Chester Moore)
Sigidimnak’ Axdii Ksiiskw (Grace Nelson)
Sim’oogit Gwiis Ha (Roger Watts)
Jeff Benson

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Chapter 1

Introducing the Nisga’a

> *No one person in an oral culture has all the knowledge of the people, for knowledge is held by many people in many different places. We will have to accommodate and adapt to our evolution as a culture, as we move forward and build into the future with the materials given to us by our ancestors. In the end, they will make us stronger as a people* (Sigidimnak’ Niysgankw’ajikskw – Lucy Williams 1995).

1.1. Introduction

This research to document Nisga’a traditional knowledge with respect to plants and their many uses embodies the spirit of the words of Sigidimnak’ Niysgankw’ajikskw. It represents collaboration with many Nisga’a who remember the ways their ancestors traditionally used plants, while acknowledging that other people might know more or remember something differently. Every research collaborator[1] in this study recalled watching parents and grandparents harvest and prepare food and medicine and make goods, maintaining the essence of their cultural traditions in the wake of the rapid changes thrust upon them. All of the collaborators acknowledge, somewhat wistfully, that they don’t do too many of these things themselves now, that not too many young people are interested in the old ways, and that their lives continue to change as commerce and technology change worldwide. However, even while adjusting to the rapid changes in their lives, they remain firm in their belief that young Nisga’a need to know, understand and respect their traditional knowledge, including knowledge about plants, even if it is learned through the written rather than the spoken word. They believe that the

[1] The terms “research collaborator (s)” and “collaborator(s)” are used interchangeably throughout this dissertation and refer to Nisga’a citizens who were integral to this research.

information they have willingly shared to be transcribed to written form will help instill pride in their culture while preserving and teaching cultural traditions that make them all uniquely Nisga'a. This new way of teaching and learning ensures that their traditional knowledge will be preserved and passed on to future generations even in a changing world.

1.2. Objectives

In 2007, with the approval of the board of the Wilp Wilx̱o'oskwhl Nisga'a Institute (WWNI) and the Nisga'a Lisims Government, I began collaborative work with the Nisga'a to document their traditional plant use and cultural knowledge of plants. Documenting traditional plant use naturally leads to exploring other aspects of Nisga'a culture that reflect their relationship with plants. The topics developed in this dissertation include the following:

1. Introduction to the Nisga'a and aspects of their culture (Chapter 1);
2. A species by species description of the Nisga'a names and uses of plants (Chapter 2);
3. A discussion on Nisga'a botany and plant classification (Chapter 3);
4. An examination of plant distribution as it relates to the exchange of both goods and language between the Nisga'a and their trading partners (Chapter 4);
5. Current use and local sustainability of **wa'ums** (*Oplopanax horridus* - devil's club), a traditional medicinal plant still very important to the Nisga'a (Chapter 5); and
6. An interpretative comparison of plant knowledge and use in the past, today and in the future (Chapter 6).

1.3. Why Document Nisga'a Traditional Plant Knowledge?

The importance and urgency of documenting traditional knowledge of indigenous peoples around the world should not be underestimated in our fast-paced global economy. Many non-indigenous people from all walks of life now believe that traditional knowledge (especially in relation to land management) has an important role to play in developing sustainable conservation values and resource management policies (Turner 2005; Berkes 2012). Some researchers suggest that such traditional knowledge may even be critical to the well-being of humankind as we struggle to cope with the loss of both cultural diversity and biological diversity (Battiste and Henderson 2000; Gadgil et al. 2003; Turner and Berkes 2006). Although there is a tendency, on the part of some, to glorify all indigenous traditions as "pure and noble" and without fault or error (Redford 1991; Durning 1992), there is now a more balanced view of indigenous land management and conservation values emerging as empirical evidence is gathered (Smith and Wishnie 2000; Berkes 2004, 2008; Turner 2005).

Compiling Nisga'a traditional plant use will preserve valuable historical and biological information for future generations, both Native and non-Native. But there are also important cultural reasons to document this knowledge. Prior to European contact, Nisga'a traditional knowledge was passed on from generation to generation orally. Each new generation learned which plants to harvest and techniques for sustainable harvesting by working alongside their parents and grandparents. Learning through oral tradition, however, does not imply that the culture was stagnant. Knowledge was passed down from generation to generation for many thousands of years, but techniques for harvesting and preparation of food, medicine, clothing and other technological goods, from spoons to canoes, were always evolving. New ideas emerged with each generation through continued experimentation, through interaction and trade with other Nations, and with increasing contact with European culture (Sim'oogit Ginwax – Abraham Davis 1995).

Today, much of what is known about Nisga'a traditional plant use is in the minds and hearts of elders, who witnessed and learned from parents and grandparents already affected by colonization. As the generation engulfed in change, the research collaborators involved in this work are recalling the use of plants from their memories as children, despite being shipped off to boarding schools where they were made to eat poor quality western food and speak English. Consequently, some of the detail, especially with respect to traditional plant harvesting and preparation, is unknown today or remembered through a child's eyes.

1.4. Some Aspects of Nisga'a Culture, Lands and Language

> *"We are Nisga'a, the people who live in the Nass River Valley of northwestern British Columbia and claim it as our territory. We intend to live here forever...The river and its watershed, from glacial headwaters to Pacific estuary provided the food, fur, tools, plants, medicine, timber, and fuel that enabled us to develop one of the most sophisticated cultures in North America. Since the last great Ice Age we traveled, fished and settled along all 380 kilometres of the river and its tributaries...We still hunt, fish, and trap. But today we are also lawyers, administrators, politicians, priests, teachers, linguists, loggers, commercial fishermen, carvers, dancers, nurses, architects, technicians, and business people.* (Sim'oogit 'Wii Lisims – Dr. Frank Calder 1993).

1.4.1. Geographical Location

The Nisga'a claim the entire **K'alii-aksim Lisims** (Nass River) watershed (~25,000 sq km) as their traditional territory (Nisga'a Tribal Council 1993). **K'alii-aksim Lisims** is approximately 380 km long from its source at Nass Lake to tidewater just below Laxgaltsap (Department of Energy, Mines and Resources 1989, National Resources Canada 2010). The traditional territory ranges from approximately 54.45^{o} to 56.43^{o} North and 128.46^{o} to 130.46^{o} West (Figure 1.1).[2] It encompasses both coastal and inland areas, ranging from sea level to alpine areas over 2600 m above sea level. This

[2] Latitude/Longitudes were estimated based on the boundaries drawn in the Sovereign Indigenous Nations Territorial Boundaries published by the Union of BC Indian Chiefs – June 1993. Available at: http://www.gov.bc.ca/arr/attachments/implementing_the_new_relationship_0309.pdf

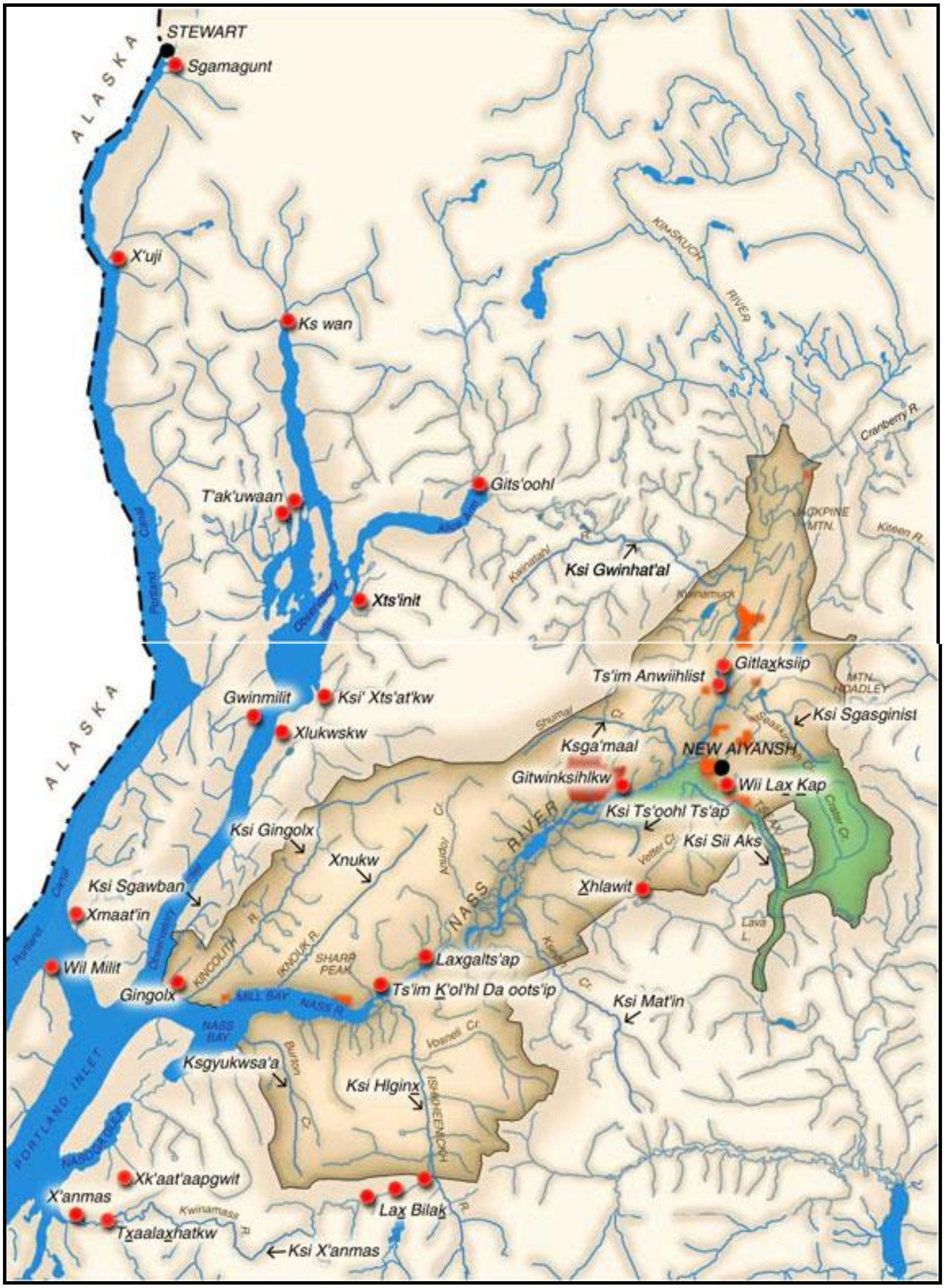

Figure 1.1. Map showing Nisga'a traditional territory and core lands as defined in the Nisga'a treaty. (Map used with permission from the Intellectual Property Program, Canada Ministry of Labour and Citizens Service, File No. 720002445).

area is very diverse, with a full range of biogeographical features including forests, coastal fiords, volcanic lava and glacial ice (Nisga’a Tribal Council 1993). The volcanic lava present on Nisga’a traditional territory is from the **wil ksi-baxhl mihl**[3] (volcano) that erupted most recently around 250 years ago. The extent of Nisga’a traditional territory has been fluid over time as boundaries changed for political and social reasons (Nisga’a Tribal Council 1995 Vol. IV; Sterritt et al. 1998; Anderson and Halpin 2000; Marsden 2000).

1.4.2. Nisga’a Society

The Nisga’a have lived for thousands of years in the Nass River Valley (Cybulski 1992; Nisga’a Tribal Council 1995 Volumes I-IV; Marsden 2000). The history of their origin and their lives in the area is recounted in their **adaawak** (stories or oral histories); these **adaawak** belong to all Nisga’a (Nisga’a Tribal Council 1995 Vol. 1; Boston et al. 1996). The rules upon which Nisga’a society is governed are based on the ancient **Ayuuk**, the laws and customs of the Nisga'a people. The **Ayuukhl Nisga’a** foster respect for the natural world and the wisdom of the elders and remain the guiding principles of the Nisga’a in the modern world (Nisga’a Lisims Government n.d.).

The Nisga’a are a matrilineal[4] society divided into four exogamous[5] **pdeek** (tribes or clans): **Laxgibuu** (Wolf), **Laxsgiik** (Eagle), **Ganada** (Raven) and **Gisk’aast** (Killerwhale). Each **pdeek** is headed up by a **Sim’oogit** (hereditary chief), and **Sigidimnak’** (matriarch). The person who is the head **Sim’oogit** of each **pdeek** is the man who is thought to have the most authority in the **pdeek**. The amount of authority a **Sim’oogit** has is based on the level of respect he has gained in the community (Boston et al. 1996). Each **pdeek** has two or more major crests associated with it: **Laxgibuu –** Wolf/Bear; **Laxsgiik –** Eagle/Beaver; **Ganada** – Raven/Frog; and **Gisk’aast** – Killerwhale/Owl/Grouse. Members from each **pdeek** belong to a **wilp** (house) which is an extended family with a common female ancestor. If the extended family became large,

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[3] The word **wil ksi-baxhl mihl** translates literally to “where the fire came out” (First Voices available at: www.first voices.com).

[4] A matrilineal society is based on kinship (related through blood or adoption) with the mother or female line.

[5] In anthropological terms, exogamous means to marry outside of your clan.

additional buildings called **huwilp** (plural of **wilp**) were built to house the people belonging to the original **wilp** (Griffin and Spanjer 2008). The members of the same **huwilp** share histories of their origins and crests associated with that history (Nisga'a Tribal Council 1995 Vol. II; Boston et al. 1996). Each **wilp** has a **Sim'oogit** (hereditary chief) as its head. Within each **wilp**, the wife of the **Sim'oogit** is a **Sigidimna<u>k</u>'** and the chief's eldest female relative (whether his mother, sister or niece) is also a **Sigidimna<u>k</u>'**. The wife of a **Sim'oogit** will support the chief but does not have any formal decision making power in his **wilp**.

Each **pdee<u>k</u>** and **wilp** have their own **adaawa<u>k</u>** that belong exclusively to them, and which detail the histories of place names, ownership transfer, territorial expansion, marriages and alliances with other people. These **adaawa<u>k</u>** can only be told by people who own the particular stories or their designates. In each **pdee<u>k</u>** and **wilp**, the highest title of chief is associated with a particular area within the traditional territories (Boston et al. 1996, Nyce 1998). When a **Sim'oogit** dies, succession of the title is passed down to his eldest brother or the oldest son of his eldest sister (Boston et al. 1996). This social structure remains very important today.

Historically, Nisga'a Traditional Territory was divided into 40 **ango'oskw** (traditional domains) owned by 60 **huwilp** (Wright 2002). A **wilp** was the basic economic unit in Nisga'a society. Each **wilp** had an **ango'oskw** with boundaries determined long ago by **wahlingigat** (the ancestors). Within each **ango'oskw**, there was an **ant'aahlkw** (berry and root picking place) and **ankw'ihlwil** (hunting land). It was the responsibility of each **Sim'oogit** to oversee the management of the resources within his **ango'oskw**. Such management included the regulation of harvesting, access and distribution of resources to ensure that there would be a reliable source of food for his **wilp** and **huwilp**. Each member of a **wilp** is considered a steward of the land (Nisga'a Tribal Council 1995 Vol. IV; Nyce 1998). This responsibility for and sharing of resources is part of the Nisga'a **Saytk'ilhl Wo'osim** (common bowl) philosophy and is fundamental to the Nisga'a way of life. **Saytk'ilhl Wo'osim** is a concept of fairness that still guides the Nisga'a in their decision making as a Nation and as individuals (Nisga'a Final Agreement 2001).

The boundaries of **ango'oskw** were somewhat fluid over time and changed on occasion for social and political reasons (Nisga'a Tribal Council 1995 Vol. IV; Boston et al.1996). The changes became legal when they were agreed upon and witnessed publically at feasts. In 1890, as European culture became more firmly entrenched on First Nations traditional territories throughout British Columbia, the Nisga'a formed a Nisga'a Lands Committee. In subsequent discussions among Nisga'a **Simgigat** (plural of chief) at these committee meetings, it was decided that the Nisga'a would pool their **ango'oskw** together in a common bowl in order to gain political strength while resolving the land question (Wright 2002).

1.4.3. The Nisga'a Treaty

The Nisga'a is the first Nation to sign a modern-day treaty in British Columbia, which came into effect on May 11th, 2000[6]. Since that time the Nisga'a have become models for other First Nations seeking to complete treaty negotiations with the Provincial and Federal governments. The signing of the treaty gave the Nisga'a control over what are called "core lands" and included the right to self-government. Nisga'a core lands are 2019 km^2 in extent (Figure 1.1) and include the four modern-day villages of Gitlaxt'aamiks (formerly New Aiyansh), Gitwinksihlkw (formerly Canyon City), Laxgaltsap (formerly Greenville) and Gingolx (formerly Kincolith) (Nisga'a Final Treaty 2001; Nisga'a Lisims Government 2011). The Nisga'a population totals more than 6400 people but not all Nisga'a reside in the Nass Valley. According to the last available census there were approximately 3000 people living in the Nass Valley with ~1800 living in Gitlaxt'aamiks, ~250 in Gitwinksihlkw, ~520 in Laxgaltsap and ~500 in Gingolx (Stephens 2010).

Core lands are under the control of the duly elected Nisga'a Lisims Government and the four village governments with input from a Council of Elders who represent the four communities and **pdeek** within each community (Nisga'a Lisims Government 2011). A new Council of Elders is selected every two years by the Nisga'a Executive

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[6] For more information on the treaty, please see http://www.nisgaalisims.ca/nisgaa-final-agreement and http://www.ainc-inac.gc.ca/eng/.

Committee from names put forward by each village government. The Council of Elders has a chairperson and eight regular members as well as eight alternate members (Nisga'a Nation Knowledge Network n.d.). With the signing of the May 2000 treaty, the Nisga'a Lisims Government has responsibilities in the areas of health care, education, social services, lands and resources, economic development, environmental stewardship, fisheries and wildlife and cultural heritage (Nisga'a Lisims Government n.d.).

Since the signing of the treaty, the four villages in the valley are all connected by a paved highway (Hwy. 113). The name for this highway was chosen because the Nisga'a were negotiating for their rights for 113 years before the treaty was signed. In the modern day, the Nisga'a fish for eulachon and salmon for personal use and profit, and many people hunt on an annual basis to supplement their food supply. Food and medicinal plants are harvested primarily on a casual basis but retain their cultural significance, especially for elders. People frequently move between villages in their daily lives for many different social and work activities. The feasting tradition remains an important part of Nisga'a culture. At feasts traditional food (e.g., consumption of soapberry ice-cream) is served alongside more modern fare. Many Nisga'a live in Terrace and Prince Rupert, and some commute to or from Terrace daily for work. Their primary source of manufactured goods comes from Terrace, a city located between 100 to 160 km SW of the Nass Valley villages.

1.4.4. Nisga'a Language

As one intention of this dissertation is to document the Nisga'a terms for different plant species and their uses, it is necessary to be familiar with basic aspects of the Nisga'a language especially as it relates to plants. Linguists describe Nisga'a as belonging to the Tsimshianic language family, along with the Tsimshian and Gitxsan languages (Rigsby and Kari 1987; Tarpent 1989; Anderson and Halpin 2000). Regardless of the names and hierarchical position ascribed to the several languages and dialects, it is clear that many words and grammatical practices are shared among the Nisga'a and their neighbours (Rigsby and Kari 1987).

1.4.4.1. Status of the Nisga'a Language

The 2010 Report on the status of First Nations languages in BC notes that Nisga'a is considered an endangered language with an estimated 485 fluent speakers, 207 semi-speakers[7] and 266 learners (Sigidimnak' Hagwilook'am saxwhl giis pers. comm. Oct. 2011)[8]. The number of language learners has been gradually increasing since 1975 with the creation of Nass Valley School District #92. In 1974 several Nisga'a leaders, recognizing the lack of cultural relevance in their current education system, presented a brief entitled "A Bilingual-Bicultural Curriculum for the Children of the Nass Valley" to the BC Minister of Education. One of the points in the brief addressed the importance of including Nisga'a language and culture as part of their regular curriculum. Subsequently, the BC provincial cabinet introduced a bill that was passed by the BC Legislature, the School District was created, and the Nisga'a language became part of the curriculum at all levels in September 1975 (McKay and McKay 1994). Today Nisga'a is taught in Head Start programs, at the pre-school level, at the elementary schools in each village, and at the high school in Gitlaxt'aamiks. It is also offered at WWNI, the post-secondary university-college associated with the University of Northern British Columbia, as well as through First Voices[9], which provides a series of web-based tools and services designed to support First Nations in archiving and teaching their language.

1.4.4.2. The Nisga'a Alphabet

The Nisga'a written language system was devised by linguist Bruce Rigsby in 1973 and refined by linguist Marie-Lucie Tarpent (in McKay et al. 1986). It is based on the alphabetic principle, which means that each sound in the language has its own letter or combination of letters. The Nisga'a alphabet does not include the letters "f", "r", "v" and "z" found in the English alphabet, and it portrays a number of sounds not common in English. It contains 46 characters (Appendix A).

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[7] A semi-speaker is someone who can speak and understand the language to a certain degree but has less language ability than a fluent speaker.
[8] More information on population is available at: http://www.fphlcc.ca/downloads/2010-report-on-the-status-of-bc-first-nations-languages.pdf
[9] More information on the First Voices language recovery initiative is available at: www.firstvoices.com

The Nisga'a language includes hard and soft consonants. Hard or glottalized consonants make a popping or exploding sound that is often difficult for native English speakers to reproduce. In Nisga'a, hard consonants are indicated by the use of an apostrophe after the letters "**k'**", "**kw'**", "**p'**", "**t'**", "**tl'**" and "**ts'**" or by placing an accent above the letters "**ĺ**", "**ḿ**", "**ń**", "**ẃ**" and "**ý**" . These are called glottalized or explosive sounds by linguists. An apostrophe is also used to indicate a hard glottal sound or stop. For example, the apostrophe in **niye'e** (grandfather) or **ya'a** (spring salmon) represents a glottal stop. An English equivalent of a glottal stop would be represented by the hyphen in the exclamation "uh-oh".

Several unique "**g**" and "**k**" sounds occur in Nisga'a. There are hard and soft front sounds represented by these letters. Soft sounds are represented by the letter alone as in the soft front sound represented by the letter "**k**" in **ts'ak** (to go out or to be extinguished) or the soft back sound represented by an underlined letter such as in the soft back sound in **ts'a<u>k</u>** (nose). There are also hard front and back sounds. Hard front sounds are represented by an apostrophe after the letter as in **ts'ak'** (dish); hard back sounds have an underlined letter as well as an apostrophe after the letter, as in **ts'a<u>k</u>'** (clam). The complexity of the sounds in Nisga'a and the importance of correct notation when writing and speaking Nisga'a is obvious considering the similarities in the words noted above. The different sounds represented by Nisga'a "**k**", "**<u>k</u>**", "**k'**" and "**<u>k</u>'**" are subtle. Such subtle sound distinctions also occur in English, as in the "p" in "pet" and the "b" in "bet".

Nisga'a has three "h"-like sounds. One of them is similar to English words, as in "hair" and found in Nisga'a in words like **ha'am wil** (resources). The two other "**h**" sounds are not found in English and are represented by the letter "**x**" because of their similarity to the sound of the classical Greek letter "**x**". There are two forms of this sound, a front[10] "**x**" as in **maaý im gilix** (blueberry) and back[11] "**<u>x</u>**" designated by underlining. The back "**<u>x</u>**" has a rougher sound as in **<u>x</u>laahl** (willow).

There are two "**l**"-like sounds. The first is similar to the English "**l**" sound, as in "like" found in the Nisga'a word **la<u>k</u>s** (needles of a conifer tree). The second Nisga'a "**l**"

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[10] A front sound is produced when the tongue tip or blade is raised in the front part of the mouth at or in front of the hard palate (Rowe and Levine 2011).
[11] A back sound is produced with the tongue body behind the hard palate (Rowe and Levine 2011).

sound is written as “**hl**”, as in **hlas’ask̲w** (edible seaweed). Both of these sounds are pronounced with the tongue in the same position but the vocal chords don’t vibrate in the **“hl”** sound.

Nisga’a vowel sounds include long and short forms. Doubling the vowel in written form indicates that the sound is drawn out and takes longer to pronounce, as in **haawak̲** (paper birch), in contrast to the single vowels in **haxwdakw** (western yew). The vowels used in Nisga’a do not necessarily sound the same as their English counterparts. The Nisga’a double vowel “**ee**” as in **seek̲s** (spruce) is pronounced <**ay**> as in the English word for “lay”; Nisga’a “**ii**” as in **giikw** (hemlock) is pronounced like the <**ie**> in the English word “field”; Nisga’a “**oo**” as in **hoon** (fish) sounds like the English <**a**> in “small” and Nisga’a “**uu**” as in **luux** (alder) sounds like the English <**oo**> as in “school” (Appendix A).

1.4.5. The Nisg̲a’a Land Management System

Management of resources to ensure sustainability was a key feature of Nisga’a culture prior to European contact and remains so today, although the management strategies have changed. In the past, the **ango’oskw** was the overall management unit or area under the leadership of a **Sim’oogit** (chief) of a particular **wilp** (house). It was the responsibility of the **Sim’oogit** to oversee the sustainable management of **ha'am wil** (resources) on his **ango’oskw** to ensure an ongoing supply of the resources needed to meet their needs. Such management might include regulating plant harvest to ensure regrowth, prohibitions against hunting a particular game species when populations were dwindling, or fall burning of berry patches to increase vigour and berry production (Nisg̲a’a Tribal Council Vol IV. 1995; McNeary 1976 pg. 113).

Controlled burning of berry patches to enhance berry production was practiced by the Nisg̲a’a and many other First Nations long before western researchers evaluated the process (Johnson 1994; Turner 1999; Williams 2003; Trusler 2002). Research has shown that burning berry bushes encourages the growth of new shoots (Van Hoefs and Shay 1981) that have a higher ratio of flower buds to leaf buds (Hall et al. 1972), resulting in higher berry production. Such periodic burning by the Nisga’a and other First Nations is an excellent example of resource management based on detailed knowledge. It demonstrates an understanding of seasonal plant growth and development, ecological processes, plant competition and succession, the effects of burning and how it leads to increased berry production (Johnson 1994; Turner 1999; Johnson 2000).

It is interesting to note that **lax̱-mihl** (place of fire) is the Nisga'a word for the lava beds on their traditional territory, and that Johnson (2000) gives a similar Gitxsan word "**lax̱'anmihl**" for "burned over area". Johnson suggests that this term can be interpreted to be equivalent to immature vegetation or a seral (successional, temporary post-disturbance) ecological condition. Using this reasoning, the term **lax̱-mihl** for lava beds could be interpreted to be equivalent to a fire-initiated bare area, but distinct from a burnt forest, and thus a place of primary succession or ecosystem development on barren ground.

1.4.5.1. Nisg̱a'a Land Management in the Modern Day

Nisg̱a'a core lands are managed by the Nisg̱a'a Lisims Government, which is dedicated to the sustainable management of their resources in the modern world. The Nisg̱a'a also have consultation rights and environmental assessment rights with respect to any proposed developments and resource extraction on their traditional territory (Nisg̱a'a Lisims Government 2009). Although times have changed for the Nisg̱a'a, the spirit and ideals of **ango'oskw** help to inform ideals and plans when considering resource management today.

With the signing of the Nisg̱a'a Treaty, many of the original Nisg̱a'a place names that had been given English names were reinstated and officially recognized. The Nisg̱a'a names are displayed on road signs, maps and are officially recognized on the British Columbia Geographic Names data base (Nisg̱a'a Final Agreement 2001).

1.5. Discussion

As the title of this dissertation suggests, the Nisg̱a'a have a long tradition of plant use that continues today, despite the monumental changes thrust upon them since first contact. For thousands of years, their ancestors sustained themselves physically, socially, intellectually and spiritually through the use of plants and other resources on their traditional territory and through trade with their immediate neighbours and beyond (Nisga'a Tribal Council Vol. I-IV 1995; Marsden et al. 2002; Daly 2005). In the late eighteenth century, after centuries of living sustainably and cooperatively on their traditional territories, the lives of the Nisga'a and their neighbours began to change with the coming of white fur traders drawn to the Northwest Coast by a lucrative fur trade (Ellis 1782; Dmytryshyn et al. 1988; MacDonald 1989; Raunet 1996).

Initially this early contact is said to have had little impact on traditional lifestyles because First Nations were skilled and experienced traders. Coastal Nations had been trading for centuries with First Nations from the Interior and they simply expanded their trading patterns to include their new white trading partners (Marsden and Galois 1995; Turner and Loewen 1998). The Nisga'a were immediately recognized as shrewd traders. Captain George Vancouver noted in 1798 that the Nisga'a were not willing to trade furs for beads and trinkets and felt that ”... neither cloth, iron, copper nor anything we had was in their opinions sufficient in quantity to the value of their skins...”(Raunet 1996). As the fur trade became established, interior peoples continued to trade furs with coastal peoples who then traded them to Europeans (BC Archives n.d.). Similarly, further north, the Tlingit and Haida were said to control the trade with the Russians and other western traders, acting as middlemen for the white traders (Karamanski 1983; Gibson 1992).

Despite their trading skills, contact with the colonizing European culture marked the beginning of irreversible change in the lives of the Nisga'a and their neighbours. As time passed, the fur trade and other commercial opportunities lured more outsiders to northwestern British Columbia. Missionaries and their families and early settlers soon began to arrive and brought not only their cultural values but also new trade goods that included foods, tools, medicines, and weapons. Ultimately, the influx of white people, arriving with different values, motives, lifestyles and diseases, changed forever the lives of all of the indigenous peoples they encountered. For the Nisga'a and other First Nations, there was a slow but steady increase in dependence on goods external to traditional lifestyles (Turner and Turner 2008).

In the approximately 250 years since first contact with Europeans, dependence on plants has shifted from harvesting wild plants out of necessity to that of harvesting as a recreational and culturally reinforcing activity. As with all First Nations, the impact of this intense contact has compromised the cultural traditions of the Nisga'a. Nonetheless, cultural tradtions continue to be an important part of Nisga'a life. Feasts are held regularly and many people fish, hunt and gather food from the forest and the sea to feed themselves throughout the year. Some use traditional medicines to treat medical conditions and many people carve with wood as their ancestors did.

1.6. Conclusion

The Nisga'a are a vibrant culture, with a rich history in which culture and use of the resources available to them are deeply intertwined. Traditional knowledge, language, and customs (almost lost since first contact) are now actively being recorded; interest and recovery is on the upswing. The communities are dynamic and evolving creative ways to record their culture and history and make it available to all Nisga'a and to the rest of the world. Language is taught at all levels from Headstart programs to the university level and is available online. A new museum records their past in a stunning visual display of artifacts recently returned to the community (Grandison 2011). At the same time, ancient feasting traditions are an important part of maintaining their link to the past and are an important aspect of Nisga'a cultural life. With growing recognition of the need for sustainability, food security, and healthy living, traditional knowledge is as relevant now as in the past (perhaps even more so).

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Chapter 2

Ethnobotany of the Nisga'a

Figure 2.1. Sim'oogit Ni'isjoohl (Horace Stevens) examining plants.

I'm very glad you have come to ask questions about plants because it's being lost now... in our days, all the plants were used (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

2.1. Introduction

The primary purpose of this chapter is to compile the ethnobotanical knowledge shared by living Nisga'a citizens, along with the written information that currently exists, in order to document as much information as possible about Nisga'a traditional plant knowledge. The information presented on a species by species basis is drawn from collaborative open-ended interaction with Nisga'a citizens as well as archival and published literature.

2.1.1. Ecological context

Nisga'a traditional territory is found within the Pacific Maritime ecozone on the North Coast of British Columbia (Wiken 1986). The biogeoclimatic zones (defined in terms of their climax tree species) found in this region include Coastal Western Hemlock (CWH), Interior Cedar-Hemlock (ICH), Mountain Hemlock (MH), Engelmann Spruce-Subalpine Fir (ESSF), Boreal Altai Fescue Alpine (BAFA), and Coastal Mountain-heather Alpine (CMA) zones (Banner et al. 1983, Government of British Columbia 2012).

There are approximately 450 vascular plant species in the lower Nass drainage[1]: 17 trees, 63 shrubs, 61 grasses and grass-like plants, 267 flowering herbs, and 43 ferns and fern allies[2]. There are also many species of bryophytes and fungi (which have not been tallied) and an exceedingly rich lichen community (>250 species), especially on the lava beds, including some species rare in Canada (Trevor Goward pers. comm. 2010).

2.1.2. Historical documentation of traditional knowledge

Plant resources available to First Nations in northwestern[3] British Columbia (BC) have remained essentially unchanged for most of the post-glacial era. Evidence through early

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[1] This estimate for the lower Nass drainage includes the area south and west of the Bell-Irving River and Bowser Lake, including Alice Arm and the Stewart area.

[2] This estimate was made by examining the collection maps found in Volume 8 of the Illustrated Flora of British Columbia (Douglas et al. 2002) and E-Flora BC (www.geog.ubc.ca/biodiversity/eflora/). Counting those distributional records was further aided by personal observations and plant collections made on Nisga'a traditional territory.

[3] Northwestern nations are considered in this work to be those whose territories extend within the area of latitudes 52^{o} to 60^{o} N to longitudes 126^{o} to 136^{o} W, corresponding approximately from the southern tip of Haida Gwaii north to the BC/Yukon border, and west of the divide between the Skeena and Fraser River drainages between Burns Lake and Houston.

historical surveys and pollen records suggest that although there were climate fluctuations the forest composition has remained essentially unchanged throughout the Holocene (Whitford and Craig 1918; Banner et al. 1983; Friesen 1985). Over the centuries, disturbances have necessitated a relocation of some villages and campsites. In addition, year-to-year variation in weather has undoubtedly resulted in variable berry crops and plant growth, as well as in hunting success and returns of fish such as eulachon and salmon. Despite this natural range of variability, the resources available to northwestern coastal First Nations have been relatively stable. The earliest written records of plant use by indigenous peoples, in what is now known as British Columbia began aboard the ships of European explorers in the late eighteenth century. Naturalists and/or botanists travelling aboard their ships, often as surgeons or assistant surgeons, described the “Indians” they met and the abundant vegetation in the area. William Ellis, assistant surgeon travelling with Captain James Cook on his third voyage, describes the general use of trees, berries and other plants by the Indians, as well as their songs and dances (Ellis 1782). Archibald Menzies, naturalist and surgeon travelling with Captain George Vancouver on the ship “Discovery,” was instructed by the British government to make note of the scientific terms for “trees, shrubs, plants, grasses as well as those used in the languages of the natives...” (Menzies 1790-1794; Menzies et al. 1923). Although Menzies’ journal entries are not usually detailed with reference to the use of plants by Indigenous Peoples, they are valuable because they provide information on the vegetation of that time and are among the first written records of plant use by First Peoples in British Columbia.

By the beginning of the 19th century the fur trade was expanding into British Columbia. Hudson Bay Company forts were being established up and down the coast, and missionaries, researchers and early white settlers were regularly travelling throughout the area. Records from this time are more detailed with respect to the different First Nations, although the references to plant use are usually general in nature (Ogden 1834; Mansen 1832, 1835; Simpson 1872; Woods 1880).

As the 19th century came to a close, knowledge was increasingly widespread that there were many different Nations with unique cultural traditions living throughout the region. Areas were mapped and travel became easier. Consequently, geologists, botanists, and anthropologists, as well as missionaries and settlers, travelled more freely throughout the Northwest Coast. People were becoming familiar with the flora, permitting a more systematic and scholarly documentation of species identity, traditional plant use and cultural traditions of the different nations living in the area (e.g., Swan 1857; Newcombe 1890-1923; Dawson 1890; Macoun 1890; Poudrier 1891; Morice 1904; Smith 1929, Smith et al. 1997; Emmons 1991). The work of these early researchers provided templates for future ethnobotanical research (Turner 1995a).

By the second half of the twentieth century, the systematic study of traditional plant knowledge was well established (Turner and Bell 1971, 1973; Turner 1974; 2004a; Albright 1982; Turner et al.. 1983, 1990; Turner and Efrat 1982; Gottesfeld 1992a,b, Johnson-Gottesfeld 1994; Compton 1993; Turner and Thompson 2006; and others). Over the last 40 years, people from northwestern First Nations have collaborated with many researchers to record traditional plant knowledge and other ethnographic information specific to their people. These efforts resulted in ethnobotanical documentation of plant knowledge for the Haida (Turner 1974, 2004a); Gitxsan (People of 'Ksan 1980; Gottesfeld 1992a, Johnson-Gottesfeld 1994; Johnson 2006; Smith et al. 1997); Nisga'a (McNeary 1974a, 1976; Nisga'a Tribal Council 1995; Mackin 2004); Tahltan (Albright 1981, 1982, 1984); Tlingit (Krause 1956); Tsimshian (J. McDonald 1984, 2003; Compton 1993; Turner and Campbell 2005; Downs 2006; Turner and Thompson 2006; Thompson 2007) and Wit'suwit'en (Johnson-Gottesfeld 1994). These nations are all neighbours and trading partners of each other and the information contained in the records provides a point of comparison for Nisga'a ethnobotanical knowledge, since many plant species are common to many northwestern traditional territories.

2.1.3. Recording Knowledge Specific to the Nisg̱a'a

Like all northwestern First Nations, the Nisga'a have a long tradition of using plants for food, medicine, spiritual and technological purposes (Nisga'a Tribal Council 1995; Volumes I-IV). Although there are some references to Nisga'a plant knowledge in the existing literature (see McNeary 1976; Pojar and McKinnon 1994; Nisga'a Tribal

Council Vol. I-IV 1995; Mackin 2004), to date there has not been a comprehensive, orderly compilation of such knowledge.

Over the last 40 years many researchers, both Nisga’a and non-Nisga’a, have documented research on a variety of topics related to the Nisga’a and their rich cultural traditions (e.g., Social and Economic Life of the Niska (McNeary 1976); Nisga’a Grammar and Language (McKay et al. 1986; Tarpent 1989, Williams 2006); Nisga’a Origins, Nisga’a Clan Histories, Nisga’a Society, Nisga’a Land and Resources (Nisga’a Tribal Council 1995 Vol. I-IV; Boston, et al. 1996); and Nisga’a Landscape and Architecture (Mackin 2004)). While these works contain some information related to plants and their cultural importance to the Nisga’a, their central focus is not geared toward ethnobotanical research. In 1993, as the Nisga’a moved toward signing the first modernday treaty in Canada (see Chapter 1), a fully accredited university college, Wilp Wilx̲o'oskwhl Nisga'a Institute (WWNI; “Nisga’a House of Wisdom”) was established in Gitlax̲t'aamiks (called New Aiyansh in English) by the Nisga’a. This institution recognized the urgency of preserving all aspects of Nisga’a cultural history while supporting collaborative research between Nisga’a and non-Nisga’a. The WWNI leadership understood where there are gaps in knowledge that need to be filled, and a complete ethnobotany of the Nisga’a fit into this category.

2.2. Methods

Not all plant and fungus species found in the Nass drainage were culturally important to the Nisga’a, but over time the Nisga’a had developed names and uses for many of those species found on their traditional territory. To identify species suitable for discussion with collaborators, four approaches were undertaken:

1. Reviewing archival records and other written sources for information related to use of plants by First Nations in BC, and specifically by the Nisga’a;
2. Reviewing field surveys; and species lists compiled by others who have worked with the Nisga’a in the Nass Valley (McNeary 1976; Turner 2004b, 2010);

3. Conducting personal field surveys and collecting plant species occurring on Nisga'a traditional territory; and
4. Collaborating with Nisga'a elders and other Nisga'a citizens to record their recollections related to plant names and traditional plant knowledge.

2.2.1. *Reviewing Existing Written Information*

Three sources were used to find information relevant to Nisga'a plant knowledge:

- Archival documents relating to plant knowledge and other cultural traditions of the Nisga'a, other First Nations in northwestern BC and indigenous peoples around the world;
- Current academic literature relating to plant knowledge and cultural traditions of northwestern First Nations in BC and indigenous peoples around the world; and
- Current academic literature relating specifically to the Nisga'a.

2.2.1.1. *Review of Archival Records*

Archival records related to First Nations in general, and the Nisga'a in particular, were systematically reviewed at:

- the Hudson Bay Company Archives (Winnipeg, Manitoba);
- the BC Archives housed at the Royal BC Museum (Victoria, BC);
- Library and Archives Canada (Ottawa, Ontario);
- the Canadian Museum of Civilization archives (Gatineau, Quebec);
- the McPherson library of the University of Victoria (Victoria, BC); and
- the Geoffrey R. Weller library of the University of Northern British Columbia (Prince George, BC).

Archival materials include the journals of early explorers and of botanists, naturalists, and surgeons in their employ (Ellis 1782; Menzies 1790-94; Vancouver 1984; Newcombe 1890-1923), and reports of Hudson Bay Company traders and chief factors (Simpson 1828; Manson 1832; Ogden 1834). The journals of private citizens, and journals, reports and books of missionaries, early researchers and academics were also consulted (Woods 1880; Boas 1889, 1894; Newcombe 1890-1923; Morice 1904; Arctander 1909; Collison 1915; Moeran 1923; Smith 1926, 1929; Patterson 1982).

2.2.1.2. *Review of Recent Academic Literature*

Recent academic ethnobotanical, ethnographic and anthropological works related to First Nations in northwestern BC were reviewed to look for any reference to plant knowledge by peoples of the Northwest. These sources included works by:

- Albright 1981,1982, 1984; Thompson 2007; Edōsdi 2012 – Tahltan;
- Seguin 1984; Miller 1997; Marsden 1995; Compton 1993[4]; McDonald 2003; Daly 2005; Downs 2006; Turner and Thompson 2006 --Tsimshian;
- Smith et al. 1997; People of 'Ksan 1980; Gottesfeld 1992a; Gottesfeld and Anderson 1988; Johnson 1999, 2000; – Gitxsan;
- Turner 1974, 2004a; Norton 1982; – Haida.
- Krause 1956; Emmons 1991; Thornton 1999; – Tlingit

Academic literature was reviewed to look for reference to ethnobotanical information by any peoples living in close contact with the land; principal sources included Moerman 2002, 2009 (North America), Symons and Symons 1994 (Australia), Krauss 1977 and McBride 1975 (Hawaii). Information with respect to traditional knowledge of the same plant species (or species of the same genus or plant family) as those found on traditional Nisga'a territory was noted.

2.2.1.3. *Review of Literature Specific to the Nisga'a*

Works written and compiled by Nisga researchers were reviewed to note the names, uses and knowledge of different plants (see Nisga'a Tribal Council 1995, Vols. I-IV; Boston et al. 1996; McKay et.al. 2001; Williams 2006). The four Tribal Council volumes (1995, Vols. I-IV), entitled "Origin Stories," "Clan Histories," "Traditional Land Management" and "Nisga'a Society," frequently mention the role of plants while describing other aspects of Nisga'a culture. Such references include plants used for spiritual purposes, rights of access to territory for the purpose of plant harvest, plant names for different

[4] Kitasoo – Southern Tsimshian

places, gathering food for storage, land management traditions and plants as a basis for trade. Nisga'a dictionaries and phrase books also provided important information on plant names, plant preparation and plant use (McKay et al. 1986, 2001; Williams 2006). Work by non-Nisga'a researchers, undertaken in collaboration with Nisga'a government or educational authorities (McNeary 1976; Corsiglia 1988; Tarpent 1989; Cybulski 1992; Mackin 2004) was also consulted. Since plant use was integral to the Nisga'a way of life, references to plants and their uses were found in many of these publications though detail was often lacking.

2.2.2. *Floristic Field Surveys*

I visited as many areas as possible on Nisga'a territory to compile a personal list of plants (Appendix B). Since the vegetation in the Nass has been relatively constant over time (Banner et al. 1983; Friesen 1985), documenting the presence of plants currently found on Nisga'a territory provided a plausible link to their traditional use and served as a basis for discussing various particular plant species during oral interviews. During these field excursions, photographs of many species were taken and/or voucher specimens collected to verify identification and for use in the oral interviews that were to follow. Over 100 voucher specimens were collected from 2006 to 2010 (Appendix B).

2.2.3. *Documenting Nisg̲a'a Plant Knowledge Through Open-ended Interviews*

Gathering oral information consisted of preparatory work (including research and ethics approvals), indoor one-on-one recorded discussions, field trips where discussions were recorded or later transcribed into a research journal, group situations after which discussion was transcribed from notes taken during the discussion, and incidental personal meetings.

2.2.3.1. *Preparatory Work*

As stipulated in the acceptance of the proposal to document Nisga'a traditional plant knowledge, Sigidimnak̲' K'yaks Sgiihl Anluuhlkw Psday (Deanna Nyce) of the WWNI provided guidelines for a research protocol in the Nisga'a community. She also suggested names of potential contacts and arranged for initial introductions to two elders. In keeping with the principles of community-based research (Kirby and McKenna 1989; Battiste and Henderson 2000; Strand et al. 2003; Smith 2005), I undertook to spend a significant amount of time with the Nisga'a on their traditional territory. I lived in each of the four villages – Gitlax̱t'aamiks (English name, New Aiyansh), Gitwinksihlkw (English name, Canyon City), Lax̱g̱altsap (English name, Greenville), and Gingolx (English name, Kincolith) for periods ranging from 3 weeks to 3 months during the active research period (2007 to 2009). In addition, from September to April in 2007 and 2008, I visited the Nass Valley ("the Nass") on a monthly basis to take language classes, attend feasts and tribal picnics, and to visit with friends. Through this continuous contact, I was able to feel comfortable in the community and was recognized and welcomed by many as they came to understand the purpose of my work. Throughout the research period, I was encouraged to take part in the preparation of traditional foods and attempts were made to teach me how to string eulachons, clean, cut and smoke fish, and keep the fire going in the smokehouse. My "home" village has become Gitwinksihlkw and when I return to the Nass now, I am welcomed as an "itinerant resident."

2.2.3.2. *One-on-one Discussions*

One-on-one open-ended discussion about plants and associated topics was the primary method for the collection of information. This technique was used to encourage full, meaningful conversation that called upon the personal knowledge and/or feelings of each collaborator. Open-ended discussions tend to be more objective and less leading than close-ended questioning (as used in questionnaires) and so support discovery of new information by asking about perceptions, opinions, feelings and general knowledge (Charmaz 2003), in this case centering around plants. Fresh plant specimens, pressed plant specimens, or digital photographs of plants shown on a laptop computer were used as an aid to initiate discussion with research collaborators.

Information obtained through recorded open-ended interviews allows an individual to express and expand upon in-depth knowledge with less researcher bias (Patton 2002). For example, saying "Tell me what you remember about devil's club" as opposed to asking a leading question like "Did you use devil's club to make medicine from the leaves or bark?" facilitates discussion rather than a "yes" or "no" answer.

2.2.3.3. *Research Collaborators*

Each prospective research collaborator was first contacted by phone to briefly discuss the scope of the project. From these phone contacts a convenient time and place was arranged for an introductory meeting. At the first meeting, the scope of the project was discussed in more detail and a letter of informed consent, approved by the Human Research Ethics Board at the University of Victoria, was reviewed and signed. In each case, permission to make a digital audio recording of the interviews was discussed and subsequently granted, with the understanding that the digital recorder would be turned off upon request and that the interview could be terminated upon request. It was explained that a typed copy of any recorded interviews would be returned as soon as possible for review and revision.

All but two of the collaborators were born between 1925 and 1947 and had learned Nisga'a cultural traditions from their parents and grandparents, while being introduced to a world dominated by western food, language and religion. The oldest collaborators learned Nisga'a as their first language but all were fluent in reading and writing English. All but one elder attended residential school at an age when young people traditionally would have been learning from their parents and grandparents. An important point regarding their recollections is that all of the collaborators were recalling most practises from their perspective and memories as children. They often recalled watching their mothers or grandmothers gather and prepare traditional plant foods and medicines, but in general, did not do so themselves. One elder recalled:

> *I remember seeing my grandmother gather the medicine, but I was just a kid and I didn't pay too much attention to what she was doing with it.* (Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008).

Over the four-year period, 35 one-on-one open-ended discussions were recorded with 23 Nisga'a citizens: 12 women and 11 men, all permanently residing in one of the four modern-day Nisga'a villages. Twenty-one individuals were elders between the ages of 60 and 87, and two were males aged 25 and 50 years old. The youngest male was an incidental participant, in that he briefly took part in a discussion while his grandmother was being interviewed. In keeping with their ancient cultural traditions, each person belongs to one of the four Nisga'a **pdeek̲**: **Lax̲gibuu** (wolf), **Lax̲sgiik** (eagle), **G̲anada** (raven), or **Gisk̲'aast** (killerwhale), with clan membership handed down through the mother (see Chapter 1). Table 2-1 gives the names of research collaborators, their **pdeek̲**, their home village and the number of open-ended interviews in which they participated.

Transcribed interviews were delivered personally or by mail to each collaborator between one week and three months after the interview, with a covering letter asking that the information be reviewed to make changes, deletions or additions, where necessary. People were later contacted again by phone or in person to see if they wanted to make changes to the information as transcribed. Collaborators were paid $25.00 per hour for their time. In addition, a small gift was presented to each elder at one-on-one meetings as a sign of friendship, respect and gratitude.

2.2.3.4. *Field Trip Discussions*

A total of 16 field trips were undertaken individually with three collaborators, Sigidimnak̲' K'igapks (Alice Azak), Sigidimnak̲' Hagwilook̲'am saxwhl giis (Irene Seguin) and Jeff Benson (Table 2.1). Field excursions with Sigidimnak̲' K'igapks and Sigidimnak̲' Hagwilook̲'am saxwhl giis were taken both to find and discuss plants in general as species were encountered, or to look for a specific plant with opportunistic discussion as other species were encountered. A single field trip with Jeff Benson was undertaken specifically to find and discuss **wa'ums** (devil's club – *Oplopanax horridus*). Conversations during these field excursions were recorded where possible and later transcribed. When it was not convenient to make an audio recording, information was taken in note form, later written down in a research journal and subsequently verified through discussion.

2.2.3.5. *Group Meetings*

Information was also gathered in conjunction with two WWNI Board of Directors meetings and two WWNI post-secondary classes where elders were invited as consultants. Information was gathered in the form of notes taken, with permission, during the meetings. Typically, these meetings involved spontaneous open-ended discussion among elders as well as with others in attendance. In one instance the information came from an opening speech given by Sim'oogit Hleek (Dr. Joseph Gosnell) at the beginning of a WWNI class. Such group meetings often stimulated more recollections and details than one-on-one discussions.

Through all three approaches, a total of 62 contacts occurred, resulting in data on 149 plant taxa (Appendix C), later classified into technological, food, medicinal and spiritual uses. It is important to note that not all 149 plant taxa were discussed with every collaborator. Some people preferred to discuss only one or two plants which they knew well in an interview, while others preferred a single interview in which we were able to discuss the uses of several plants. Four people expressed an interest in meeting more than once to share their knowledge about as many plants as possible. Frequently in group meetings the discussion would focus on only one or two species but typically the discussion would branch out to include other species as the meeting progressed.

2.2.4. *Data Compilation and Analysis*

Once the various open-ended interviews were completed, four spreadsheets (one each for "food use," "medicinal use," "technological use," and "spiritual use") were created in Microsoft Excel in order to compile the oral recollections in a written and easily summarized format (Appendix D). Each of the four spreadsheets lists the names of the 23 collaborators and their recollections for a particular species under discussion. Throughout this analysis, it was considered important to record "null data" as well. That is, if a use was not recalled, or that species was not discussed, the following notations were made: "plant recognized but no use recalled," "plant not recalled," "no technological (or other categories) use recalled" or "plant not discussed."

Table 2.1. The attributes of Nisga'a research collaborators and their interviews.

Nisga'a Name	English Name	Gender	Village	Pdeek	Wilp	Private Indoor	Field	Group	Total
Axdii Ksiiskw	Grace Nelson	Female	Gingolx	Laxsgiik	Sim'oogidim Xsgaak	1	0	0	1
Sim'oogidim Sigidimnak'	Lavinia Clayton	Female	Gingolx	Laxsgiik		1	0	0	1
Gwiis Ha	Roger Watts	Male	Gingolx	Ganada		1	0	0	1
Haym̓aas	Chester Moore	Male	Gingolx	Ganada	Haym̓aas	1	0	0	1
Ni'is Naganuus	Steven Doolan	Male	Gingolx	Laxgibuu	Kw'axsuu	1	0	0	1
	Jeff Benson	Male	Gingolx	Gisk'aast	Daaxan	1	1	0	2
Alisgum Xsgaak	Diane Smith	Female	Gitwinksihlkw	Laxsgiik	Bax-K'ap	1	0	0	1
Hagwilook'am saxwhl giis	Irene Seguin	Female	Gitwinksihlkw	Laxgibuu	Bax-K'ap	1	5	0	6
Hlgu Wilksithlgum Maaksgum Hlbin	Emma Nyce	Female	Gitwinksihlkw	Laxsgiik	Hleek	1	0	2	3
Kwhligyoo	Lavinia Azak	Female	Gitwinksihlkw	Ganada		2	0	2	3
K'igapks	Alice Azak	Female	Gitwinksihlkw	Laxsgiik	Gwiix Maaw̓	3	10	3	16
Noxs W̓een	Peggy Nyce	Female	Gitwinksihlkw	Laxsgiik	Hleek	1	0	0	1
X'am̓aal	Mercy Moore	Female	Gitwinksihlkw	Laxsgiik	Laay̓	1	0	0	1
	Simon Calder	Male	Gitwinksihlkw	Laxgibuu	Laay̓	1	0	0	1
Bax-K'ap	Jacob Nyce	Male	Gitwinksihlkw	Laxgibuu	Bax-K'ap	1	0	0	1
W̓iit'ax An'un	Belinda Robinson	Female	Laxgaltsap	Ganada	Axdii Wil Luugooda	1	0	0	1
Bayt N̓eekhl	Jacob McKay	Male	Laxgaltsap	Laxsgiik	Bayt N̓eekhl	1	0	1	2
Gadim Galdoo'o	Charles Alexander	Male	Laxgaltsap	Ganada	Gadim Galdoo'o	6	0	1	7
Ni'isjoohl	Horace Stevens	Male	Laxgaltsap	Ganada	Niy̓sjoohl	1	0	0	1
Ts'aa Gabin	Verna Williams	Female	Gitlaxt'aamiks	Ganada	Ksim Xsaan	1	0	0	1
W̓ii Ts'iksna'aks	Pauline Grandison	Female	Gitlaxt'aamiks	Gisk'aast	Wisin Xbiltkw	5	0	1	6
Hleek	Joseph Gosnell	Male	Gitlaxt'aamiks	Laxsgiik	Hleek	1	0	2	3
Ksdiyaawak	George Williams	Male	Gitlaxt'aamiks	Laxgibuu	Ksdiyaawak	1	0	0	1

2.3. Results

2.3.1. *Archival Research*

The journals of sea captains, fur traders, missionaries and researchers viewed in the archives provided general information with respect to plant knowledge by First Peoples in British Columbia (Ellis 1782; Menzies 1790-94; Manson 1835; Ogden 1834; Arctander 1909; McCullagh 1883-1897 in Moeran 1923; Doolan 1864-65 in Patterson 1982; Vancouver 1984). The use of plants was not the general focus of most of these documents, but these early writings contributed to the creation of the list of candidate species for future discussion with Nisga'a collaborators. Their passing references to "berries" or "trees" were useful because they confirmed the widespread general use of different growth forms by native peoples.

As these early travellers became familiar with the area and its vegetation they did make reference to the use of individual plant species but their discussions were usually given from a European perspective and details related to plant preparation and purpose were not fully understood and/or explained. For example, anthropologists Franz Boas and Marius Barbeau each noted that western redcedar (*Thuja plicata*) was used for sails and for mats without describing how these were made (Boas 1888, 1894; Agnes Haldane in Barbeau 1958).

The journals of early geologists, botanists, and naturalists were valuable aids because they meticulously documented the presence of plant species and were dedicated to assigning names to the new specimens they encountered in travels on traditional territories throughout BC. These scientists eagerly collected plant specimens and/or drew sketches of plants, sending them back and forth to each other to exchange opinions, confirm identification and to name plants new to them (Dawson 1890; Macoun 1890; Newcombe 1890-1923, Vol. 46, Folder 18; Emmons 1991).

As scholars became familiar with the flora, they recorded more detailed ethnobotanical information. For example, Swan (1957) wrote detailed descriptions of the Makah use of common bulrush or cattail (*Typha latifolia*) for making mats, and baskets made with spruce (*Picea* sp.) roots, bear-grass (*Xerophyllum tenax*) or willow (*Salix* sp.) bark and other plant species (Swan 1857, pg. 191). Frequent correspondence occurred between geologist George Dawson, botanist John Macoun and naturalist Dr. Charles Newcombe regarding the correct identification of the species the Haida used for “Indian tobacco” (Dawson in Newcombe 1890-1923, Vol. 46, Folder 18; Turner and Taylor 1972). Subsequently, Dr. Newcombe prepared a paper entitled “Aboriginal Use of Plants on the North Pacific Coast” (Newcombe 1890-1923, Vol. 24, Folder 6). Here he named numerous species and estimated the number of plants use by First Peoples in BC to be about 117.

The limitations of the archival literature made it difficult to specifically identify Nisga’a plant knowledge. Such identification was further complicated by fact that Nisga’a, Gitxsan and Tsimshian belong to what linguists call the Tsimshianic language group (Rigsby and Kari 1987; Tarpent 1989; Gordon and Grimes 2005). Due to the language similarities, anthropologists did not always distinguish between Nisga’a, Gitxsan and Tsimshian when discussing plant knowledge (e.g., Boas 1889; Newcombe 1890-1923). Despite these limitations, the archival literature was a useful resource because it provided historical context and background for documenting Nisga’a ethnobotany.

2.3.2. *Literature Reviews*

Reviewing the detailed ethnobotanical research on First Peoples in BC undertaken over the last 80 years was useful (e.g., Smith 1929; Turner 1972, 1980, 1994; Albright 1981, 1982, 1984; Compton 1993; Gottesfeld 1992a, 1994; Smith et al. 1997; Johnson 1999, 2000; People of ‘Ksan 1980; Kari 1985, 1995). These publications contain information with respect to plant identification and naming, taxonomic categorization, and detailed information concerning harvest, preparation and use for food, medicine, technology and spiritual well-being. Many of the plant species discussed in these works occur on Nisga’a traditional territory, so were included in the list of plants for discussion with research collaborators in the Nass Valley.

2.3.3. *Results of Open-ended Interviews*

One-on-one open-ended interviews, group interactions and field trips were the richest sources of Nisga'a ethnobotanical information. The discussions were focused on Nisga'a plant knowledge and therefore the information recorded was predominantly about the ways the Nisga'a used various plant species. More than once when working with collaborators and discussing a particular plant, I was told, "this is what we did, maybe other people did it differently, but this is how the Nisga'a did it." On occasion, a collaborator might refer to a plant used by other people, but this was usually when that species was not abundant on Nisga'a territory. A male elder, who had not attended residential school, recalled the most detail about preparing plant medicines, making tools and gathering food. This result is in keeping with the comments of the other collaborators who said that they couldn't remember too much because they were sent to residential school.

The information presented here is based on the compilation of all plant use and relationships recalled by Nisga'a research collaborators during the open-ended interviews, field trips and discussions, both formal and informal. Written information supplements the oral recollections. These sources include published Nisga'a literature, archival material,[5] and historic and current academic literature.

The 149 plant taxa discussed (Appendix C) include 18 tree species; 42 shrub species; 45 herbaceous flowering species; 3 graminoids; 12 fern/fern allies; 6 bryophytes; 11 lichens; 7 fungi; and 5 algae. These numbers are similar to the numbers estimated by others (Newcombe 1890-1923, Vol. 24, Folder 6; Macnair 1975). Spellings for Nisga'a plant names are taken predominantly from Hańiimagoońisgum Algax̲hl Nisga'a (Nisga'a Dictionary – McKay et al. 2001) and/or the Nisga'a Language Student Vocabulary Guide (Ts'aa Gabin --Verna Williams 2006). When names were not in the dictionary, spellings were verified by Sigidimnak̲' Ts'aa Gabin (Verna Williams) and/or Sigidimnak̲' Hagwilook̲'am saxwhl giis (Irene Seguin) and Marie-Lucie Tarpent (pers.comm. 2009-2010). Latin nomenclature follows that used by the British Columbia Conservation Data Centre as it appears in E-Flora BC[6].

Distribution data for each species is from MacKinnon et al. (1999), Pojar and

[5] Archival material includes historical journals, Hudson Bay Fort reports, missionary reports and government reports.
[6] E-Flora BC available at: http://www.geog.ubc.ca/biodiversity/eflora/eflorintroductionpage.html

MacKinnon (1994) and E-Flora BC, unless otherwise noted. In listing the species, the Nisga'a name is given first, followed by the common name, then the scientific (Latin) name and authority. Food use, medicinal uses, spiritual/ceremonial uses and technological uses are listed for each plant.

Plants were harvested for food use throughout the year, though less so in the winter. Spring food use of plants is based primarily on the harvesting of emergent shoots of various species in the early spring, the harvesting of cambium of some conifer species and the use of roots, rhizomes, stems and leaves of various vascular plant species. Summer and fall harvesting was dominated by the collection of many berry species consumed fresh and/or dried. A few berry species were consumed on a casual basis because they were difficult to collect, too fragile to transport, or were not particularly palatable and hence were used in emergency situations only. Today berries are harvested and consumed fresh, but rather than dried, they are preserved in jars or frozen. The harvesting of **hlak'askw** (red laver – *Porphyra abbottiae*) and drying it into **p'ihl'ooskw** (dried cakes) is also considered a mid-spring activity (early May). Many Nisga'a continue to harvest and dry **hlak'askw** or trade it for other food such as **t'ilx** (eulachon grease), **digit** (smoked eulachon) or **si'u** (stringed sundried eulachons). Winter harvesting of food occurred primarily in emergency situations during the winter and in early spring and was limited to those species where berries remained on the bushes throughout the year (e.g., **sbiks** – highbush cranberry, *Viburnum edule*) or in a mild winter where edible shoots emerged unexpectedly. Where known, techniques for gathering, eating and winter storage of food products are noted.

Medicinal plant use includes the treatment and prevention of a wide range of symptoms and conditions using the roots, stems, leaves and berries of various plant species. Conditions[7] treated include abdominal disorders, arthritis/rheumatism, skin disorders[8], burns, cancer, chest conditions[9], digestive disorders, ear, nose and throat disorders, eye disorders, obstetrics and gynecological uses, miscellaneous use,

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[7] Modern medical terms were used by collaborators to describe various conditions. Such conditions would have been treated pre-contact but obviously not known by these terms.

[8] Skin disorders include boils, wounds, cuts, eczema and various other skin infections.

[9] Chest conditions include asthma, colds, coughs, bronchitis, and tuberculosis (consumption),

orthopaedic aid, tonic, sexually transmitted diseases, and unspecified use. Medicines were/are generally taken internally as decoctions, infusions or concoctions. Infusions, decoctions and concoctions were also used externally and applied as poultices, rubs or salves directly on the skin.

Decoction is defined as making a concentrate of plant parts by boiling them down in water; infusion or extraction means steeping or soaking plant parts on their own (or with other plants). Decoction and infusions are consumed internally as a tea or used externally as a body soak. A concoction is an infusion or decoction that is a mixture of two or more different plant parts or other materials. A poultice is a soft, moist mass of plant parts that is externally applied while hot to an injured or ailing part. Salves are soft, moist or viscous materials created from concentrations of plant parts and other ingredients such as oil or grease. They are rubbed externally on ailing body parts and wounds. In addition, some medicines were also simmered in water and the steam inhaled. Methods of medicinal preparation are included, when known, and if the information is not considered to be proprietary.

Spiritual use includes the use of plants and their parts for bringing good luck, driving away bad spirits, ceremonial purposes in preparation for hunting, competition, general feeling of well-being and appreciation of beauty (e.g., bringing flowers into the house because they look pretty or smell nice). The Nisga'a generally had and continue to have a spiritual appreciation and connection to plants and the respectful harvesting and use of plants remains an important part of their culture. Plants used for ceremonial purposes are included in the discussions on spiritual use.

Technological use includes the use of any part of a plant as a material for building, carving, making canoes, the manufacture of clothing, housewares, tools, weapons, vessels for preparing food and medicine, as well as for covering the human scent as an aid in hunting and fishing and air purification.

Where there was little or no information recalled or recorded for Nisga'a with respect to use of a particular species, its use by neighbouring nations is provided. In these instances, archival records, current ethnobotanies and published works of northwestern and other First Nations were consulted to see if and how those species were used or traded (Norton 1981; Emmons 1991; Marsden and Galois 1995; Turner 2004a; Daly 2005; Turner and Thompson 2006; Moerman 2002, 2009 and others). It is important to include this information because there are many species common to traditional territories and frequent contact (through trade, seasonal rounds and inter-marriage) suggests that the Nisga'a may have had similar use, not recalled or shared. More research to confirm and elaborate on how the Nisga'a may have used these plants is clearly needed to complete the story.

When a Nisga'a name is not available, a Gitxsan name is provided if it is known because the two Nations do share many common plant names (Rigsby and Kari 1987). Unless otherwise noted, the Gitxsan names come from Huwehl Gangan, 'Yens, Ganhl, Majagalee, Gyeets Ha'niimagooansxwhum Algaxhl Gitksen – The Names of the Trees, Plants and Flowers for the West (Aboriginal Curriculum Committee n.d.; Hindle and Rigsby 1973; Anonymous 1998).

Particular attention was given to documented plant use by the Haida, Tlingit, Tahltan, Tsimshian and Gitxsan because frequent contact between these nations and the Nisga'a is known to have occurred (Ogden 1834; People of 'Ksan 1980; Sim'oogit Galdoo'o – Charles Alexander 2008). One Gitxsan informant recalled that…

> *…people annually came from villages of the Tsimshian Peninsula, from Alaska, from the Queen Charlotte Islands, from the Upper and Lower Skeena and from what are now Terrace and Kitimat…to fish for eulachon…" [on the Nass, and that] "…the Nass eulachon run was undoubtedly a primary influence in unifying what is called the Northwest Indian culture. All aspects of life, art styles, songs, dances, weaving techniques, carving etc. were doubtless compared and discussed…* (People of 'Ksan 1980 pg 91).

For species where little or no Nisga'a information was available, uses by First Nations in other areas are noted to document that these plants were, in fact, used by some peoples and require further investigation into their possible use in the Northwest.

2.3.4. *Species by Species Description*

2.3.4.1. *Gangan - Trees*

Conifers

Alda (Ho'oks) – amabilis fir – *Abies amabilis* (Douglas ex Louden) Douglas ex Forbes; subalpine fir – *Abies lasiocarpa* (Hook.) Nutt. Family: Pinaceae (Pine family)

These two species are being presented together because for residents of Gitlaxt'aamiks and Gitwinksihlkw, subalpine fir is the more usual *Abies* species encountered at lower elevations (i.e., in the ICHmc2 biogeoclimatic[10] variant) while amabilis fir is encountered at higher elevations (i.e., in the CWHms2 or MHmm2 biogeoclimatic variants (Banner et al. 1993). However, for people living in Gingolx and Laxgaltsap, Pacific silver fir is equally abundant in the low elevation CWHws and the high elevation MHmm biogeoclimatic subzones found closer to those villages. Both species were known as "balsam" by many residents of these villages.

The issue of proper Nisga'a naming for *Abies* species is further complicated by use of the terms **ho'oks** for "balsam fir" (which is not found in western British Columbia) and **alda** for amabilis fir in the Nisga'a Phrase Dictionary (McKay et al. 1986), the use of **ho'oks** for "balsam" and **alda** for Douglas-fir in McKay et al. (2001) and the use of **alda** for Douglas-fir in the Nisga'a vocabulary guide (2006). These inconsistencies are understandable because, in colloquial English, the terms "fir" and "balsam" are used interchangeably for *Abies* species in BC. Furthermore, the wood products industry applies the term "fir" to denote Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, although it is not a true fir (i.e., not an *Abies* species).

Three collaborators recognized two Nisga'a names for "balsam" or *Abies* spp. One distinguished between balsam that grew "higher up" and balsam growing lower down the mountain (Sigidimnak' K'igapks – Alice Azak 2007-8). Another, when presented with a sample of each species identified the difference between the two species and knew both terms **ho'oks** and **alda**. One person recognized both the names**,** but noted that it would be difficult to tell the two apart when in the woods and was unsure of the

[10] Biogeoclimatic zones are explained more fully in Chapter 3.

difference between the two when looking at samples or photographs.

Food Use

There are few records of Nisga'a using either of these species for food. One collaborator thought that the tips of both **ho'oks** and **alda** might have been made into a refreshing tea in the spring because she recalled "the new growth of any kind of tree (conifer) was used for tea in the spring." Ne'jiits Hoostkw (Grace Azak) recalled that "...the inner bark of 'balsam', spruce and pine was eaten but not stored" (Nisga'a Tribal Council Vol. IV 1995 pg. 199).

In fact, there are few records of any northwestern First Nation using either of these species for food. Further south, the Haisla (Gottesfeld 1992a), Kitasoo (Compton 1993) and Gitga'at (Turner and Thompson 2006) ate the inner bark of Pacific silver fir.

Medicinal Use

Anti-hemorragic: In *Ayuukhl Nisga'a***,** Ginwax (Abraham Davis) recalled that **m'oots'iksa ho'oks** (pitch[11] of the "balsam" tree) was mixed with castor oil to control internal bleeding (Nisga'a Tribal Council Vol. IV 1995 pg. 88).

Anaesthetic: One person said her grandmother used **m'oots'iksa ho'oks**, mixed with other plants, as an anaesthetic before cutting out canker sores.

Chest Conditions: Three collaborators remembered that **m'oots'iksa ho'oks** was used to treat chest infections (including tuberculosis), colds, coughs and pneumonia. Sigidimnak' K'igapks – Alice Azak (2007) said she was told by her dad that the "the **m'oots'iksa ho'oks** from higher up on the mountains makes better medicine than the balsam from further down the mountain" for the treatment of tuberculosis. Sim'oogit Ginwax (Abraham Davis) also reported the pitch was mixed in a drink for treating tuberculosis (Nisga'a Tribal Councail 1991 Vol. IV). Two people recalled that **m'oots'iksa ho'oks** preparation was bitter and one of them said it was sweetened with the sap from **giikw** (western hemlock – *Tsuga heterophylla*).

Digestive Disorders: The Nisga'a phrase dictionary lists the general use of **m'oots'iksa**

[11] The terms "gum" or "sap" were sometimes used to describe pitch or resin, but these tree by-products are different. Resin is a viscous compound found in many tree species, particularly conifers, while sap is the sugar produced in the phloem of woody trees Definitions from http://www.biology-online.org/dictionary

ho'oks for digestive disorders (McKay et al. 1986).

Skin Disorders: Five collaborators recalled that warmed **m'oots'iksa ho'oks** from **ho'oks** and/or **alda** was used to draw out the pus from boils, sores and other skin infections. Sigidimnak' Hlgu Wilksithlgum Maaksgum Hlbin – Emma Nyce (2008) said that her mom used to mix the seeds of **k'alams** (*Rosa nutkana*) with the warmed **m'oots'iksa ho'oks** and apply it to boils, then cover it with brown paper as a poultice to draw out the pus. Sigidimnak' Kwhligyoo – Lavinia Azak (2010) recalled **m'oots'iksa ho'oks** being mixed with its needles and covered with brown paper to draw out the pus. Several people said that when the wound was free of pus, pitch was applied again until the boil or wound was healed.

Tonic: One person recalled that the pitch from trees 40 to 50 years old was used as a spring tonic and another remembered her grandmother preparing tea with the new growth of most conifers "to purify your system."

Additional Information: Sim'oogit Gadim Galdoo'o (Charles Alexander) provided the following detail on preparing resin for medicinal use:

> *The oozing resin beads were called* **m'oots'iksa ho'oks** *(balsam nipples) on the bark of forty to fifty year old trees ... are chopped off with an axe and placed in a bag to be transported home, where they are soaked in water and used for different medicines. You do not take too much off each tree and you chop off the resin from the north side of the tree because taking the resin from the other side would cause the tree to dry up and die. Once the resin is in the pot, you don't boil it, but you leave it in long enough so that when it it's hot you can nick it with a knife and let the oil come out of it. That's the real medicine* (2008).

He further explained that:

> ***M'oots'iksa ho'oks*** *was one of the most powerful Nisga'a medicines and was often mixed with other medicine like roots of* ***wa'ums*** *(devil's club) or* ***haxwdakw*** *(western yew) to make a variety of medicines and that how a mixture was prepared depended not*

> *only upon the illness but upon the person being treated. Medicinal preparations were adjusted depending upon the response of an individual* (2008).

Spiritual/Ceremonial Use

No information was reported or recorded[12] for a Nisga'a spiritual use of either **ho'oks** or **alda.** However, based on Sim'oogit Gadim Galdoo'o's (Charles Alexander) description of harvesting **m'oots'iksa ho'oks,** it is evident that there is a spiritual component to harvesting **m'oots'iksa ho'oks.**

Technological Use

Charles Swanson (Sim'oogit Hayḿaas) recalled a type of balsam called **dakhlee** that was used for planks (Nisga'a Tribal Council Vol IV 1995 pg. 86) and one collaborator confirmed that the wood of balsam was used in building. The Nisga'a occasionally used the wood of *Abies amabilis* for house planks but it was "soft and brittle" (Turner 2001a). One collaborator recalled its use as firewood and another said that the pitch was taken and lit and used like a torch or lantern.

Some northwestern peoples used the boughs as floor coverings and bedding because of their pleasant spicy fragrance (Turner 2001a) but the Nisga'a are not specifically mentioned. Sim'oogit Hleek's (Joseph Gosnell) recollection that "**alda** had a different smell from other trees" implies that the Nisga'a probably did use it for these purposes (2008).

Seeks – Sitka spruce – *Picea sitchensis* (Bong.) Carr, Engelmann spruce – *Picea engelmannii* Parry ex Engelm; hybrid white spruce – *Picea engelmannii* x *glauca* or white spruce – *Picea glauca* (Moench) Voss. Family: Pinaceae (Pine family)

Nisga'a word meaning[13]: related to **seek'al** 'rough (in texture)', like the bark

In the major drainages of northwestern British Columbia, i.e., the Skeena, Nass, Iskut and Stikine Rivers, there is a natural gradient of hybridization between the interior spruces,

[12] "No information reported" refers to oral interviews where research collaborators either did not recall or chose not to disclose the information; "No information recorded" " refers to the literature consulted during the course of this research.

[13] Unless otherwise noted, Nisga'a word meanings are from Tarpent 2011.

Picea glauca (boreal), *Picea engelmannii* (subalpine) and the lowland coastal spruce *Picea sitchensis*. If within sight or influence of the ocean, at low elevations, around Gingolx, **seek̲s** (spruce) probably refers to *Picea sitchensis* (Sitka spruce). At high elevations and upriver near Gitlax̲t’aamiks, **seek̲s** probably refers to *Picea engelmannii* (Engelmann spruce). Pure *Picea glauca* (white spruce) is unusual in the coastal mountains. Without knowing the exact location of collection, when informants refer to **seek̲s**, the species could include *Picea sitchensis, Picea engelmannii* or *Picea engelmannii x glauca x sitchensis* (Grossnickel et al. 1996).

Food Use

Six people recalled that the pitch from **seek̲s** was taken off and chewed like gum as a treat, and one person said that the emergent tips were brewed into a refreshing tea. Four people recalled that the inner bark was taken off in thin strips and two said that it had to be eaten immediately. However, one person thought that the inner bark was pounded and dried like seaweed, and could be stored in the same manner as hemlock inner bark. The Nisga’a literature records the consumption of spruce inner bark for food, where Sim’oogit Laaỳ (Christopher Calder) (pg. 78) and Sigidimnak̲’ Nits’iits’Hootkw (Grace Azak) (pg. 199) recalled that the inner bark was eaten but never stored (Nisga’a Tribal Council Vol. IV 1995).

Medicinal Use

Arthritis/Rheumatism: Two people recalled that the pitch of **seek̲s**, on its own or mixed with other medicines such as powdered **haxwdakw** (western yew – *Taxus brevifolia*), was applied to arthritic areas after the area was first burned with a small piece of hot slow-burning fungus growing on the trunk of **seek̲s** (spruce – *Picea sitchensis*). The fungus has been tentatively identified as brown trunk rot (*Fomitopsis pinicola* (Dw.Fr) P. Karst). The Nisga’a sometimes used the pitch alone or mixed with other medicines after **mihlxk̲ws** to treat and protect the infection.

Another collaborator thought that the new growth from either **seek̲s** or **sginist** (lodgepole pine) was mixed with **wa'ums** (devil’s club) and made into a tea for arthritis.

Spruce pitch was mixed with the pounded tips of **simgan** (western redcedar) and the leaves of **k̲'aax̲aayst** (false lily-of-the valley – *Maianthemum dilatatum*), made into a salve, and applied to wounds. Later, sockeye salmon roe was added to make the salve soft and to prevent it from congealing. This mixture healed the wound and helped to prevent infection and blood poisoning (Nisga'a Tribal Council Vol. I1995 pg. 89).

Burns: One person recalled that pitch was warmed and applied externally to burns to soothe them and protect them from infection.

Chest Conditions: Two people recalled that pitch from **seeks** was mixed with a little warm water and used to treat bronchitis and other chest infections. Both said that the medicine was swallowed slowly to suppress coughing. One person said that the warmed pitch was mixed with eulachon grease and applied externally on the chest to relieve chest congestion.

Digestive Disorders: One person recalled that: "the pitch of **seeks** is powerful medicine. It could be picked off the tree bark and used alone or mixed with drink made from the bark of **wa'ums** for cleaning out your insides" (Sim'oogit Ni'isjoohl – Horace Stevens 2007). Sim'oogit Ni'isjoohl also said that this concoction could be used for other conditions.

Orthopaedic Aid: One person said that **seeks** pitch mixed with eulachon grease was used on the surface of a fracture to help the bones after a break. This mixture was applied after first anaesthetizing the area with **mihlxkws** (a burning piece of poplar or spruce or hemlock fungus). This recollection is similar to that found in Nisga'a Tribal Council Volume I (1995) which describes the application of a salve made from the pitch of **seeks**, powdered tips of **simgan** (western redcedar – *Thuja plicata*) fronds, the pounded leaves of **k'aaxhaayst** and salmon roe to soothe a fractured area.

Skin Disorders: Six people said that the warm pitch from **seeks** was applied as a poultice to draw out the poison from boils or other wounds. The use of this pitch is comparable to the use of **ho'oks** or **alda** for the healing of boils. Sim'oogit Ginwax (Abraham Davis) said that spruce gum was mixed with the pounded tips of **simgan** and applied to boils (Nisga'a Tribal Council Volume IV 1995 pg. 88).

Sleep Disorders: One person recalled that the new spring growth of **seeks** was brewed into a tea to help you sleep.

Tonic: One person said that these spring tips were also prepared as a tea and taken as a general tonic, to purify your system.

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **seeks** for spiritual or ceremonial purposes by the Nisga'a.

Tsimshian shamans or the hunters and fishermen themselves used the boughs of this species to whip themselves in a purification ritual before going out to hunt or fish (Compton 1993, pg. 342). Sitka spruce boughs were also used by the Hanaksiala and Haisla; young boys were first hit with spruce boughs until blood was drawn, then immersed in cold water as a ritual to increase their strength and tolerance (Compton 1993, pg. 190).

Technological Use

Ancient stories say that:

> *At the time of the flood, strong branches of this tree were used like anchors, attached to the canoe, then jammed in between rocks to stop the canoes floating away and that in the old stories this also is the tree that provided the pitch for burning* (Sim'oogit Hleek – Joseph Gosnell 2008).

Sim'oogit Gadim Galdoo'o – Charles Alexander (2008) recalled that some **seeks** have a growth abnormality inside them that was cut out and used like a torch. He called the growth **sginist** (which is Nisga'a for pine). He also recalled that:

> *...if there were **ts'ak'a gan** (burls) growing on spruce, they were hollowed out by building a fire inside the burl, it was left to burn a little and then the coals were taken out, the fire was lit again day after day, until it's thin and then it can be used as a bowl.*

Sim'oogit Gadim Galdoo'o also recalled that saplings of **seeks** were planted when people moved to a new place to act as landmark and measure the time living at that place, based on how much the tree had grown.

Sim'oogit Ni'isjoohl (Horace Stevens) recalled that:

> *...knots from **seeks** were used to girdle a tree before cutting it down...allowing the tree to dry before cutting it ... it took five to six*

> *years for tree to dry and fall. Such girdling also allowed a person to mark the tree so no one else could cut it* (2007).

One person recalled that **deex** (the poles for holding eulachon nets in place) could be made from **seeks.** He also said that in the 1950's, spruce was used to make lumber in Gingolx sawmills. Another collaborator said that her dad used **seeks** to make big hammers for pounding anything. Sim'oogit Ni'isḿuus (Sam Tait) said that **seeks** was used for firewood, making planks, tools and that the bark was carved into plates and used for shingles (Nisga'a Tribal Council Vol. IV 1995 pg. 85).

One collaborator said that the branches of both **seeks** and **giikw** (western hemlock – *Tsuga heterophylla*) were used in Gingolx to gather the spawn of herring, even though the needles of **seeks** were a bit sharp. **Seeks** was and continues today to be used for Christmas trees and for firewood according to two informants.

The **wist** (roots) of **seeks** were used to make hats, as well as the webbing for snowshoes, baskets, boxes, hats, capes, and dance regalia (Boston et al. 1996, McKay et al. 2001) and the sap was used for dye (Boston et al. 1996). Spruce roots were used by Haida, Tlingit and other northwestern coastal peoples to make water-tight hats and baskets (Turner 2001a).

Agnes Haldane recounts a story where spruce pitch was used for caulking boats (Barbeau 1958; McKay et al. 2001). The Tlingit used spruce for dovetailing and making joints water-tight when making canoes and also made "second grade canoes" from Sitka spruce (Krause 1956 pg. 118-119).

Sginist – lodgepole pine (also called jackpine by many) – *Pinus contorta* Dougl. ex Loud. Family: Pinaceae (Pine family)

Nisga'a word meaning: a derivative of sgan (resin, gum)

There are two taxonomic varieties of pine found on Nisga'a traditional territory: *Pinus contorta* Engelm.var. *latifolia* (lodgepole pine) and *Pinus contorta* Dougl. ex Loud var. *contorta* (shore pine) (Hosie 1979; Douglas et al. 1998).

Lodgepole pine is distributed widely throughout the mid- and lower elevations on Nisga'a traditional territory (Klinka et al. 1998; E-Flora BC). Shore pine is restricted to shallow soils, rocky outcrops and poorly drained sites in the CWH (Banner et al. 1993, E-Flora BC) and so would only be found around Gingolx and possibly Laxgaltsap. Although the people of Gingolx did not distinguish between the two varieties of pine in our discussions, they were likely including this variety when referring to **sginist**. People living upriver were probably referring to the interior variety of lodgepole pine.

Food Use

> *...in May, you do the pine, you take the bark off the pine tree in early morning with a knife, looks like big white ribbons; just eat it right there before it melts; this is called **sk'anhix*** (Sigidimnak' Kwhligyoo – Lavinia Azak 2010).

Four people remembered that the sweet inner bark of **sginist** (lodgepole pine, *Pinus contorta*) was prepared in a manner similar to that of **seeks** but said that it must be eaten immediately or it would deteriorate. Two people said that this food was known as **sk'anhix.** This term is also used in the the Nisga'a Tribal Council Volume 1 (1995)**.** The word **sk'anhix** (or possibly **k'anhix**) is an interesting term for the inner bark because it is similar to the Nisga'a name for the pine **sginist**. However, according to Tarpent (pers. comm. 2011) the two words are unrelated.

Three people recalled that the sweet gum was chewed and enjoyed in the spring, but no one reported any detail on how it was prepared or eaten.

First Nations throughout BC used the pine tree for food. In the north, the Gitxsan and Wit'suwit'en ate the new phloem fresh and the Wit'suwit'en dried the strips of inner bark and stored them for future use (Gottesfeld 1992a).

Medicinal Use

Arthritis/Rheumatism: One person recalled that the new growth of **sginist** and/or **seeks** was brewed into a tea that was used to ease the pain of arthritis.

Chest Conditions: Two collaborators recalled **sginist** pitch was chewed or made into a tea to relieve chest infections and/or tuberculosis. Similarly, the Gitxsan and and the Northern Carrier used pine for chest infections, including tuberculosis (Smith 1929)[14].

[14] When referring to the Northern Carrier, Smith means the Wit'suwit'en people near Hagwilget Canyon and the Sekani people living northeast of that.

The Saik'uz[15] people used the bark and pitch to treat chest conditions (Thomas 2004)

Digestive Disorders: No information was reported or recorded for a Nisga'a use of **sginist** for digestive disorders. Smith (1929) recorded that the Gitxsan used the inner bark and/or needles of **sginist** as a purgative to cleanse the digestive system. A decoction of new shoots was taken by the Southern Carrier[16] (Ulkatcho) people as an analgesic for stomach pain Smith (1929).

Eye Disorders: No information was reported or recorded or a Nisga'a use of **sginist** for eye disorders. The Wit'suwit'en painted the pitch from pine on their eyelids to remove white scum (eye infection) and also to help prevent snow blindness (Smith 1929).

Orthopaedic Aid: No information was reported or recorded for a Nisga'a use of **sginist** for orthopaedic aids. The Wit'suwit'en used a concoction of needle tips for paralysis, weakness or sores (Smith 1929).

Skin Disorders: No information was reported or recorded for a Nisga'a use of **sginist** for these ailments. The Wit'suwit'en used a concoction of the needles to treat body sores (Smith 1929) and the Saik'uz people used the bark and young stems of this species for treating wounds and infections (Thomas 2004).

Tonic: One collaborator recalled that the sap was used in the spring to make a tea that was used for a tonic and to treat minor ailments. The Gitxsan also prepared a similar decoction with the inner bark (Gottesfeld (1992a).

Unspecified Illness: Four collaborators recalled that **sginist** was used for medicine but they could not recall which part was used, how it was prepared, or what specific illness or condition it was used to treat.

Sexually Transmitted Disease: No information was reported or recorded for a Nisga'a use of **sginist** for treating sexually transmitted disease. A decoction of the inner bark was used by the Gitxsan to treat gonorrhea and similar ailments (Smith 1929). Similarly, the Tlingit prepared an infusion of sprouts and bark to treat syphilis (Krause 1956).

Spiritual/Cermonial Use

No information was reported or recorded for the use of **sginist** for spiritual or ceremonial

[15] The Saik'uz refers to the Carrier Nation whose traditional territory is near Vanderhoof, BC.
[16] The Ulkatcho (Southern Carrier) refers to the nation whose traditional territory is near Anahim Lake, BC.

purposes by the Nisga'a or any northwestern First Nation.

Technological Use

Three collaborators recalled that the pitch from **sginist** was used for torches or for making candles and three people recalled its use for lumber. Four people said it was used for firewood. This use is also recorded in Nisga'a literature (Sim'oogit Hayḿaas – Charles Swanson; Nisga'a Tribal Council Vol. IV. pg. 86). One person said that the needles of pine were burnt on the tops of stoves to drive out mice and rats. Hlguuhlkwhl Luulak' describes the use of:

> *...a slow burning aged root, placed in a seashell container...used as a fire starter...all those who travelled in the woods carried this, as a fire starter ... it was a must for hunting or travelling* (Nisga'a Tribal Council 1995 Vol. I, pg. 20).

One collaborator suggested that Sigidimnak' Hlguuhlkwhl Luulak' was referring to the roots of **sginist**.

Giikw – western hemlock – *Tsuga heterophylla* (Raf.) Sarg.

Family: Pinaceae (Pine family)

Tsuga heterophylla (western hemlock) is common from low to middle elevations on fairly dry to wet slopes, river terraces, lowland flats and coastal forests in most of BC (E-Flora BC, Hosie 1979, Pojar & MacKinnon 1994)[17]. It occurs throughout Nisga'a traditional territory on suitable sites and is a dominant tree along with redcedar in the forests near Gingolx and Laxgaltsap and to a lesser extent, Gitwinksihlkw.

Food Use

> ***Giikw*** *....that's what we make **ksuuẃ** out of. It takes a whole week to do it. They fall the tree and they take the bark off and the ladies scrape it. Then they have to dig a firepit, and start a fire and put in layers of **hiinak*** [skunk cabbage leaves – *Lysichiton americanus]* *and they put the **ksuuẃ** in. Then they put another fire on top and*

[17] Throughout the species by species descriptions, unless otherwise noted plant distributions are from E-Flora BC (http://www.geog.ubc.ca/biodiversity/eflora/), MacKinnon et al. 1999, Pojar and MacKinnon 1994, and Douglas et al. (2002).

> *more* ***hiinak̲ l****eaves. They draw it [the cambium] out of there, and then they put it on racks. They had to take the poisons out of it, so that's why they put the fire in there, it steams the stuff [poison] out of it and it goes away. All that's left is that pulp; when it's pure pulp, that's what they dried. It would take about a whole week to do the whole thing. And then in the wintertime they would have it with* ***dayks****...that's snow, grease and sugar mixed with berries. You soak it until it's really soft and you can chew on it. They put it in cakes and they stored it away for winter* (Sim'oogit Ksdiyaawak̲ – George Williams 2008).

Fourteen out of 16 collaborators recalled that the inner bark of **giikw** was harvested in the late spring and that "in the old days" it was prepared as a food for winter, although most had not eaten it for decades. The bark taken directly from the tree is called **haadiks** and when it is pounded and dried in the sun and prepared for winter storage it's called **ksuuẃ** (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

In preparation for gathering **haadiks**, the trees were first felled, but according to Sim'oogit Gadim G̲aldoo'o (Charles Alexander),

> "*...we don't pick the great big ones ... just smaller, maybe 24 inches"...there is a tool called a* ***hahaltswk*** *for scraping the bark. It has a sharp edge that scrapes the bark from the tree. The women scrape the bark, squatting on the ground starting at the top and moving down the tree scraping off big pieces…* (2008).

The finished **ksuuẃ** was wrapped in leaves of **hiinak̲,** then stored in **gal'ink̲** (a bentwood box) lined with leaves of **hiinak̲** and buried in the ground for winter use. **Ksuuẃ** was served throughout the winter with various stored berries and/or crabapples (**Milkst** – *Malus fusca*), mixed with eulachon grease. Sigidimnak̲' Hagwilook̲'am saxwhl giis (Irene Seguin) said it was used as a dessert but that it was not what we would call a dessert today. When asked about the taste, she said with a smile "it tastes like a tree."

One collaborator said that the pitch from **giikw** was used to sweeten food. The Gitxsan and Wit'suwit'en also used the cambium as a food sweetener (Gottesfeld 1992a).

Medicinal Use

Digestive Disorders: Two people recalled that pieces of inner bark were swallowed to protect the stomach or intestines if something sharp was swallowed. One person said that it could be used as an emetic, or vomit inducer, "to clean you out." Sigidimnak' Alisgum Xsgaak (Dorothy Doolan) recalled that the inner bark was used as a medicine in the past. She felt that "...this might be why there was not too much trouble with appendicitis in the old days" (Nisga'a Tribal Council Vo. IV 1995 pg. 103).

Unspecified Illness: Three collaborators recalled that **giikw** was also used for medicinal purposes. Sim'oogit Gadim Galdoo'o (Charles Alexander) said that bark from the tree was soaked and mixed in a concoction with **wa'ums** (devil's club – *Oplopanax horridus*) and **haxwdakw** (western yew – *Taxus brevifolia*) and other medicinal plants, then used to treat a variety of illnesses. He said that the mix of plants used depended on the illness and on the person being treated and their response to the medicine and that "they tried different things, to see how they would work."

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **giikw** for spiritual or ceremonial purposes by the Nisga'a or any northwestern First Nation.

Technological Use

> *One day a young man named T'axhay from the Gitwinksihlkw village at (Ts'oohlgiist) took a little stone adze*[18] *and went out to get* ***amgiikw****, young hemlock, to make salmon traps...*
> (Sim'oogit Gwiix maaẃ – William Foster 1927 in Nisga'a Tribal Council 1995 Vol. II, pg. 70).

The above quote implies a long history of the use of **giikw** for technological purposes. When speaking to collaborators in the modern day about **giikw**, other technological uses were recalled. Five collaborators said that the branches of **giikw** were used to collect herring eggs and five also said that eulachon bins were lined with boughs of **giikw** and boughs were put on top of the eulachons to keep birds from taking the fish.

[18] The use of a stone adze in this quote implies a long history for the technological use of **giikw.**

One person, very familiar with eulachon fishing, said that **dee<u>x</u>**, the poles for holding the eulachon nets apart and **haḿin-hakwhla'a**, a hook used for hooking up an eulachon net, were made from **giikw**. Another recalled that small tools like hammers and hooks used in fishing for eulachon and other fish were made from **giikw**, and another said that hemlock poles were used to dry fish in the smokehouse.

Sim'oogit Bayt Ńee<u>k</u>hl (Jacob Mckay) recalled that **giikw** was made into strong wedges used to split cedar into planks (in Mackin 2004). Sim'oogit Gwingyoo (Abraham Williams) and Sigidimna<u>k</u>' Niys<u>k</u>'ankw'ajikskw (Lucy Williams) recalled that the Nisga'a used hemlock twigs to form the rims of birch-bark baskets (McNeary 1974a), Ni'isỳuus (Sam Tait) said that "the people near the salt waters use **hay<u>x</u>kw** (rotted hemlock) for drying fish (Nisga'a Tribal Council 1995 Vol. IV. pg. 86). The pitch from this species (and other conifers) could be used as glue (Turner 2001a). Snowshoe webbing and tumplines were woven from cedar bark and powdered colours (e.g., from *Xanthoria* sp. orange rock lichens) were mixed with crushed cedar bark and dried chewed salmon roe for dye (Boston et al. 1996). Peoples from the Northwest Coast made harpoon parts from spruce and western hemlock roots; the dense knots were used for fishing hooks [for cod and halibut], and the pitch was used to protect implements (Turner 2001a). Barbeau (n.d.) notes that spears for hunting and warfare were made from hemlock.

Alda (?) – Douglas-fir - *Pseudotsuga menziesii* (Mirb.) Franco
Family: Pinaceae (Pine family)

> *Oh yeah, we have those here. It's got thicker bark. We used to use them for wood here. They are the ones that give the most heat. My uncle used it for building a speed boat. There was a saw mill here in town and he took a couple of trees and he gave one tree to the saw mill and they cut them up. So he built a speed boat out of it. He seasoned them (the wood) under his house for a year and left them there, goes fishing in the summer time. So the next year, they're nice and dry and he starts building a speed boat. It's nice and dry and he doesn't have to caulk it, and he doesn't have to fiberglass it. He just*

> *put it in the water…and he said it will tighten up once you put it in the water. So I was quite surprised by that ... There are not too many* (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

The correct identification of **alda** species and whether it was found on Nisga'a traditional territory is complicated by the fact that "fir" is the common name that has been used by many (including some professionals) to describe both the "balsam" firs (*Abies amabilis* **– ho'oks**, and *A. lasiocarpa* – **alda**) as well as Douglas-fir (*Pseudotsuga menziesii*), which is not a true fir. Further confusion arises because in the Nisga'a dictionary (McKay et al. 2001), **alda** is described as Douglas-fir, while in the student vocabulary guide, **alda** is referred to as "alpine fir" (Williams 2006).

Two collaborators, both former loggers, said that Douglas-fir grew in the Nass, "around the outer part", but that there were not too many. One person said that Douglas-fir wasn't called **alda**, but he couldn't recall the Nisga'a name at the time of the recorded interview. One person, brought up in Gitwinksihlkw, thought that the Douglas-fir species was not found so far north. Nancy Turner (pers. comm. 2009) reported and photographed Douglas-fir growing near Gitwinksihlkw in the forest.

There is currently no record of Douglas-fir documented as being collected within the Nisga'a traditional territory in Douglas et al. (1998), nor in the E-Flora database. It is unclear whether this species is naturally found in the Nass Valley, was planted, or if its reported use is associated with logs milled in the area[19]. One collaborator suggested that it is possible that in modern times Douglas-fir was boomed or trucked into the valley, along with other species such as western redcedar and cut into lumber (Sigidimnak' Kwhligyoo – Lavinia Azak 2010).

Food Use/Spiritual Use

No information was reported or recorded for the use of Douglas-fir for food or spiritual purposes by the Nisga'a or any northwestern First Nation.

Medicinal Use One person thought that the Haida used Douglas-fir for medicine, but this

[19] There was a sawmill operating at one time in Gitwinksihlkw and logs from different conifers were brought to the mill for processing (Sigidimnak' Kwhligyoo 2010)

is unlikely because this species does not grow on Haida Gwaii, and it was known to the Haida primarily as driftwood, or perhaps from their travels down south (Turner 2004a).

Technological Use

Two collaborators thought that the wood from Douglas-fir was good fuel for stoves because it burnt for a long time and gave good heat. One person said that the wood was good for building sleds and another said that when milled, it was good for building.

Two people, including Sim'oogit Gadim Galdoo'o, said that **alda** was used for boatbuilding in the Nass. Whether they were referring to Douglas-fir or subalpine fir is not clear. A web search revealed that in the modern day, the use of Douglas-fir for boatbuilding is common[20]. On the other hand a web search on the use of subalpine fir for boats did not elicit its use for building boats at this time. The wood from this species is said to have "... relatively low wood density, high moisture content, frequent occurrence of high moisture pockets and slower drying rate..." and so it may not be suitable for boat construction (Knudson et al. 2008).

There were many uses for this species by southern First Nations along the coast, in the interior of BC and down into the United States because it grew more abundantly in these areas (see Moerman 2002). For example, the Kitasoo found that the wood was an excellent fuel source and the Haisla and Hanaksiala used the pitch for bindings (Compton 1993). The Nlaka'pamux (Thompson) peoples used a rare crystalline sugar exuded from the needles as a sweetener (Turner et al. 1990).

Simgan – western redcedar – *Thuja plicata* Donn ex D. Don

Family: Cupressaceae (Cypress family)

Nisga'a word meaning: sim denotes real, best, ideal, etc., **gan** denotes tree, wood.

In British Columbia, *Thuja plicata* is commonly found along the coast and on wet to moist floodplains and river terraces. On Nisga'a traditional territory, it is most common along the coast and at low to middle elevations where it grows to a good size. The trees diminish in size with increasing elevation and at the highest altitudes are generally

[20] See: *http://www.glen-l.com/wood-plywood/bb-chap5e.html* and *http://www.clcboats.com/shoptips/stitch_glue/boatbuilding_wood.html*

reduced to a shrub (E-Flora BC, Hosie 1979, Pojar and MacKinnon 1994).

> *The first tree that the* Ẃahlingigat [ancestors] *saw within Lisims was the **simg̲an**. They called it **simg̲an** when it started to grow... The other trees did not have any significance to them, so they were just ordinary trees. There was only one tree called **simg̲an**...the redcedar. This was what my father told me.* (Sim'oogit Ẃii Gadim X̲sgaak – Eli Gosnell, Nisga'a Tribal Council 1995 Vol. Ipg. 88).

> *This tree is very interesting. My late father calls this tree "The Tree of Life" because of its many, many uses. Not only the branches and the bark and the sap but the wood itself was used in many, many forms... from making canoes that our people travelled in to totem poles that depicted the art and the culture of our people, so this tree has many, many uses and my father called it "The Tree of Life for the Nisg̲a'a people*" (Sim'oogit Hleek̲ – Joseph Gosnell 2008).

> *…what it means is real tree…genuine tree. That is because it was used for absolutely everything in the olden days* (Sim'oogit Hayḿaas – Chester Moore 2008).

The importance of **simgan** to the Nisga'a is evident in the above quotations. Its importance was understood by all the collaborators. All 14 people with whom this species was discussed knew the name **simgan** and knew that it was a tree that was integral to the Nisga'a way of life in the past, and remains highly regarded today.

Food Use

No information was reported for the Nisga'a use of **simgan** for food. However in Ayuuk̲hl Nisga'a (Nisga'a Tribal Council, Vol. IV, pg. 83), Sigidimnak̲' Lootkw (Beatrice Bright) said that the roots of cedar were cleaned off, peeled and eaten with grease and sugar.

Medicinal Use

Burns: One collaborator said that eulachon grease was put on burns that were then covered with the inner bark of redcedar.

Orthopaedic Aid: The mixture of "the tips of cedar fronds" and **k'aaxaayst (**false lily-of the-valley – *Maianthemum dilatatum***)** mixed with spruce pitch was used to put on the surface of fractures to promote healing (Nisga'a Tribal Council 1995 Vol. I, pg. 90).

Skin Disorders: Cedar frond tips, **k'aaxaayst** and spruce pitch was used on open wounds, to treat boils and blood poisoning and to prevent infection (Nisga'a Tribal Council 1995, Vol I, pg. 88-90).

Tonic: "Cedar frond tips" were pounded into a powder and soaked in water for a period of time. The resulting drink was a revitalizing tonic "taken by people who were sick, to bring them back to health" (Nisga'a Tribal Council 1995, Vol. I., pg. 90).

Unspecified Illness: One collaborator recalled that well cleaned redcedar roots were steamed and mixed with the stalks of **wa'ums** (devil's club – *Oplopanax horridus*) and used for medicine. Another said that the roots and bark were used for medicine, but he was not sure of the details for preparation or use.

Spiritual/Ceremonial Use

> *When my grandfather was going to cut some redcedar he has to talk to the tree, walk around the tree, stops, he walks with the sun… he doesn't walk against the sun. After calling to the sun, he talks to the tree, he starts to chop at the bottom where he is going to rip the cedar bark off. He doesn't touch where the sun rises and where the sun is travelling – there is no exception* (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

Two people said that the **simgan** was greatly honoured and respected but could not recall specific spiritual use. Another person said that totem poles made from **simgan** reflect the art and culture of the Nisga'a and their spiritual respect for the tree. This attitude is reflected in this description: "**Simgan** was used to carve totem poles for spiritual ceremonies and commemorations to celebrate the beginning of the Nisga'a or the origin of the tree itself" (Nisga'a Tribal Council 1995, Vol. I, pg. 92).

One person recalled that redcedar tree branches were put between mattresses for good luck and that as traditions changed, post-contact, the branches were used around the house at Christmas and Easter to bring good luck.

Technological Use

Most collaborators who discussed **simgan** could recall its use for technological purposes. One person said that in the old days, the inner bark of redcedar was used to make **'la'o'a'**[21] (clothing) and Chilkat blankets[22] (Nisga'a Tribal Council 1995, Vol. I, pg. 91). A fire starter called **giḿist** was made from dried **'hat'al'** (redcedar bark strips), stripped from the tree in the spring. The **'hat'al'** was dried and saved in a wool-like form as **giḿist**. To start the fire **giḿist** was

> *...placed on a slab of rock and a special stick standing on end* [fire drill] *between the strands of* **giḿist** *was turned by hand. When the point of the stick become hot from friction, sparks came from the tip of the stick causing the* **giḿist** *to smolder and burn...whenever people were travelling away from home they took* **giḿist** (Nisga'a Tribal Council 1995, Vol. I, pg. 91).

"Indian putty" used for caulking and glue was made by mixing together aged eulachon and the rotten centre of **simgan** (Sigidimna<u>k</u>' Naa Uuk – Florence Burton; Nisga'a Tribal Council 1995, Vol. I).

Today, many people strip redcedar bark annually and use it for arts, crafts and to make clothing for regalia, sports events, graduation ceremonias and other modern-day celebrations (Sigidimna<u>k</u>' X'aḿaal – Mercy Moore 2007; Sigidimna<u>k</u>' Hagwiloo<u>k</u>'am saxwhl giis – Irene Seguin 2008) (Figure 2.2).

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[21] The spelling of this word is unconfirmed and was not recognized by any of the collaborators.

[22] According to Emmons (1991), the technique for weaving Chilcat blankets originated with the Tsimshian, but the technique was "carried to the Chilkat through marriage." An old Tlingit woman took apart a blanket made by the Tsimshian, studied the workmanship of it, then created a Tlingit Chilkat blanket known as "narkheen" which is said to be borrowed from the Tsimshian (Emmons 1991 pg. 224).

Figure 2.2. Redcedar bark headbands made by Sigidimnak’Alisgum Xsgaak – Diane Smith (photographed in 2008).

Five people recalled that canoes were made from **simgan**. The largest redcedar were found on Haida Gwaii and the Nisga’a traded furs, eulachon grease and other items for these large trees (Collison 1915, Turner 2004a). One collaborator recalled that:

> ***Simgan*** *was the tree of my grandfather’s canoe; it was a war canoe, it’s the one they call* ***simḿaal****...it can take five people in it and it can go anywhere. It’s a midsize canoe and there’s a* **ḿaalim ansukws**, a *short one that holds only two people and they sneak up to game with it when they’re hunting...* (Sim’oogit Gadim Galdoo’o – Charles Alexander 2008).

Four people recalled that several kinds of baskets were made from redcedar bark. The bark was taken from the tree in May or June each year. One collaborator explained that a **dihlkw** (large basket) and a **ýuusa’alt** (small basket) were both made from inner cedar bark as well as a type of waterproof basket called **gokw**. **Gokw** were waterproofed by immersing them in water so the roots would swell; they were used for bowls before there were wooden bowls (McKay et al. 1986).

Four people also said that mats for ceremonial purposes were made from the inner bark of redcedar. For example, the mats for young women to stand on during cleansing after their **wilba ýaskw** (first period), mats for wedding ceremonies, and mats for drying berries were all made of **simg̲an.** One person said that redcedar wood was used to make drying racks for berries. Similarly, four people said that redcedar bark was used to string eulachon and dry them in the sun, and two people said that sticks for drying eulachon were made from cedar branches. A hand-woven rope called **k̲'ok̲hl** was made from redcedar roots.

The roots were also used for making **bana'a** (dip nets), as well as for making **heen**, strainers used to take the grease from the cooked eulachons (Nisg̲a'a Tribal Council 1995 Vol. I, pg. 90).

The outer bark of redcedar was used as a general covering for protection from the elements, particularly for roofing and for covering canoes. The wood was used for lumber, split with wedges made from hemlock knots (McKay in Mackin 2004). Swanton (1904 in Turner 2004a) said that cedar bark roofing was formerly traded to the Nisg̲a'a at a price of one blanket per two sheets of bark. Two people said that **wo'omhlkw** (cradles) and **gal'ink̲** (bentwood boxes) were made from redcedar and four people recalled that redcedar was used for lumber and building houses.

Three people discussed the carving of totem poles with **simg̲an** and the same three also recalled that it was used for carving smaller items, such as bowls and other small implements. One person said that the boughs were also used for emergency sleeping mattresses. Its use was also documented in the Nisg̲a'a literature.

> *The long thin branches of small young cedar trees were cut in spring while soft, split in half or quarters, then twisted together to make a strong, light rope called **k̲'ok̲hl** used for fish traps or house construction .... Cedar roots were used to make ropes and that the bark was made into lines for stringing eulachons. ... Cedar bark was used for the walls of hunting cabins, the logs were used for memorial poles and that the shafts of spears and sometimes bows were made from the young branches* (Sim'oogit Ẃii Gadim X̲sgaak – Eli Gosnell in McNeary 1974a, 1976).

Sgwinee'e – yellow-cedar, Alaska cedar **–** *Chamaecyparis nootkatensis* (D. Don) Spach
Family: Cupressaceae (Cypress family)

Yellow-cedar is said to be the longest-lived tree on the coast of BC, with individual trees commonly reaching 1,000-1,500 years of age (Pojar and MacKinnon 1994). In BC it is found on wet to mesic (i.e., those with moderate moisture) slopes and bogs in coastal lowland, montane and subalpine zones. It is often found on the Northwest Coast of BC in old-growth stands and in association with redcedar and western hemlock.

Collaborators living in the upriver villages of Gitlax̱t'aamiks and Gitwinksihlkw said that they thought that they were too far north to find yellow-cedar, but that it was found on Nisga'a territory downriver at Gingolx. One person recalled that his father got yellow-cedar from around Portland Canal as late as the 1950s and 1960s.

Food Use/Medicinal Use/Spiritual/Ceremonial Use

No information was reported or recorded for the use of **sgwinee'e** for food, medicinal or spiritual purposes by the Nisga'a or any northwestern First Nation. The Kwakwaka'wakw of the South Coast used yellow-cedar in sweat baths to treat rheumatism (Boas 1921).

Technological Use

Five collaborators said **sgwinee'e** was used for carving small objects, small table ornaments, and masks. One person said that pieces about eight to ten feet long were used to carve paddles for canoes. Contrary to the opinion that it is only found near the coast, one person said that yellow-cedar grew around Gitwinksihlkw[23] and that burls (**ts'ak'a-gan**) on yellow-cedar were used to make bowls..

One man from Gingolx recalled, and Nisga'a literature records, that the main part of a boat could be made with **sgwinee'e**:

> *...it* **[sgwinee'e]** *is sawn and used for the ribs of the boat...it does not rot for a long time. The front is also made of yellow cedar* (Sim'oogit Ni'isyuus – Sam Tait, Nisga'a Tribal Council 1995 Vol. IV, pg. 85).

One person said that the inner bark of yellow-cedar was used for clothing and for making baskets and mats, and that the green branches were used for improvised mats

[23] This person reported that it could be found at km. 5.5 on the Gitwinksihlkw logging road located near the car bridge.

when picking berries. Nisga'a literature also noted that baskets, mats, boxes, hats, capes and dance regalia and snow shovels were made from the inner bark of yellow cedar. (Nisga'a Tribal Council 1995, Vol IV; Boston et al.. 1996). Three people said that they preferred to use **sgwinee'e** for crafts, such as ornamental roses and headbands, because it smelled nicer and that it lasts longer than **simgan**. Two people said that they used the branches and needles around the house as an air freshener.

Deciduous tree species

> *It wasn't just the conifers that we used in the Nisga'a economy. The various deciduous tree species were used to make appropriate tools and to prepare smoked meats and fish* (Nisga'a Tribal Council 1995 Vol. IV, pg. 86).

Haawak' – paper birch – *Betula papyrifera* Marsh. Family: Betulaceae (Birch family)

Betula papyrifera (paper birch) can grow on a wide variety of soils but does best on well-drained open moist sites in the lowlands and lower mountain slopes (E-Flora BC, Hosie 1979, Pojar and MacKinnon 1994). On Nisga'a traditional territory it is most abundant in the interior region.

Food Use

No information was reported or recorded for any Nisga'a use of **haawak'** for food. However, the Dena'ina people of south-central Alaska ate fresh raw birch sap mixed with fish grease (Osgood 1937; Kari 1995). Sap was traditionally collected by peeling a portion of the tree and scraping the sap into a birch bark basket. The Inland Dena'ina and the Upper Tanana used birch cambium as an emergency food and the Iliamna people made an alcoholic drink from the cambium (Kari 1985, 1995). There are a few records of food use (usually the sap) by peoples living in areas east of BC in Canada and the United States (see Moerman 2002).

Medicinal Use/ Spiritual/Ceremonial Use

No information was reported or recorded for the Nisga'a medicinal use of **haawak'**. In Alaska, the Tanaina people tied outer bark to set broken bones, heating the bark after application until it shrunk to a suitable size (Osgoode 1937; Kari 1995).

No information was reported or recorded for the use of **haawak̲’** for spiritual or ceremonial purposes by the Nisga’a or any other northwestern First Nation

Technological Use

Two people recalled that the bark of **haawak̲’** was used to make baskets. One person said that if the bark was peeled “in a certain way” it could be used to make canoes, but he couldn’t recall the details. Three people said that the wood was good for carving wooden spoons, small utensils, small boxes and bowls. One person said big pieces of **haawak̲’** driftwood were hollowed out about four inches deep, like a square bowl, and that seaweed was dried and pounded in the bowl. Five people said that it was good firewood, but two said that it burned so hot that you had to be careful it did not warp your chimney. One person said that that the bark from **haawak̲’** could be heated, rolled up, lit and used as a torch. Sometimes the rolled bark was put in a tin can and used like a flashlight. One person said that “...the pitch from birch was mixed with blue clay and bear fat to seal wood joints...” (Sim’oogit Gadim G̲aldoo’o – Charles Alexander 2008).

Sim’oogit Ẃii Gadim X̲sgaak (Eli Gosnell) recalled that birch roots were used for making ropes. Sim’oogit Gwingyoo (Abraham Williams) and Sigidimnak̲’ Niysgankw’ajikskw (Lucy Williams) said that birch baskets were made in the Athapascan style. This type of basket had a rim made of a hemlock twig that was attached with spruce roots. Sim’oogit Gwingyoo also recalled that spoons were carved from birch. Headdresses and masks were also carved from birch (McNeary 1974a, 1976).

Sigidimnak̲’ Lootkw (Beatrice Bright) described the “birch being made into a boiler.” This entry follows a description of making a redcedar canoe by hollowing it out, filling it with water, then immersing hot rocks in the water to bring it to a boil. Perhaps **haawak̲’** was used in the same manner when carving a birch canoe. However, other nations used hot rocks immersed in large box for cooking or boiling water (Turner and Kuhnlein 1982). The Nisga’a typically made large boxes or storage containers (**gal’ink̲**) from redcedar. Since the use of cedar for cooking can adversely affect the flavour of the food (Norton 1981, pg. 439, Hagwilook̲’am saxwhl giis 2009, 2011 pers. comm.), perhaps the Nisga’a made boilers for cooking or boiling water from **haawak̲’**.

Birch was “used more commonly by interior peoples – the bark was peeled off the tree in large flexible waterproof sheets." It was considered "... as important to the interior natives as redcedar was to the coastal peoples" (Pojar and MacKinnon 1994, pg. 47; Turner 2001a).

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Luux – red alder – *Alnus rubra* Bong. Family: Betulaceae (Birch family)

Alnus rubra (red alder) is most commonly found in coastal forests in open areas, moist woods, and along streams. It establishes and grows quickly after disturbances such as landslides or logging, but is eventually succeeded by coniferous tree species (E- Flora BC; Hosie 1979; Pojar and MacKinnon 1994). Because it is not usually commercially harvested by the forest products industry, red alder today is often considered a "weed" or nuisance species but it is in fact an important species, ecologically (Hibbs 1996) and culturally (Turner 2001a).

Food Use

No information was reported or recorded for the Nisga'a use of **luux** for food. In the spring when the sap started to run, northwestern coastal peoples scraped the cambium and inner bark off for food, however, there is no specific mention of Nisga'a use (Pojar and MacKinnon 1994, pg. 44; Turner 1995b).

Medicinal Use

Tonic: one person recalled that **luux** was mixed with **ts'ex̲** (juniper – *Juniperus communis*) and used to make an energy drink or tonic. The neighbouring Gitxsan apparently took an infusion of the bark as an emetic and purgative for headaches, coughs and other illness (Smith 1929; Gottesfeld 1992a). The Wit'suwit'en drank an infusion of the inner bark for biliousness (burping) and the Southern Carrier applied the sap to cuts and drank a decoction as a purgative (Smith 1929). The Haisla used the bark to make a dressing for wounds (Gottesfeld 1992a).

Miscellaneous Use: Two people recalled that the bark from **luux** was mixed with other medicines such as pitch from **ho'oks** and **giikw** and an infusion of **wa'ums.** It was said to modify the strong tastes of these other medicines.

Spiritual/Ceremonial Use

Two people recalled that masks and rattles used for ceremonial purposes were carved from **luux** wood and Nisga'a literature records the use of **luux** for carving headdresses and masks (McNeary 1974a).

Technological Use

Eight people said that **luux** wood was used to smoke eulachons and two said that sometimes it was used to smoke salmon. One person said it is used to smoke eulachons, because it burns hot even when the weather is cold. Another person said that naturally dried alder was used to make dark-smoked fish. **Ksiluux** (green alder wood, i.e., undried wood of red alder) was preferred for smoking eulachons, presumably because it provided a lot of hot smoke (McKay et al. 2001, pg. 94). Three people said it was used for firewood, one said he preferred it because it would burn all night, if properly dried.

Seven people recalled that **luux** wood was used for carving spoons, bowls and other utensils, because it is lightweight yet easy to carve and fairly strong. One person said that the wood with the bark on was used to dye cedar bark and another said that the bark was peeled off the tree in May or June to make dye for headbands, baskets or mats.

Milkst – Pacific crabapple – *Malus fusca* (Raf.) C.K. Schneid.

Family: Rosaceae (Rose family)

Sk'anmilkst – crabapple tree

Pacific crabapple grows on the floodplains and banks of coastal rivers, lakes, ponds and marshes. One collaborator recalled there are islands known as Paradise Islands, across from Fishery Bay on the Nass Estuary where there are lots of **sk'an milkst** (crabapple trees) (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008). Another person said that in the past people always used them and that they are still found around the village of Gitwinksihlkw and used by some (Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2008).

Food Use

> *My grandmother partially cooked crabapples, then let the outsides dry while whipping up dark grease with a little water. The*

> *crabapples were then added to the whipped grease. This is called* ***hlayx̲*** *and is served as a dessert with sugar* (Sigidimnak̲' Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008).

Eight people recalled that **milkst** mixed with **t'ilx** (eulachon grease) was served as a dessert and stored for winter. The confection, prepared in this way, stored well. Two people said that in the old days, crabapples mixed with grease were wrapped in the leaves of **hiinak̲** (skunk cabbage), placed in a **gal'ink̲** (bentwood box), then stored in the ground or root cellar. Today, people usually just put the crabapples in jars and mix them with grease when they eat them.

Sigidimnak̲' Nits'iits' Hootkw (Grace Azak) also recalled this preparation and use in Ayuuk̲hl Nisg̲a'a and said that, prepared in this manner, the crabapples could be stored and used throughout the winter (Nisg̲a'a Tribal Council 1995, Vol. IV, pg. 188).

Medicinal Use

No information was reported or recorded for a Nisg̲a'a medicinal use of **milkst**. Crabapple was used by their Gitxsan neighbours (who called it by the same name) for medicinal purposes. They prepared a decoction of the inner bark and branches for rheumatisim, as a general tonic to fatten up sickly or weak people, as a laxative and diuretic, and as a treatment for tuberculosis. They also used the juice scraped from the peeled trunk as a medicine for the eyes (Smith 1929). Other Northwest coastal peoples used the bark alone or with other plant parts for a variety of medicinal treatments for the eyes and abdominal disorders (Pojar and MacKinnon 1994, Turner 2001a).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **milkst** for spiritual or ceremonial purposes by the Nisg̲a'a or any other northwestern First Nation.

Technological Use

One collaborator recalled the roots of **milkst** were dried and used to sew boxes and baskets made from birch bark. Another said that the wood was used for making walking sticks. He also recalled that the wood was hard enough to make hammers for driving **deex̲** (poles for holding eulachon nets) into the river bottom. One person said that saplings were planted when moving to a new place for their fruit and to measure time spent at a particular spot (i.e., growth in size were used as indicators for the length of time living in that area. Sim'oogit Gadeél' ibim Hayatskw (Rufus Watts) recalled that the wood was also used for making splitting wedges and planks (pg. 86) and that fishing hooks were made from **sk'an milkst** crabapple (Nisga'a Tribal Council 1995, Vol. IV, pg. 153). Bert McKay recalled that the wood from **sk'an milkst** was used to make fishing hooks and pegs for fastening longhouse planks (Mackin 2004, pg. 65). The branches were seasoned with oil before being made into pegs (Turner 1998, pg. 182).

Wild Cherries, *Prunus* spp. L. (names not recalled in Nisga'a)
Family: Rosaceae (Rose family)
bitter cherry – *Prunus emarginata* (Douglas ex Hook.) D. Dietr; **snaw (**Western Gitxsan)
pin cherry – *Prunus pensylvanica* L.; and **eluuts'ook'** (W. Gitxsan), **ts'ook' (**E. Gitxsan)
choke cherry – *Prunus virginiana* L.
Word meaning: ts'ook (E. Gitxsan) – makes your mouth smooth so nothing can slip on it (People of 'Ksan 1980).
All three *Prunus* species can be found in northern BC. Bitter cherry is largely a coastal species found in moist forests, occurring south of 55^{o} and west of the Rocky Mountains. Pin cherry occurs on dry to moist sites, mostly at low elevations and is more common in the northwestern interior. Choke cherry grows on the edges of forests and occurs more often on dry, exposed sites, in the southern half of the province predominantly, although it does grow in scattered populations further north.

These three species are being described together because there is little knowledge recorded for their use by northwestern First Nations. Gitxsan names are provided but there is some confusion with respect to the identification of pin cherry and choke cherry. A Gitxsan dictionary (Aboriginal Education Branch n.d.) says bitter cherry was known as "**snaw"** but goes on to identify bitter cherry as *Prunus pensylvanica*. While the common names "bitter cherry" and "choke cherry" might be easily confused by non-botanists, Leslie Johnson confirms that "**snaw**" refers to pin cherry, and that choke cherry and pin cherry both occur around Hagwilget Canyon and at Kitwanga. She is not aware of any bitter cherry in the areas she has visited (pers. comm. 2011). Other sources note that bitter cherry is found on traditional Gitxsan lands too (E-Flora BC, MacKinnon et al. 1999).

Despite the fact that no one recalled a Nisga'a name for any of the wild cherry species, three people had heard of the common names bitter cherry, choke cherry and pin cherry. One person recalled that "pin cherries were the red ones."

Food Use

Two collaborators recalled that "wild cherries" in general were eaten by people in the Nass. One said that they could be found on Nisga'a traditional territory and the other wasn't sure if they could be found locally but knew that cherries were eaten where they could be found. Mathew Johnson confirmed such consumption when he described the harvesting of choke cherries from the Nass for chief's food (Corsiglia 1988).

Choke cherries and pin cherries were apparently widely eaten by the Gitxsan and Wit'suwit'en peoples, despite their tart flavour (MacKinnon et al. 1999). Where wild cherry species are more abundant in southern British Columbia and throughout North America, they were universally consumed for food, and often dried into cakes (Turner et al. 1995, 1998; Moerman 2002). On the plains, the choke cherries were sometimes used as a constituent of pemmican (Hellson 1974; Moerman 2002).

The bark, leaves and seeds of *Prunus* species are said to be poisonous to humans and livestock because they contain cyanide-producing compounds (Taylor and Taylor 1981; Turner and Szczawinski 1991; MacKinnon et al. 1999). Given the poisonous nature of the seeds, care should be taken when eating the fruit with the seed intact.

Medicinal Use

There was no information reported or recorded for Nisga'a medicinal use of any of the wild cherry species. The Gitxsan used pin cherry bark for unspecified medicinal purposes (Gottesfeld 1992a). Several medicinal uses are recorded for both choke cherry and pin cherry by nations to the south (Smith 1929; Turner and Bell 1971; Turner et al. 1980, 1990) and throughout North America (see Moerman 2002).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of wild cherries for spiritual or ceremonial purposes by the Nisga'a or any northwestern First Nation.

Technological Use

Nisga'a literature records the use of the inner bark of "cherry" (*Prunus emarginata* or *P. pensylvanica*) for baskets, mats, boxes, clothing and dance regalia (Boston et al. 1996). There were no records of its technological use by any other northwestern First Nation. Some peoples south of 52^{o} used bitter cherry bark for basketry and clothing (Moerman 2002). The hard wood was used for fuel (Turner 2001a).

Ambokkw – trembling aspen **-** *Populus tremuloides* Michx.

Family: Salicaceae (Willow family)

Nisga'a word meaning: The root of the word is **bok**, and **bokkw** may mean wind blowing on something light, or blowing off something. The name may have to do with the fact that leaves of trembling aspen are constantly in motion or that the seeds are dispersed by wind.

Populus tremuloides is generally an interior deciduous species found at low to mid-elevations, rarely in the subalpine. Such distribution largely limits its presence to the Interior Cedar-Hemlock (ICH) zone in the Nisga'a traditional territory, namely the mid- and up-river portions, in the valley bottoms and lower hillsides. Most people knew about this species. One person, who would prefer to remain anonymous, said with a smile on his face, "oh we know that one, because it's like a woman's tongue – always moving."

Food Use/Spiritual/Ceremonial use

No information was reported or recorded for the use of **ambokkw** (trembling aspen) for food or spiritual purposes by the Nisga'a or any other northwestern Nation.

Medicinal Use

No information was reported or recorded for the Nisga'a use of **ambokkw** for medicinal purposes.[24]

There are records of other northwestern nations using trembling aspen for medicine. The neighbouring Gitxsan used the bark as a purgative (Gottesfield 1992) and the Southern

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[24] Nisga'a literature records the use of a fungal species, which grows on **ambokkw** *(Populus tremuloides)* for **mihlxkws** (moxibustion) treatment of some ailments (McKay et al. 1986, McKay et al. 2001). The fungus, tentatively identified as aspen trunk rot (*Phellinus tremulae*) (Allen et al. 1996), is discussed below. Gottesfeld (1992b) notes the Gitxsan used *Inonotus obliquus* (found on poplar) for moxibustion.

Carrier used a decoction of the bark for abdominal disorders (Smith 1929). The Carrier generally were noted to chew the bark and roots, then apply the mixture to wounds to stop bleeding (MacKinnon et al. 1999). The Saik'uz people used the bark shavings for skin disorders and chest infections (Thomas 2004). The Upper Deanina used the inner bark and the outer bark, mixed with **tiim la<u>x</u>la<u>x</u>'u** (Labrador tea – *Rhododendron palustre*) for coughs and colds (Kari 1985).

Technological Use

One collaborator recalled that this tree is related to **amm̓aal** (cottonwood) and was used as a fuel for smoking fish (salmon). He also said that the bark was taken off the tree and could be used like an ice pack to keep you cool. Another person said that, like **luux** (alder), it was used to carve bowls, spoons and other small utensils. Two people said that the wood was used for firewood.

The Dena'ina people of interior Alaska used aspen for fuel and also mixed the wood ashes with tobacco and used it for chewing tobacco (Kari 1985). The Carrier peoples lined cradles with the rotten wood because it was soft and absorbent (MacKinnon et al. 1999).

Amm̓aal – black cottonwood – *Populus balsamifera* ssp. *trichocarpa* (Torr. & A. Gray ex Hook.) Brayshaw L. Family: Salicaceae (Willow family)

Nisga'a word meaning: Literally means "good for canoe"

Populus balsamifera ssp. *trichocarpa* is found throughout Nisga'a traditional territory on moist to wet uplands and floodplains at low middle elevations.

Food Use

No information was reported or recorded for the use of **amm̓aal** for food by the Nisga'a or any other northwestern First Nation In the southern part of the province, some First Nations scraped the inner edible parts of the bark for food (Turner and Bell 1973; Compton 1993; Turner 1995b, 1997).

Medicinal Use

Digestive Disorders: One collaborator recalled that a light tea was made from dried **amm̓aal** leaves to clean out the stomach, or to cleanse the body in a way similar to devil's club. She said that it was bitter to the taste and so was mixed with another unknown plant to sweeten it.

General Uses: One person said that the bud sap was used as an insect repellent. There is no record of medicinal use by the Nisga'a or any northwestern First Nation. However, many nations in other areas used cottonwood buds to make salves for treating sore muscles. The bark and leaves are made into a tea and taken to relieve pains (Smith 1929; Moerman 2002, 2009).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **amm̓aal** for spiritual or ceremonial purposes by the Nisga'a or any other northwestern First Nation.

Technological Use

Eleven collaborators recalled that **amm̓aal** was used to make canoes. Some collaborators said that the canoes from cottonwood were made for temporary or short-term use only, while others said that if you took care of the canoes, they could last a long time. Others said that cottonwood was usually used to make small canoes (**m̓aal am ts'ooks**) only. One collaborator described why cottonwood canoes were good for warfare:

> *Someone told me that when the neighbours were having wars with the Haida and other people, they ram each other. And these cotton trees, if they use them, it doesn't break … it's kind of like rubber, eh … but the cedar canoes crack. Not a lot of people know about that. I don't know if that's true, but that's what someone told me*
> (Sim'oogit Gwiis Ha – Roger Watts 2008).

Sim'oogit Gwiis Ha is an expert carver and carved his own canoe from cottonwood (Figure 2.3) which he entered into a canoe race in 1995. The canoe, which carried about twelve people, won the race.

Figure 2.3. Sim’oogit Gwiis Ha and the **amm̓aal** canoe he carved.

Sim’oogit Gwiis Ha explained,

> *I like to use cotton tree* [for a canoe] *because it’s easy to carve. And that redcedar, I’ve seen it before and it cracks all over the place. See those ones, down there*, [Sim’oogit Gwiis Ha is pointing towards the beach] *they’re cracked up already. In the old days, I think that they used eulachon grease and they soaked it in eulachon grease and they don’t crack; after they finish, they soak it with eulachon grease. Then it doesn’t crack* (2008).

Sim’oogit Gadim G̲aldoo’o (Charles Alexander) described the making of a canoe called **luu-ksi-yats'a'a**, when you’re in a hurry or practising to make a canoe:

> *They just burn the inside of the canoe. That’s when the branches are used; they put the branches on the outside, like you’re wrapping the tree with the branches, so it wouldn’t burn on the outside, you want just the inside to burn. So when it burns for a few days, you just clean the coals out and that’s it done, you don’t do any more,* [you] *just sharpen the edges and the back* (2008).

Sim’oogit Gadim Galdoo’o also said that you could use **amm̓aal** for making this kind of canoe, as long as you took care of it:

> *My grandfather, he puts a whole barrel of oil in there and he just tips it and lets it soak for days and days and it’s really waterproof. You see the water slides out, inside and outside. And when it’s really hot, he tips the canoe upside down and then he put grease, like eulachon grease, with an old rag, I don’t know how many times a day, and it lasts for life* (2008).

He added that **m̓aalim ansukws** (small canoe) and **sim m̓aal** (mid-sized canoe) could also be made from **amm̓aal**.

Ten collaborators recalled that **amm̓aal** was used for smoking salmon, because it doesn’t burn so hot that the fish would become hard or overcooked. One person said that the thick bark on the old trees was used like coal for fires and one person recalled that big log rounds were set in the mud and used like stepping stones. Three people said that in the spring the buds were used as air fresheners. One person recalled that the roots were used for weaving. One person said that using rotten or aged wood for smoking fish was preferred. In the Nisga’a literature, the use of decayed wood is also mentioned (McKay et al. 1986). Sim’oogit W̓ii Gadim Xsgaak (Eli Gosnell) recalled that the walls of temporary cabins were made from cottonwood bark (McNeary 1974a). The roots were twisted into rope and it was sometimes used to carve masks (Turner 2001).

Haxwdakw – Pacific yew – *Taxus brevifolia* Nutt. Family: Taxaceae (Yew family)

Nisga’a word meaning: This word means 'bow' (as in 'bow and arrow'). It is made up of the prefix **ha-** 'instrument for' and the verb **xwdakw** 'to shoot' (with a bow or a gun).

A search of E-Flora BC for confirmation of the range of Pacific yew (*Taxus brevifolia* – **haxwdakw**) did not yet reveal any collections on Nisga’a territory, although there was a collection from Dundas Island, just off Observatory Inlet.[25] However, because a specimen has not yet been collected does not exclude its presence on Nisga’a traditional territory.

[25] see http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Taxus%20brevifolia.

Perhaps a concerted effort to find it would be a useful endeavour.

Three collaborators said that **haxwdakw** can be found on their traditional territory, but that there was not too much. In literature specific to the Nisga'a, Sim'oogit Ẃii Gadim X̲sgaak (Eli Gosnell) said that this species was found only on the coast (McNeary 1974a). Five other people knew of its medicinal and technological use, but weren't sure whether it grew on Nisga'a territory or whether it was just an item of trade.

One person said that his grandfather would perform a spiritual cleansing with **wa'ums** (devil's club, *Oplopanax horridus*) before going out to collect **haxwdakw** so that he would have a pure heart and have luck in finding it (Sim'oogit Gadim G̲aldoo'o 2007, 2008). Some collaborators said there was "a lot growing on the Haida territory or down further south and it was an important item of trade."

Food Use

No information was reported or recorded for the Nisga'a use of **haxwdakw** for food. On the Northwest Coast, the use of **haxwdakw** by the Massett Haida was recalled by Florence Davidson to Nancy Turner. She said that people "used to eat the berries of yew, but that if a woman ate too many, she would become sterile..." (Turner 2004a, pg. 99). When eating the berries, seeds should not be swallowed; the seeds (and all other parts of the tree) are toxic (Turner and Szczawinski 1991).

Medicinal Use

Burns: One person recalled that **haxwdakw** was mixed with **luux** (red alder – *Alnus rubra*) for treating burns.

Cancer: Four collaborators said that the medicine is used for treating cancer. They could not say with certainty if it was used in the past for this illness or if it was just a modern-day use. Two people said they make the cancer medicine now; both said that they preferred to mix it with with **ts'ak'a aam** (licorice fern – *Polypodium glycyrrhiza*) or **wa'ums**.

Chest Conditions: One person recalled that **haxwdakw** was mixed with **m'oots'iksa ho'oks** (resin beads) from **ho'oks** and/or **alda** (Pacific silver fir – *Abies amabilis*) and/or subalpine fir – *Abies lasiocarpa*) for treating tuberculosis.

Skin Disorders: One person said that **haxwdakw** was used to treat various skin sores.

Unspecified Illness: Four people said that yew wood was used for many different ailments. Of these four people, one said it could be mixed with **wa'ums** and another said it was the main ingredient but it was mixed "with other plants." Jeff Benson described its preparation as follows:

> *... yew wood stems were boiled for 12 hours and the air inhaled. It was also mixed in a concoction with devil's club for various ailments. You make a drink concoction mixed with devil's club for various ailments your body ... the stems are about 1½ inches in diameter* (2008).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **haxwdakw** for spiritual or ceremonial use by the Nisga'a or any other northwestern First Nation.

Technological Use

Five collaborators recalled that **haxwdakw** was used to make bows and arrows because it was hard, yet flexible. Sim'oogit Ẃii Gadim X̲sgaak (Eli Gosnell) said that bows made from **haxwdakw** were often backed with sinew to make them stronger (McNeary 1974a).

Sim'oogit Gadim G̲aldoo'o said that a piece of **haxwdakw** was used like a hot awl to burn holes in the side of a big cedar paddle called a **k'idaa**. Then lined pointed hooks made from bear bones were set into the holes on the side of the paddle as hooks and

> *... then you go like this* [moves like he is paddling] ...*then you can feel it and when it's heavy and you tap it on the sides ... and on every little hook, a little eulachon is on there. It's called* ***ank'idaa*** *or* ***k'idaa****. That's why my grandfather named this island* ***Ank'idaa*** *or* ***K'idaa****...(2007).

Today a **k'idaa** is also the name for an eulachon rake. It is unclear, whether the eulachon rake replaced the **k'idaa** paddle, perhaps when motors were introduced to boats or if **k'idaa** referred to both a cedar paddle lined with bear bones as well as an eulachon rake.

Canoe paddles were also made from **haxwdakw.**

> *In the olden days, that's when they used the yew wood, different types and different models for canoe paddles. The Nisga'a used that wood. Okay, the way they do it…once it's done, it's very sharp on the end, it's almost like a knife. When it's finished, it's nice and dry, they build a fire and they put the sharp ends in and they turn it over and over until it's just about brown and it's almost like iron…it can cut you…it's very strong and sharp* (Sim'oogit Gadim Galdoo'o 2008).

One person thought that snowshoes were made from yew wood, although he said the Nisga'a name for it was **k'ookst** (a name which is more generally agreed to refer to mountain maple – *Acer glabrum*). One person collects **haxwdakw** high in the mountains around Gitwinksihlkw and uses the flexible branches to make wreaths.

2.3.4.2. ***Sk'an*** *– Shrubs*

Shrubs are species with multiple woody stems usually less than 10 m tall. Although there are trees of the genus *Salix* (willow) and *Acer* (maple) species, it was the shrubby species of these genera that are most commonly found on Nisga'a traditional territory, recognized for their uses.

K'ookst – Douglas maple **–** *Acer glabrum* Torr. Family: Aceraceae (Maple family)

Acer glabrum is found on Nisga'a traditional territory from the lowlands to the subalpine. It is most prevalent in the interior of their territory but can also be found on the coast.

Food Use

One collaborator recalled that small pieces of the stems of **k'ookst** were chewed for sweetness. Recent analysis of Douglas maple sap indicates that springtime sugar levels can reach 3%, which is comparable to the eastern sugar maple (*Acer saccharum*) trees traditionally tapped for maple syrup (Patrick Williston, pers. comm. 2011). There are no records of other past food use of this species by the Nisga'a or any other northwestern First Nation.

Medicinal Use

No information was reported or recorded for the medicinal use of **k’ookst** for medicinal purposes by the Nisga’a or any other northwestern First Nation. There are some records of its use for a variety of abdominal disorders, gynecological purposes and snake bite by nations living south of 52^{o} (Turner et al. 1990; Moerman 2002).

Spiritual/Ceremonial Use

One collaborator said that rattles for ceremonies were made from maple, (presumably **k’ookst**, as no other *Acer* species in found north of 52^{o} latitude). Masks, headdresses and “specialty raven rattles,” were carved from **k’ookst**, (McNeary 1974a). There are no records of spiritual or ceremonial use by other northwestern First Nations.

Technological Use

Nine collaborators recalled the use of **k’ookst** for carving; six of them mentioned the carving of spoons, and five mentioned bowls. One person showed me spoons and ladles carved by her father. Carver, Sim’oogit Gwiss Ha (Roger Watts), who lives in Gingolx, said you couldn’t find **k’ookst** around there, but could get it at Erindale. Two people said that bows were made from **k’ookst** and one recalled that her grandfather made a bow and arrows for her son. One person said that his grandfather made masts for boats out of **k’ookst**, as well as anything that needed to be really strong. This collaborator is the same person who said that **k’ookst** was the Nisga’a name for yew wood, so it is possible that he was confusing the two species. Two people said maple wood was used for making snowshoes. One person said that sometimes maple driftwood (**sukws**) could be found and it was used to smoke fish if it was dry enough. Nisga’a literature notes the use of **k’ookst** for carving spoons, bows, and snowshoe frames, as well as for making sledge hammers (Nisga’a Tribal Council 1995, Vol. IV, pg. 86), and for making various utensils, including a grease skimmer because it didn’t change the colour of the eulachon grease (McKay et al.1986, pg. 157; Boston et al. 1996). **K’ookst** was also used to carve pegs because it was hard and the tips could be burned to make them sharp (Sim’oogit Ni’isjoohl – Horace Stevens in Mackin 2004, pg. 65). Sticks for **Xsan** (a traditional game) were made from **k’ookst.** The wood for this was cut in the fall after the sap had stopped running because it was drier and less likely to crack (Boston et al. 1996. pg. 93).

Wa'ums – devil's club – *Oplopanax horridus* (Sm.) Miq.

Family: Araliaceae (Ginseng family)

Oplopanax horridus is widely distributed along the Northwest Coast and interior on moist sites, especially on well-drained seeps, throughout Nisga'a traditional territory, from the lowlands to the subalpine.

Food Use

No information was reported or recorded for the Nisga'a use of **wa'ums** for food. The Tlingit of Alaska and the Oweekeno people, whose traditional territory is near Rivers Inlet on the southern coast of BC, ate the spring buds and young stems (Greene 1896; Compton 1993, pg. 85).

Medicinal Use

Wa'ums continues to be highly regarded for medicinal purposes by many Nisga'a across the generations. Every collaborator with whom this plant was discussed knew of at least one medicinal use and many others, young and old, knew its name and that it was an important plant, even if they didn't know the specifics of its use.

One collaborator recalled rules for harvesting **wa'ums** which show how important the plant was to the Nisga'a, as well as the spiritual attitude necessary when harvesting the powerful medicine.

> *You gather four at a time ... but if you take only one, you cut it in four. That's the way we do it ... if you take one you chop it in four. It's got those knots on it where the branches are coming out ... that's where you chop. Just like your limbs ...When you drink this* [medicine prepared from **wa'ums**] *you drink it for four days ... and if you don't feel that good, when another four days is over ... you start it for another four days if you don't feel better* (Sigidimnak' K'igapks – Alice Azak 2007).

Two people mentioned the importance of focusing your mind and body on getting well and not telling others that you were having treatment with **wa'ums** in order for the medicine to work well.

Nineteen people recalled various uses for **wa'ums**, alone or mixed with other medicines. Thirteen people recalled that the stems were used for medicine, first by scraping off the spines. Six people said you could use either the roots or stems. Jeff Benson (2008) recalled that his Grandmother, Agnes Benson, taught him that only the roots should be used, unless you could find a stem without spines, but if you have to harvest in the summer, the root alone should be used.

Eleven people commented that **wa'ums** is meant to be harvested only after the leaves have fallen off in fall and winter. Sigidimnak' Ẃii Ts'iksna'aks (Pauline Grandison 2008) said "it could be picked when the leaves were off and could be picked [throughout the winter] until the leaves opened up again."

Three people said that it was important to wait until the plant had finished flowering before harvesting. One said the medicine is stronger, one said that the smell could overpower you and knock you out, and one said the medicine would be bitter if you picked it when it was flowering. Two people were told that the berries were poisonous.

Generally people said that they preferred to harvest **wa'ums** stems that were tall and straight, about an inch or two in diameter, but said that these were hard to find. One person said it was good to look for an orphaned or lone plant called **neek'im wa'ums** and that he preferred orphans facing north (Sim'oogit Hayḿaas – Chester Moore 2008). Straight big stems were preferred because they make better medicine and are easier to collect and clean (Sigidimnak' K'igapks 2009).

For both external and internal use, preparation was generally described as boiling, despined stems or simmering the roots or shoots in water alone or with other medicinal plants. Parts used were either steeped or boiled until they turned a suitable colour. The suitability of colour was a personal preference. One person said that he prepared the medicine by simmering the roots for 16 hours. Two people said that the roots or stems can be dried, ground or chopped (Sim'oogit Ni'isjoohl – Horace Stevens 2007; Sim'oogit Gadim Galdoo'o – Charles Alexander 2008). One person described how "the old people used to put stems in a cloth and bang it to make the medicine stronger, then they put it in water (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

Abdominal Disorders: Two people said that a decoction made from devil's club stems and/or roots was used as an emetic to clean out the system.

Arthritis/Rheumatism: Six people said that **wa'ums** was used to treat arthritis. Four of them said that they personally use the medicine for arthritis today; two prepared it for other people as well. Whether or not it was mixed with other medicinal plants depended upon personal preference and whether the appropriate ingredients were available. One person said that:

> *A mixture of **wa'ums**, **tiim la<u>x</u>la<u>x</u>'u*** [Labrador tea – *Rhododendron groenlandicum*], *mint leaves* [*Mentha arvensis*] *and cloves* [the exotic spice, *Syzygium aromaticum*, sold in grocery stores] *was taken as a drink to treat arthritis* (Sigidimna<u>k</u>' Sim'oogidim Sigidimna<u>k</u>' – Lavinia Clayton 2008).

Sim'oogidim Sigidimna<u>k</u>' said that in the modern day she only mixes it with **tiim la<u>x</u>la<u>x</u>'u** for arthritis. The inclusion of the exotic cloves in this treatment for arthritis means that this particular concoction was made only after first contact. Just when cloves became available in the Nass Valley needs to be pursued. It is likely that its inclusion in the medicine began in the late 19th century or sometime in the last 100 years, when this spice was more widely available.

Cancer: Three collaborators said that **wa'ums** is used for treating cancer. They could not say with certainty if it was used in the past for this illness or if this was just a modern day use. One person said that he had personally used it to treat his prostate cancer and two people said they make the cancer medicine now for others. Both said that they preferred to mix it with with **ts'ak'a aam** (licorice fern – *Polypodium glycyrrhiza*) or **haxwdakw** (Pacific yew – *Taxus brevifolia*) but that it could be used alone too.

Chest Conditions: One person said that **wa'ums** was good for asthma**.**

Eye Disorders: One person said that taking **wa'ums** was good for your eyesight, especially important when hunting.

Miscellaneous Use: Sigidimna<u>k</u>' K'yaks Sgiihl Anluuhlkw Psday (Deanna Nyce) recalled the following for treating her hyperactive thyroid:

> *"Harry and I came home from university for a visit. Always on our agenda was to stop by and visit Granny and Ye'e Gosnell. During*

> *the course of our sharing our family news with her, I told her about my hyperthyroid issue. She went to the fridge and brought me a drink of* ***wa'ums****. I remember it having a refreshing sweet taste. I was grateful. When we returned to Vancouver and a subsequent visit to the doctor I was removed from the thyroid medication as I no longer needed it."* (pers. comm. 2011).

One person said that he had heard of someone treating a liver disorder with **wa'ums.** Two people said that it was used as a deodorant to neutralize the human scent when hunting and fishing. One person said that it was used as an aphrodisiac.

Skin Disorders: One person said that a concoction with **alda** (*Abies* sp.) or a decoction of **wa'ums** alone was added to a bath to cure and soothe external sores on the body.

Tonic: Five people said that **wa'ums** was used for a general tonic to keep you healthy or to pick you up when you're feeling run down. Two people said today it is used by sports teams when they want to be strong before an important game. One of them said that people take devil's club in capsules, made locally or available in health food stores.

Unspecified Illness: Thirteen people said generally that **wa'ums** was used to treat all kinds of disorders and that "it was good for almost everything." Sigidimnak' Axdii Ksiiskw (Grace Nelson) described its use as follows:

> *When I first got married in 1938, I learned that the devil's club was very valuable for the lives of all, for medicinal purposes. My mother-in-law prepared it for any kind of pain in the body, although we do not know how to do this, we witnessed it being prepared but had no idea this was important. There were very few who knew how to cook the devil's club"* (2008).

Wa'ums was and continues to be widely used for a variety of medical conditions by First Nations throughout the province (Turner and Efrat 1982; Emmons 1991; Compton 1993; Pojar and MacKinnon 1994; Nisga'a Tribal Conncil 1995, Vol. IV, pg. 88; Boston et al. 1996; Lantz 2001; Turner 2004a; Gottesfeld 1992; Johnson-Gottesfeld 1994; and others).

Spiritual/Ceremonial Use

Two people said that in the past people bathed in **wa'ums** before hunting or fishing because it brought good luck. Sim'oogit Gadim <u>G</u>aldoo'o described in detail how it was used in preparation for hunting.

> *We use it for when we go hunting, for a bath....**sisatkw** we call it. You know my grandfather doesn't sleep with my grandmother when he goes hunting. He sleeps alone and in the morning he takes the **ts' iks*** [false hellebore – *Veratrum viride*] *that he dries in winter and he takes the **wa'ums** ...you scrape the bark off it and he builds a fire, takes a bath, way out there somewhere in the bush* [with the **ts'iks** roots] *where no one is going to see him. When he finishes he puts **wa'ums** stems on top of the fire, when it starts to steam, that's when he breaks it and he wishes over it and it always comes true ... you break it open in your mouth. It's the most powerful ... it's called **sisatkw** ... to make you lucky* (2008).

Today, **wa'ums** continues to be widely used for spiritual purposes by many Nisga'a – fourteen people described such use, using the stems with spines removed. Six people said that they put the stems around the house for good luck and eight people said they put stems around the corners of each room in their homes to keep bad spirits away. Sigidimna<u>k</u>' Ẃiit'a<u>x</u> An'un (Belinda Robinson) described a slight variation:

> *... the stems with the spines on, we put them on the stove until it's really hot, then we take the smoking stem around the house to get rid of bad spirits* (2008**).**

Sigidimna<u>k</u>' Hagwiloo<u>k</u>'am saxwhl giis (Irene Seguin) described several recent uses of **wa'ums** for spiritual purposes. She made bracelets from small pieces of the hollow stems to give as gifts at the Stone Moving Feast for her brother Sim'oogit Malga<u>k</u>skw (Peter Squires). She and her sister ceremonially washed their gillnetter boat "Nishga Girl" with a decoction of **wa'ums** before they donated it to a museum.

Technological Use

One person recalled that his father would soak **wa'ums** stems in water for about a week, then wash his fishing nets with the water to neutralize the human scent. One person said that **wa'ums** was used to take bad smells from places or things. For example, it can be used to remove the smell of smoke damage after a house fire. Two people said that they burn **wa'ums** stems on their wood stoves to make the house smell nice.

There were no recollections of technological use in the Nisga'a literature and only one use for technological purposes by other northwestern nations. The Tlingit burned the whole devil's club plant, and used the ashes mixed with water to make a black dye (Osgood 1937, pg. 118). Other nations to the south used the spiny stems to spear octopus and carve fishing lures (Turner and Efrat 1982; Turner 2001a).

Oplopanax horridus has been the focus of many research trials in recent times, prompted primarily by its importance to indigenous cultures for generations (McCutcheon et al. 1992; Lantz et al. 2004a). Research results suggest that the inner bark of devil's club has properties that inhibit the growth of certain bacteria and fungi that cause a variety of illnesses (e.g., tuberculosis and fungal pneumonia; McCutcheon et al. 1994, 1997; Kobaisy et al. 1997). More recent studies suggest that devil's club may have an effect in preventing the further growth of several types of human cancer cells as well as benefits as a tonic and for the treatment of arthritis and rheumatism (Tai et al. 2006; Li et al. 2010; Tai et al. 2010). Dr. Tai's research with respect to the effectiveness of devil's club in the treatment of adult-onset diabetes is not strong to date (Tai, pers. comm. 2011), however other trials suggest that devil's club is hypoglycemic (lowers blood sugar) and so would be potentially useful in the control of diabetes (Small and Catling 1999).

Ts'ak'a tyaýtkw, or **ts'ak'a ts'inhlik'**[26] – beaked hazelnut – *Corylus cornuta* Marsh.
Family Betulaceae (Birch family)
Nisga'a word meaning: literally 'dish of thunder' or 'dish of squirrel'
Corylus cornuta is scattered throughout Nisga'a traditional territory at low to middle elevations on moist to mesic sites. Two collaborators living in Gingolx said that this species was not found in their area.

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[26] from Sigidimnak' Ẃii Ts'iksna'aks (Pauline Grandison).

Food Use

Four people recalled that hazelnuts were eaten. One person described coming home from school and eating the nuts if they could get them before the squirrels. For this reason, they were sometimes referred to as **ts'ak'a ts'inhlik** (denoting nuts for squirrel) (Sigidimnak̲' Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008). Nuts were generally eaten raw, but Sigidimnak̲' Kwhligyoo (Lavinia Azak) said: "My grandmother taught us how to put the nuts in the shell in the ashes of a hot fire to roast them before eating" (2010). None of the collaborators recalled that the nuts were stored for winter use. An elder from another Northwest nation said that their people didn't store the nuts but sometimes would raid the squirrel caches (Richard Jenne, pers. comm. 2011). Literature reviewed says that the nuts were eaten and traded by the Nisga'a (as well as the Gitxsan and Secwepemc) and that "...the nuts were eaten as is, pounded with berries, meat or animal fat into cakes or boiled to extract the oil and used to flavour other foods..." (Turner 1995b; MacKinnon et al.1999, pg. 38).

Medicinal Use

No information was specifically reported or recorded by the Nisga'a for the medicinal use of **ts'ak'a tyaýtkw**. However, MacKinnon et al. (1999, pg. 38) say that"nut milk" was used by the Nisga'a, Gitxsan and Shuswap to cure coughs and colds.

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the Nisga'a spiritual/ceremonial or technological use of **'tsak'a tyaýtkw**. Young suckers were twisted and bent into a kind of rope by some northwestern peoples, and the Gitxsan improvised a type of hockey stick from bent roots and played a game with a flat rock (MacKinnon et al. 1999, pg. 38; Turner 2001a).

Black twinberry; twinberry honeysuckle – (unknown Nisga'a name; maaýa gaak in Western Gitxsan) – *Lonicera involucrata* (Richardson) Banks ex Spreng.

Family: Caprifoliaceae (Honeysuckle family)

Word meaning: the Gitxsan word means 'berries-of raven' – indicating that they are not edible. Possibly this designation is applied to more than one species of berry-like fruits.

This often scraggly shrub grows throughout Nisga’a traditional territory on moist sites.

Food use

One collaborator recalled that the inside of the young stems of honeysuckle (before flowering) were used as a sweetener; the stems were slit with the thumb, dried and stored for future use. She also said that children used to suck on the flowers. Throughout the Northwest, although not considered poisonous, the bitter dark berries were not eaten and given names like “crow berry,” “raven’s food” or “monster’s food” (Pojar and MacKinnon 1994).

Medicinal Use

No information was reported or recorded for a Nisga’a medicinal use of this species. However, other northwestern nations did use honeysuckle for medicinal purposes. The Haida rubbed berries on their scalp to prevent their hair turning grey (Turner 2004a). The Gitxsan applied a poultice from the berry juice or the inner bark for sore eyes (Compton 1993). The Carrier used the inner bark and stems for body sores and general weakness as well as for the eyes (Smith 1929; Johnson-Gottesfeld 1994; Thomas 2004).

Spiritual/Ceremonial Use

No information was reported or recorded for the spiritual or ceremonial use of honeysuckle by the Nisga’a or any other northwestern First Nation.

Technological Use

No information was reported for Nisga’a technological use of honeysuckle. The Haida have a story “How Sounding-Gambling Sticks Won Back His Possessions” where honeysuckle branches are used for gambling sticks (Turner 2004a, pg. 107).

Amhlalxw or **maaỳ hlalxw** – red-osier dogwood – *Cornus stolonifera* Michx
Family: Cornaceae (Dogwood family)

Nisga’a word meaning: the root “**hlal**” is probably related to **hlalp** 'to shave/whittle (wood).' and may refer to the use of the wood. “**Amhlalxw**” would mean ‘good for whittling;’ **maaỳ** refers to the berries.

Cornus stolonifera is a large shrub that can be found throughout Nisga’a traditional territory on wet to mesic sites along streamsides, lakes, swamps, in forests and on disturbed sites from valley bottoms to middle elevations. It is often found on floodplains as the dominant understory species on sites dominated by large cottonwood or spruce trees. It was called "wolf willow" by some of the collaborators, although this common name more widely refers to *Elaeagnus commutata*, which is not found in the Nass.

Food Use

Although no part of the plant was actually eaten by the Nisga'a, five people recalled the use of the branches of **amhlalxw** when cooking eulachons. Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin (2009) said it's called **xbolo'obok** and is a delicacy today that probably few people taste.

> *... clean small branches were cut into little sticks as long as the pot you're using, you line the bottom of the pot with sticks; add a layer of eulachons on the sticks; repeat the layers until you have enough fish; cover in water and boil. This adds a nice flavour* ... [to the eulachons] ... (Sigidimnak' Kwhligyoo – Lavinia Azak 2010).

Literature consulted revealed that the berries, although bitter, were eaten by some interior peoples but not by coastal peoples (Compton 1993; Turner 1997; Moerman 2002).

Medicinal Use

Miscellaneous Use: One collaborator called that the stems of **amhlalxw** were used to help people recover from strokes. He said that the bark was dried and then steeped into tea. Another person said that it was used as a pain medication, but she did not know the specifics of preparation or use.

No other information was reported for Nisga'a medicinal use of **amhlalxw**. However, other Northwest Coast nations had a variety of uses for it. The Wit'suwit'en used the bark for a skin wash, to reduce fever and to control post-partum bleeding (Gottesfeld 1992). The Northern Carrier made a decoction of inner bark for body sores, weakness, headache and toothache (Smith 1929; Thomas 2004) and the Southern Carrier made a poultice from water-soaked inner bark as a painkiller (Carrier Linguistic Committee 1973).

Spiritual/Ceremonial Use/ Technological Use

No information was reported or recorded for Nisga'a spiritual/ceremonial or technological use of **amhlalxw**. The Haida used the thin branches to make frames for drying hides and for sweat house frames (Turner 2004a). Some nations to the south used the branches and leaves for technological purposes (Turner 2001a; Moerman 2002).

Ts'ex – common juniper – *Juniperus communis* L.

Family: Cupressaceae (Cypress family)

Nisga'a word meaning: possibly borrowed from Salishan languages, as the Proto-Salish "ts'ix" translates to "prickly" (Turner 2010).

This species is found throughout Nisga'a traditional territory, mostly on dry open sites at low to high elevations, but it is also found around bogs. It is common throughout British Columbia.

Food Use

No information was reported or recorded for the food use of **ts'ex** by the Nisga'a or any other northwestern nation. In the Southern Interior, the Nlaka'pamux (Thompson) people used small pieces of branches for tea (Turner et al. 1990).

Medicinal Use

Only one collaborator recalled a medicinal use of **ts'ex**.

Tonic: Unidentified parts of **luux** (red alder) were mixed with unspecified parts of **ts'ex** and used as a tonic or to give you energy (Sim'oogit Bayt Ńeekhl – Jacob McKay 2008).

The Gitxsan boiled the entire plants including roots and berries for a day and used the decoction for different ailments which included hemorrhage and kidney problems (Smith 1929). The Tsimshian used this species for general medicinal purposes (McDonald 2003). The Northern Carrier made a decoction of the green tips as a purgative and for coughs while the Southern Carrier inhaled the steam from boiling branches for headaches and chest pain (Smith 1929). The Saik'uz people used the branches and berries for problems of the urinary tract and the heated whole branches are used to treat fractures and sprains (Thomas 2004). Nations further south, especially in the interior, had many medicinal uses for juniper (see Moerman 2002, 2009).

Spiritual/Ceremonial Use

One collaborator recalled that "... you pick the berries of **ts'ex** and tell the Creator what you want and then you eat them, they bring you what you want ..." (Sigidimnak' Alisgum Xsgaak – Diane Smith 2008). In other areas of the region, the Gitxsan used this plant for various ceremonial purposes and rituals (Smith 1929; Johnson 2000; McDonald 2003). The Gitxsan name translates to "boughs of the supernatural" (Johnson 2000).

Technological Use

No information was reported or recorded for any Nisga'a use of **ts'ex** for technological purposes The Tanaina of Alaska used the branches on rocks for aromatic properties (Kari 1985). In the southern part of BC juniper boughs were used as fumigants, especially related to cleaning an area after illness (Turner 2001a).

Tiim laxlax'u – swamp tea, Labrador tea – *Rhododendron groenlandicum* (Oeder) Kron & Judd Family. Ericaceae (Heath family)

Nisga'a word meaning: a literal translation of English 'swamp tea;' **tii** = Eng 'tea', **-m** is a linking suffix (like **-a** in other words), **laxlax'u** or **laalax'u** is 'swamp.'

Rhododendron groenlandicum[27] is found throughout Nisga'a traditional territory in bogs and poorly drained forest sites from low to middle elevations and is common throughout most of BC.

Food Use

The Nisga'a name for this species suggests that its use began post-contact since **tiim laxlax'u** translates to "swamp" (**laxlax'u**) and "tea" (**tiim**). However, one person who thought the tea was definitely used before contact suggested the name could have been something like **aksim** ("drink") **laxlax'u**. **Tiim laxlax'u** is harvested today by many Nisga'a.

Fifteen collaborators reported that the leaves of **tiim laxlax'u** are simmered with water and consumed as a tea, usually taken after a meal. Four people said that the leaves should be harvested in the spring and one said that the leaves can be picked in August. One person preferred to pick the fresh green leaves in the spring because she thought they

[27] Synonymous with *Ledum groenlandicum* Oeder (E Flora BC).

made stronger tea, while another collaborator picked the leaves in the spring because it was easier to see the plants before the other vegetation had sprouted. She only took the growth from the previous year, though, for a stronger beverage and because she thought it was more sustainable to do so. From Laxgaltsap to Gitlaxt'aamiks the Nisga'a sometimes use the English common name "swamp tea" but in Gingolx it is called "mountain tea" where it is more commonly harvested from higher elevations. One young Nisga'a said:

> *The leaves were used to make tea and it is more sacred to pick leaves when the plant is flowering and prepare the tea by boiling the leaves with the flowers* (Simon Calder 2008).

One person said that you can boil the same leaves over and over but the tea can get bitter.

Medicinal Use

Arthritis/Rheumatism: Two collaborators said that **tiim laxlax'u** was mixed with other medicines for arthritis. One person said it was mixed with **wa'ums** (devil's club) and another said that it used to be simmered with mint leaf (Nisga'a name unknown), **wa'ums**, and cloves to ease the pain of arthritis.

Abdominal Disorders: Four collaborators said the tea was taken as a laxative or "to clean you out or to settle your stomach." One cautioned that you had to be careful not to take too much or you could get diarrhea.

Miscellaneous: One collaborator said that the tea was mixed with ginger (an exotic species, *Zingiber officinale*, sold in grocery stores*)* to help cure bladder infections and also to cure colds. One person said that it was used as an aphrodisiac.

Sleep Disorders: Four people said that the tea could help you relax and help you sleep.

Unspecified Illness: Six collaborators said that the tea was generally used for medicine. Further north, the Tlingit made a tea to treat consumption (tuberculosis) by boiling the leaves of maidenhair fern (*Adiantum aleuticum*[28]) and the stems and leaves of Labrador tea (Emmons 1991).

[28] Authority: Rupr. Paris; synonymous with *Adiantum. pedatum* ssp. *aleuticum* (Rupr.) Calder & Roy L. Taylor. Family: Pteridaceae

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for spiritual/ceremonial or technological uses of **tiim la<u>x</u>la<u>x</u>'u** by the Nisga'a or any other northwestern nation.

<u>X</u>laahl – willow species – *Salix* spp. Family: Salicaceae (Willow family)

Ẃaasan – pussy willow – *Salix* ?*discolor* Muhl.

Salix species are scattered on the lava beds and on other disturbed sites and moist areas on Nisga'a traditional territory. Neither the Nisga'a nor most resource inventories identify willows to species, and little information was available about the Nisga'a use of willow. From the distributions noted in E-Flora, MacKinnon et al. (1999) and Pojar and MacKinnon (1994), it is likely that dwarf willows *Salix arctica* and *S. stolonifera* are found at high altitudes on Nisga'a traditional territory, and that other willows such as *S. lucida, S. scouleriana, S. sitchensis* are found throughout Nisga'a lands.

The term **<u>x</u>laahl** refers to willows without catkins (McKay et al. 2001). None of the collaborators could say which willow species were known as **<u>x</u>laahl.** Although *Salix discolor* is the willow species most widely known as "pussy willow," it is likely that any willow when in flowers with fuzzy catkins was known as **ẃaasan**. One collaborator called **amhlalxw** (red-osier dogwood, *Cornus stolonifera*) "wolf willow."

Food Use/Medicinal Use/Spiritual/Ceremonial Use/Technological Use

No information was reported for a Nisga'a use of **<u>x</u>laahl** or **ẃaasan** for food, medicinal, spiritual, ceremonial or technological purposes, nor was there information noted in the Nisga'a literature consulted. However, since two names exist for willow, it is possible that they were used by the Nisga'a. One collaborator recalled that when sun drying eulachons, it is best to remove them before the willows break bud, otherwise the smell from these buds gives eulachons a bitter taste. Another collaborator who knew that aspirin and other pain medicines containing salicyclic acid were based on this compound from willows thought that it was likely that the Nisga'a would have developed a use for willows to control pain, even though she couldn't recall such a use.

The Tlingit used willow stems for making snowshoes (Emmons 1991, pg. 98). Willow species were important to the Tahltan because they provided food for a variety of game (i.e., ungulates) that was hunted by the Tahltan. The poles were also used for certain kinds of animal snares and traps and also for drying game meat, hides and fish, and the green wood of willow was used to smoke food in the smoke house (Albright 1982). The Witsuwit'en used the inner bark of willow for lashing in a manner analogous to the coastal use of cedarbark strips and also for netmaking (Johnson Gottesfeld 1994).

The Tanaina have many willow species on their territory in Alaska. They ate the new growth of inner bark in the early spring. They also used the stems and branches of some small willows as medicine for stomach aches and headaches. They made string from the inner bark of a large willow species, used the long flexible willow stems of young willow as fish hangers and for lashings, and waved willow branches to scare away wolves when walking or running through the woods (Kari 1985, 1995).

Many willow species were widely used by First Nations throughout North America, primarily for medicinal and technological purposes (see Moerman 2002, 2009).

2.3.4.3. *Maaý – berries*

Many "berries"[29] were widely used by the Nisga'a, primarily for food, but some species are considered to have medicinal, spiritual and technological uses as well. As a food, berries were consumed fresh and/or dried for winter use, some were only eaten fresh because they were not suitable for drying, while others were only eaten incidentally or as emergency food, because they were too difficult to collect and/or not highly valued for their taste. Usually the soft berries like raspberries and thimbleberries were consumed fresh and the hard-skinned berries like blueberries or cranberries were both eaten fresh and stored dried for winter use. There were several species that were only considered food for bears, birds and spirits (e.g., **gisgits** – snowberry – *Symphoricarpos albus*). In addition to consuming the berries, the leaves, stems and roots of some species were used in a variety of ways**.**

Berries continue to be an important part of the regular diet for Nass Valley residents and are served at the end of feasts and other traditional gatherings because they

[29] Reference to "berries" includes any small fleshy fruits, including true berries (having many small seeds embedded in fleshy fruit), drupes (with a single large stone surrounded by fleshy fruit, e.g. cherry) and pomes (fleshy fruit enclosing several seeds, e.g. crabapple).

taste good. Collaborators from all four villages mentioned that berries are good for you because they had Vitamin C and other vitamins and minerals (Sigidimnak' K'igapks – Alice Azak 2007; Sim'oogit Gadim Galdoo'o – Charles Alexander 2007; Sigidimnak' Ẃii Ts'iksna'aks – Pauline Grandison 2008; Sim'oogidim Sigidimnak' – Lavinia Clayton 2008). The harvesting of wild berries has diminished over time, as most people grow domesticated varieties in their own gardens, or purchase them at grocery stores**.**

Loots' – red elderberry – *Sambucus racemosa* L.

Family: Caprifoliaceae (Honeysuckle family)

Sambucus racemosa is a large shrub with compound leaves and red berries found on moist to mesic sites throughout the Nisga'a traditional territory.

Food Use

Eleven collaborators said that the fruits of **loots'** are usually mixed with other berries and sometimes eulachon grease and sugar and eaten as **hlayx** One person said they are especially good after eating "Indian meat" (i.e., wild game). Two people preserve them in jars and eat them mixed with other berries. Though they continue to be eaten by some, these berries are not used as widely as in the past. Two people said they could be eaten raw but that they are better cooked. Eight people said that **loots'** berries were fermented to make a strong home brew.

Peoples of the North and Central Coast ate cooked berries of this species in a jam-like confection, and the berries make a good but tart jelly. It is reported that the berries were never eaten raw because they can cause nausea (Turner 1995b, 1997; MacKinnon et al. 1999).

Medicinal Use

Digestive Disorders: One collaborator said that **loots'** was especially valued when mixed with blueberries or huckleberries and served as **ksgalank** (dessert after a main meal) to aid digestion.

Miscellaneous: One collaborator recalled that:

> *... after my grandmother cooked the berries, she used the water as a face and hand cream* [for dry skin] *so she could keep looking young*

> *... she mixed it with some kind of animal fat for beauty cream and perfume, hair oil ... it is called* ***ksimiyukws****. She stored it in a small* ***g̲al'ink̲*** *or crock* (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

Skin Disorders: One person recalled that her grandfather told her he used the roots of **loots'** to treat a cut he got on his shin when out in the woods. He took the roots of **loots'**, scraped off the outside, took the sap from the inside and applied it to a cut to stop the bleeding. A similar use was recalled by Sim'oogit Hlakws (Raymond Calder) who said that the leaves were chopped up and put on cuts (Nisga'a Tribal Council 1995, Vol. IV, pg. 89).

Tonic: Two collaborators said that the berries could be simmered and made into a tea and used for a general tonic.

Unknown: One collaborator said the roots of **loots'** were used for medicine, but she couldn't recall how they were prepared or how they were used. She commented that "the roots smelled so strong they could almost make you run away" (Sigidimnak̲' Alisgum X̲sgaak – Diane Smith 2008). Another person thought **loots'** might have been used for medicine, but she wasn't certain.

Nations further south used the berries, roots and bark of this species for a variety of medical conditions (Turner et al. 1983; Compton 1993; Moerman 2002).

Spiritual/Ceremonial Use

No information was reported for a Nisga'a spiritual use of **loots'**. However, archival records discuss an interesting spiritual or ceremonial use of this species. At an archaeological dig near Lax̲g̲altsap elderberry seeds were found in 16 out of 57 coffins in ancient burials that date back to circa 566-1290 AD (Cybulski 1992). Boas (1916) similarly relates that Tsimshian mythology refers to elderberry as "rich food for the dead," and that is why seeds would be found in coffins (see also Miller 1997).

No additional spiritual or ceremonial use was noted for any other northwestern nation. On southern Vancouver Island, the Ditidaht hollowed out elderberry branches to make ceremonial wolf whistles (Turner et al. 1983). Care should be taken when handling this plant because all plant parts contain a cyanide compound (Turner and Szczawinski 1991).

Technological Use

No information was reported for the Nisga'a technological use of **loots'**. In the Nisga'a literature, Sigidimnak' Nits'iits' Hootkw (Grace Azak) recalls that the stems were used for a counter to keep track of how much oil was siphoned out of the **anjamsnoo** (eulachon grease vat for cooking eulachons; Nisga'a Tribal Council 1995, Vol. IV, pg. 174). She also recalled that the **sk'an loots'** (elderberry bushes) were used to hang the first run of eulachons to dry (Nisga'a Tribal Council 1995, Vol. IV, pg. 175).

Sbiks – highbush-cranberry, mooseberry, squashberry – *Viburnum edule* (Michx.) Raf.
Family: Caprifoliaceae (Honeysuckle family)

Viburnum edule is found on moist sites near streambanks**,** swamps and forests at low to middle elevations throughout Nisga'a traditional territory as well as the rest of B.C. and neighbouring jurisdictions.

Food Use

Ten collaborators said that, like **milkst** (wild crabapple), **sbiks** (berries) were partially cooked and added to whipped **t'ilx** (eulachon grease), mixed with a little water and sugar, and served as a dessert called **hlayx**. This preparation could be stored for the winter. Six people said that the tart berries were also enjoyed fresh; one person said they were treasured because of their high Vitamin C content. One person made jam or jelly with **sbiks.** She also said that "... you can make a good fish dip by boiling the berries with apples or crabapples until very dark ..." (Sigidimnak' Noxs Ẃeen – Peggy Nyce 2008). Another person said that because the berries stayed on the bush a long time, they were eaten incidentally by hunters throughout the year as a thirst quencher as well as an emergency food.

Medicinal Use

Abdominal Disorders: One collaborator recalled that the ripe berries were used to ease general stomach cramps and menstrual cramps. The Upper Tanana people of interior Alaska used the berries for similar purposes (Kari 1985).

Digestive Disorders: One person recalled that the berries were eaten to aid indigestion.

The Gitxsan boiled the bark and twigs to make cough medicine for people with consumption (Smith 1929, Smith et al. 1997). The Tlingit made a lotion by boiling the bark of highbush cranberry for skin disorders (Emmons 1991). The Haida used highbush cranberry for unspecified medicinal purposes (Turner 2004a).

In other areas of the province, the Northern Carrier used the inner bark for dysentery (Smith 1929) and prepared a decoction of the stems for coughs (Carrier Linguistic Committee 1973), while the Nuxalk (Bella Coola) people chewed the bark and swallowed the juice for whooping cough and "colds on the lung."

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the spiritual/ceremonial or technological use of **sbiks** by the Nisga'a. Only the Upper Inlet Dena'ina (Tanaina) people were noted to use the stems of **sbiks** to make rims of birchbark baskets (Kari 1995).

K'apk'oyp – bunchberry – *Cornus canadensis* L. Family: Cornaceae (Dogwood Family)

Cornus canadensis is considered a dwarf shrub because it has a woody base. It can be found throughout Nisga'a traditional territory in moist coniferous and mixed forests and forest openings from valley bottoms to the subalpine.

Food Use

Four collaborators recalled that the fruits were gathered incidentally and eaten fresh or cooked. One person said **k'apk'oyp** were sometimes mixed with other berries as a dessert. This casual use is consistent with that of other northwestern nations.

Medicinal Use

Digestive Disorders: One collaborator said that, like many berries, **k'apk'oyp** could be eaten at the end of a meal to prevent indigestion.

The Northern Carrier used an unspecified part of the plant medicinally and the Southern Carrier made a strong decoction of the plant (without the berries) for an eye wash (Smith 1929). See Moerman (2004) for the medicinal use by other nations.

Spiritual/Ceremonial/Technological Use

No information was reported or recorded for the spiritual or ceremonial use of **k'apk'oyp** by the Nisga'a or any other northwestern nation.

T’ipyees – lava berries – *Sedum divergens* S. Watson

Family: Crassulaceae (Stonecrop family)

Sedum divergens can be found on dry, rocky sites from low to alpine elevations on Nisga’a traditional territory. It is especially abundant on the lava beds near Gitwinksihlkw and is frequently picked by the village residents, but it can also be found in suitable habitat throughout the territory.

Nisga’a word meaning: This word includes “**t'ip”** which means 'straight down', but it could be analyzed **t'i-pyees** rather than **t'ip-yees.**

Food Use

Fourteen collaborators recalled that **t’ipyees** was one of the first foods harvested in the spring. The young, succulent berry-like leaves were eaten raw, ungarnished or with grease and sugar. Once the plants had flowered they were no longer harvested. However, if the growing season was long enough, it was sometimes possible to harvest a second crop. The berries were not stored in the past, although one collaborator was experimenting with storing them in a freezer. Another person said that **t’ipyees** “... went well with burnt dried fish and that in modern times elders mixed **t'ipyees** with apples [the introduced *Malus domestica*, grown in cultivation], sugar and grease and put in a ziplock bag to sell as a fundraiser ...” (Sigidimnak’ Hagwilook’am saxwhl giis – Irene Seguin 2009).

Medicinal Use

Eight collaborators recalled that the succulent leaves were eaten with a drink of water, after meals, to sweeten the breath. They were said to be especially good after eating fish.

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the spiritual/ceremonial of technological use of **t’ipyees** by the Nisga’a or any other northwestern nation.

Is – soapberry – *Shepherdia canadensis* (L.) Nutt.

Family: Elaeagnaceae (Oleaster Family)

Shepherdia canadensis is found in the more interior portions of Nisga’a traditional territory on mesic to dry sites from the lowlands to the subalpine. It was not, however, as abundant on their lands as it was on the territories of some of their interior neighbours (Turner and Burton 2010) and so "... was important in trade especially between Nisga'a and the Athapascan peoples ..." (Sim'oogit Ẃii Gadim X̲sgaak – Eli Gosnell in McNeary 1974a; see also People of 'Ksan1980; Daly 2005; Sigidimnak̲' K'igapks – Alice Azak 2007; Sim'oogit Gadim G̲aldoo'o -- Charles Alexander 2008). **Is** is one of few plant species that continues to be widely known and used by Nisga'a, old and young alike, as well as by other nations throughout British Columbia (Turner and Burton 2010).

Food Use

> *... soapberries were mashed and dried on skunk cabbage leaves and dried over a low fire; rolled and stored for winter ... it was a real chief's food when whipped ...* (Sim'oogit Ẃii Gadim X̲sgaak – Eli Gosnell in McNeary 1974a).

Fourteen collaborators recalled that fresh or dried **is** berries were used to make "soapberry ice-cream" by whipping them by hand, with a little water and sometimes sweetener, until they were the consistency of whipped cream[30]. Three people recalled that prior to the introduction of sugar the berries were sweetened by adding the pith of **haas** (fireweed – *Epilobium angustifolium*). Today, electric mixers are most commonly used and **is** is sweetened with sugar and/or sweet berries or bananas (tropical fruits of the genus *Musa*, widely available in grocery stores). This creation was/is considered a feast food for chiefs, especially enjoyed after a heavy meal (Sim'oogit Ẃii Gadim X̲sgaak -- Eli Gosnell in McNeary 1974a; People of the 'Ksan 1980; Turner 2004a). Three people said that either green or ripe berries could be used for making the dessert. Two people said the berries were eaten unwhipped as well, and enjoyed despite their bitter flavour. Two collaborators said that the berries were made into a drink and one person recalled that the leaves were steeped to make a refreshing tea. Five people said that the berries were fermented to make home brew; one said that "Nisga'a champagne made from soapberries was one of the finest drinks you could make" (Sim'oogit Bayt Ńeek̲hl – Jacob McKay 2008).

[30] Soapberry has a distinctive bitter flavour due to the presence of low levels (ca. 0.74%) of saponins, that give soapberry its characteristic foaming qualities (Turner and Burton 2010).

Medicinal Use

Abdominal Disorders: One collaborator said that the berries or juice could be taken as a laxative to cure constipation.

Arthritis/Rheumatism: Three collaborators said that soapberries could be used for arthritis; two people described the preparation specifically. Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin (2009) said "... the berries were cooked and mixed with sugar to a syrup stage, then a tablespoon of the syrup [taken as a concentrate] or mixed with a glass of water and taken daily for rheumatoid arthritis." Sim'oogit Ni'is Naganuus – Steven Doolan (2008) said he takes "... two spoonfuls of raw frozen soapberries (red or green) in the morning and two at night for arthritis".

Chest Conditions: One person said a decoction prepared by simmering red or green soapberries was used to treat pneumonia.

Digestive Disorders: Four collaborators said that the juice made from **is**, either red or green, is taken to aid digestion. It is also served at the end of meals and feasts in its whipped state because of its ability to assist digestion.

Miscellaneous: One person said a decoction could be prepared to treat typhoid.

Obstetrical and Gynecological Use: Seven collaborators recalled that the berries or juice were used to induce or assist in labour. Sigidimnak' Ẃiit'ax An'un – Belinda Robinson recalled:

> *... berries were squashed so that the juice comes out and mixed with a little sugar, then put in a jar; when you begin labour, if you can't deliver, you take a spoonful of this juice* ... (2008).

Tonic: Three collaborators said a decoction of the juice was taken as a general tonic.

Unspecified: Two people said that the berries were used for medicine, but did not report specific information.

Throughout the Northwest and in the southern part of the province, wherever the soapberry could be found or traded, it was used for a variety of medicinal purposes (Smith 1929; Kari, 1985, 1995; Turner et al. 1990; Smith et al. 1997; also see Moerman 2002, 2009; Turner and Burton 2010).

Spiritual/Ceremonial Use

No information was reported or recorded for the spiritual use of **is** by the Nisga'a or any other northwestern nation. There are some records of ceremonial use by people living in the southern areas of the province (Turner et al. 1990; see Moerman 2002).

Technological Use

One collaborator said that the roots of **is** were dried and mixed with *Xanthoria* sp. (orange rock lichen) to make a dye for canoes. There was no additional information recorded on technological use by the Nisga'a or any other northwestern nation.

T'imiy̓t – kinnikinnick, common bearberry – *Arctostaphylos uva-ursi* (L.) Spreng.

Family: Ericaceae (Heath Family)

Arctostaphylos uva-ursi is found on Nisga'a traditional territory from lowlands to lower alpine elevations in dry forests and exposed rocky areas; it is abundant on the lava beds.

T'imiy̓t is similar in appearance to *Vaccinium vitis-idaea* (mountain cranberry), which has been identified by collaborators as **sk̲'ant'imiy̓t**. **Sk̲'an** translates to mean "bush" but it can also mean "support" (McKay et al. 2001; Sigidimnak̲' K'igapks – Alice Azak 2010; Tarpent pers. comm. 2010). Kinnikinnick and mountain cranberry have many similarities, but there are distinguishing characteristics in their growth forms: kinnikinnick is always a low, creeping shrub while mountain cranberry has upright shoots 10-20 cm in height. To complicate matters further, *Oxycoccus oxycoccos*[31] (bog cranberry) has also been called **w̓ii pdalks** during the course of this research. However, based on the growth forms of *Arctostaphylos uva-ursi* and *Vaccinium vitis-idaea* and the literal translation for **w̓ii pdalks (**noted below in the sections on *Oxycoccus oxycoccos*), it seems reasonable to conclude that **t'imiy̓t** refers to *Arctostaphylos uva-ursi* (kinnikinnick), **sk̲'ant'imiy̓t** refers to *Vaccinium vitis-idaea* (mountain cranberry) and **w̓ii pdalks** refers to *Oxycoccus oxycoccos* (bog cranberry).

Food Use

Five collaborators recalled that **t'imiy̓t** were stored for winter in grease and sugar and eaten as a dessert called **hlayx̲**. Alternatively, **dayks** was made by mixing the dried fruit

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[31] Synonyms for *Oxycoccus oxycoccos* are *Vaccinium microcarpum and V. oxycoccos* (E Flora).

with snow and sugar. Two people called the fruits “hard little apples” and said that they were hard but if you picked them after a frost, they were “fluffy.” Sim’oogit Gwingyoo and Sigidimnak’ Niysk’ankw’ajikskw (Abraham and Lucy Williams) recalled similar preparation and use (McNeary 1974a) as did other northwestern nations (People of ‘Ksan 1980; Emmons 1991; Turner 1995b, 1997). The Carrier mixed the dried leaves with tobacco for smoking (Carrier Linguistic Committee 1973).

Medicinal Use

No information was reported or recorded for a Nisga’a use of **t'imiýt** for medicinal purposes. The Carrier made a poultice of the leaves and stems for various skin disorders (Carrier Linguistic Committee 1973); the Saik’uz used the whole plant for urinary tract disorders, to ease childbirth and for menstrual cramps (Thomas 2004). Other interior nations in British Columbia and throughout North America used this species for medicinal purposes (Moerman 2002, 2009).

Spiritual/Ceremonial/Technological Use

No information was reported or recorded for the Nisga’a use of **t'imiýt** for spiritual/ceremonial or technological use. The Haida mixed the dried leaves with tobacco “to eke out the precious narcotic” (Dawson in Turner 2004a).

[An] jaxwas – salal – *Gaultheria shallon* Pursh. Family: Ericaceae (Heath family)

Gaultheria shallon is primarily a coastal species and is found in scattered dry to wet forests near Gingolx at low to middle elevations.

Nisga’a word meaning: jaxwas is 'salalberries', so **anjaxwas** (= **sk'anjaxwas**) might mean 'salal (bush)', unless it should be **ansijaxwas** 'place for picking salalberries.'

Food Use

Two collaborators said that **jaxwas** were not abundant on Nisga’a territory but they were harvested and eaten fresh or dried or stored. One person thought that perhaps the berries were made into a “strong homebrew.” One person said that the leaves were boiled and made into a tea. In the Nisga’a literature, Sim’oogit Gwingyoo (Abraham Williams) said “**anjaxwas** was important on the coast but doesn’t get upriver and people did not like to eat it” (McNeary 1974a). Boston et al. (1996) note that the berries were collected as part of the seasonal round. In more southerly regions of the Northwest Coast, where this species is more abundant, salal berries were routinely eaten fresh and dried for winter use (McDonald 2003; Turner 2004a). In modern times, people make jam or jelly from salal berries (Turner 1995b).

Medicinal Use

One collaborator said that the leaves were boiled for tea, but she was not sure if it was for medicine or enjoyment. No other information was reported for a Nisga'a use of **anjaxwas** for medicinal purposes, nor was there any information in the Nisga'a literature consulted. In other areas, the Nuxalk toasted the leaves, then pulverized them and applied the preparation to small cuts and other wounds (Smith 1929).

Spiritual/Ceremonial Use

No information was reported for the use of **anjaxwas** for spiritual or ceremonial purposes by the Nisga'a or any other northwest peoples.

Technological Use

No information was reported or recorded for a Nisga'a use of **anjaxwas** for technological purposes. The Haida put the leaves between salmon to help preserve them (Turner 2004a) and the Gitga'at put the leaves between seaweed when storing them in cedar boxes and the branches are sometimes used to whip soapberry (Turner and Thompson 2006). In southwestern BC the branches with leaves attached were put between layers of fish heads so they wouldn't stick together and the branches and leaves were used to whip soapberry (Turner and Efrat 1982).

T'axt'ook or **maaý k'ask'aaw**[32] **–** false azalea, buckbrush – *Menziesia ferruginea* Sm.

Family: Ericaceae (Heath family)

Menziesia ferruginea is found on Nisga'a traditional territory on the edge of moist forests from the lowlands to the subalpine zones, but is more common on the coast and at higher elevations.

[32] Two names were given for this species. It was not possible to determine which one refers to false azalea or if there were two names for the same plant.

Nisga’a word meaning: **t'a<u>x</u>t'oo<u>k</u>** is originally a plural form of the verb **t'oo<u>k</u>** which means 'to suck on/at something outside the mouth.’

Food Use

There was no reported use of **t’a<u>x</u> t’oo<u>k</u>** for food. Nisga’a literature notes that children use to suck the nectar from the flowers (McNeary 1974a).

No information was reported for food use by other northwestern nations nor any other First Nation in North America (Moerman 2002). The berries are considered inedible (Pojar and MacKinnon 1994; MacKinnon et al. 1999; Turner 2004a).

Medicinal Use

No information was reported or recorded for a Nisga’a use of **t’a<u>x</u> t’oo<u>k</u>** for medicine. The Haida used shoots of buckbrush (their English term for this species) as an underarm deodorant (Turner 2004a).

Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga’a use of **t’a<u>x</u> t’oo<u>k</u>** for spiritual or ceremonial purposes. In other areas of the Northwest, the Massett Haida placed branches and stems of this species under [recently deceased] bodies to prevent the spread of disease or more deaths (Newcombe in Turner 2004a). The Haida also used the shoots of this species in a puberty ritual to induce modesty in young women (Swanton in Turner 2004a).

Technological Use

No information was reported or recorded for a Nisga’a use of **t’a<u>x</u> t’oo<u>k</u>** for technological purposes. The Haida used the charcoal from buckbrush for tattooing (Curtis in Turner 2004a).

Gam – Saskatoon berry – *Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem.

Family: Rosaceae (Rose family)

Amelanchier alnifolia is found on Nisga’a traditional territory at low to middle elevations in dry to moist forests (especially deciduous or mixedwood forests), on open hillsides, along roadsides and other open or lightly shaded locations on well-drained soils.

Food Use

Eleven collaborators recalled that **gam** fruits were harvested and eaten fresh and dried as a dessert throughout the winter. Three people said they were mixed with grease for storing and one person said that the grease was especially important because the berries were dry. Nisga'a literature notes that **gam** fruits were dried and stored with grease (Nisga'a Tribal Council 1995, Vol. IV). The berries were also an important food source for interior nations in the Northwest and in the southern part of the province (Albright 1982; 1984; Turner 1995b, 1997; MacKinnon et al. 1999; also see Moerman 2002).

Medicinal Use

No specific information was reported or recorded for a Nisga'a use of **gam** for medicinal purposes. However, several collaborators said that all berries are good for your digestion and general health. Several nations to the south use the berries, leaves, roots and stems for a number of ailments (Steedman 1928; Turner et al. 1980; Turner et al. 1990; see Moerman 2002).

Spiritual/Ceremonial Use

No information was reported or recorded for the spiritual or ceremonial use of **gam** by the Nisga'a or any other northwest peoples.

Technological Use

No specific information was reported for a Nisga'a use of **gam** for technological purposes, although several collaborators and Nisga'a literature note that the juices from many kinds of berries were used for dye (Boston et al. 1996). The Tahltan, Gitxsan and Carrier peoples made arrow shafts from Saskatoon stems (Albright 1982, 1984; MacKinnon et al. 1999; Turner 2001a). The Carrier made slat armour and shields from the stems (covered with animal skins). The stems were also used for making digging sticks, spears, and harpoon shafts; twigs were used as fish spreaders; small"green" branches were used in birch cooking baskets to prevent the bottoms from getting too hot (Turner 2001a).

Snax – black hawthorn – *Crataegus douglasii* Lindl. Family: Rosaceae (Rose family)
Nisga'a word meaning: the word occurs in the name of the Grizzly subtribe of the Laxgibuu [Wolves], **Gitsk'ansnaat**, where the **snaat** part is from **snax-t**
Crataegus douglasii is found on Nisga'a traditional territory on moist to mesic open sites, along forest edges, shorelines and streambanks from low to middle elevations.

Food Use

Nine collaborators recalled that **snax** fruits were harvested and dried for use throughout the winter. One person said that like **gam**, **snax** were considered dry and so were stored in grease. One person recalled that they were found growing all over Old Aiyansh. Nisga'a literature confirms the harvesting and use of **snax** for winter storage (Boston et al. 1996). Sigidimnak' Ne'jiits Hoostkw (Grace Azak) noted that **snax** were pulverized to break the seeds before they were dried (Nisga'a Tribal Council 1995, Vol. IV, pg. 191).

Medicinal Use/ Spiritual/Ceremonial Use/Technological Use

No specific information was reported or recorded for the Nisga'a use of **snax** for medicinal/spiritual or technological purposes.

To the south, the Nlaka'pamux (Thompson) peoples used the thorns for prongs on rakes for catching herring, piercing ears, probing blisters and boils, for fish hooks and as playing pieces for games. The hard wood was generally used by First Peoples for tool handles and digging sticks (Steedman 1928; Turner et al. 1990; Pojar and MacKinnon 1994; Turner 2001a).

Miigunt – wild strawberry – *Fragaria virginiana*[33] Duchesne;
Woodland strawberry - *Fragaria vesca L.* Family: Rosaceae (Rose family)
Fragaria virginiana is found on Nisga'a traditional territory in moist to dry meadows, along roadsides, on grassy slopes, forest edges and open forests from low to subalpine elevations.

Food Use

Thirteen collaborators recalled that the berries from **miigunt** were eaten whenever they

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[33] Although technically not a shrub, *Fragaria* spp. are included under shrubs because they produce a berry-like fruit (namely, a drupe).

were found, but that it was difficult to find them or get them before the birds ate them all. Other northwestern nations also ate the berries of *Fragaria virginiana* and other *Fragaria* species, primarily consuming them fresh (People of ‘Ksan1980; Albright 1982; Smith et al. 1997; Turner 1995b, 1997, 2004; Turner and Thompson 2006).

Medicinal Use

Two collaborators said that **miigunt**, like all berries, were good for you and were eaten to help keep you healthy. No other information was recorded in the Nisga’a literature.

In other areas of the Northwest, the Haida used the leaves of *Fragaria chiloensis* (L.) Mill (coastal strawberry) for different medicinal purposes, including a women’s tonic (Pojar and MacKinnon 1994; Turner 2004a). The Carrier made a decoction of the stems to treat bleeding of the stomach (Carrier Linguistic Committee 1973). Generally, First Nations used strawberry leaves to make a good tea for treating diarrhea (Pojar and MacKinnon 1994; Moerman 2002, 2009).

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for any use of **miigunt** for spiritual, ceremonial or technological purposes by the Nisga’a or any other northwestern nation.

K’alams – Nootka rose – *Rosa nutkana* C. Presl. Family: Rosaceae (Rose family)

Nisga’a word meaning: probably a word of Salishan origin such as *k'walams* (Tsimshian is ***k'walaams***).

Rosa nutkana is found on moist to mesic sites along forest edges, in clearings, and along riverbanks, shorelines, streambanks and roadsides at low to middle elevations.

Food Use

K’alams fruit was mixed with grease, was only eaten casually and was not considered good food (Sim’oogit Gwingyoo (Abraham Williams) and Sigidimnak’ Niysgankw’ajikskw (Lucy Williams) in McNeary 1974a; Nisga’a Tribal Council 1995, Vol IV, pg. 194). Eight collaborators said that **k’alams** fruits (“rose hips”) were eaten, but five recalled that you had to be careful to eat the outer part only because eating the whole fruit (i.e., including the seeds) irritates the digestive tract and gives you an itchy bottom. The caution against eating the seeds from rosehips was common knowledge amongst many nations with access to this species (Pojar and MacKinnon 1994). Five people said that you could make jam from the fruit; two said that the fruit was boiled to make tea; two people said the fruit was high in Vitamin C and two said that the fruit was used to make homebrew.

Medicinal Use

Arthritis/Rheumatism: One collaborator recalled that the fruit of **k’alams** was boiled and put through a strainer, then taken as a drink to relieve the pain of arthritis.

Skin Disorders: One collaborator reported that the seeds of **k’alams** were mixed with “balsam sap” (the resin from fir trees) and used to extract poison from boils.

> *My grandmother used to say “go out and see if there is little yummy berries” – people call it yummy berries. There are lots of little stones in it. "Pick one and we'll open it," she said, and then we put it on the gum* [from] ***alda*** or ***ho’oks*** [*Abies lasiocarpa* or *A. amabilis*], *on a piece of paper or cloth and then we put that on the boil. That's how they are going to open it. She took out two small little stones from inside this berry thing (**k’alams**) and they put it on there and it was there all day and then you feel it, when you open it, the pus starts running. And they look at it and sure enough, it (the boil) opens up. That's how they open the boil or whatever* (Sigidimnak’ Hlgu Wilksithlgum Maaksgum Hlbin – Emma Nyce 2008).

In other areas of the Northwest, the Carrier used a decoction of the roots to treat sore eyes (Carrier Linguistic Committee 1973). Many nations to the south used the bark, leaves, flowers, stems and roots to treat a variety of ailments (Turner et al. 1980, 1983, 1990; see Moerman 2002, 2009 for details).

Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga’a use of **k’alams** for spiritual or ceremonial purposes. Some nations to the south used the branches to bring good luck and drive away bad spirits (Turner et al. 1990; see Moerman 2002).

Technological Use

One person said that the branches of **k’alams** were used to prepare eulachons.

Blueberries – *Vaccinium* species.

Family: Ericaceae (Heath family)

Vaccinium species or “blueberries” were highly regarded by all collaborators, although species identification was not always precise. One collaborator when shown a *Vaccinium* sample, said “...I don’t know which one this is....they’re all just blueberries and are good to eat...” (Anonymous 2008). The difference between the species was probably well known at one time, because almost all of the species have been uniquely assigned a Nisga’a name or names.

In the past, blueberries were enjoyed fresh but were also dried on racks over a slow-burning fire, then wrapped in leaves of **hiina<u>k</u>** (*Lysichiton americanus* – skunk cabbage) and stored in **gal'in<u>k</u>** (bentwood boxes) for winter use. In modern times, many Nisga’a pick wild blueberries but preserve them in jars or freeze them for use throughout the winter. Some pickers prefer one species over the other, but people are generally now content just to pick and preserve any wild blueberries.

Although blueberries were primarily used for food, they (along with other edible berries) were considered by most collaborators as a “general medicine” because they are “good for you,” “have lots of vitamin C,” and that “eating most kinds of edible berries helps digest food after a big meal.” For technological purposes, there are a few general references for the use of blueberries for dyes, but no other technological uses and there are no records of their use for spiritual or ceremonial purposes.

Ẃii pdalks – bog cranberry – *Oxycoccus oxycoccos* (L.) MacMill.

Nisga’a word meaning: ẃii translates to **‘**great or high tide’ **pdalks** translates to ‘to be in high tide’ (McKay et al. 2001).

Oxycoccus oxycoccos, also known as *Vaccinium oxycoccos,* is found growing with sphagnum moss in bogs at low to middle elevations in swampy areas on Nisga’a traditional territory and is widespread thoughout the Northwest on suitable habitat.

Two species, *Oxycoccus oxycoccos* and *Vaccinium vitis-idaea* (mountain cranberry), were called **ẃii’ pdalks** by collaborators. Given the translation and the fact that the berries of both species are similar in taste and size, have "cranberry" as part of their common name and can be found in similar wet habitats, the name could reasonably refer to either or both species (but see discussion above in the section on **T'imiỳ́t**, kinnikinnick).

Food Use

No specific information was reported for a Nisga'a use of **ẃii' pdalks** for food, although two people said that if the berries were good to eat, they would have been eaten or stored. Nisga'a literature notes that the berries were mixed with eulachon grease to preserve them, and they were whipped with snow when serving them in the winter (Sim'oogit Gwingyoo – Abraham Williams, and Sigidimnak̲' Niysgankw'ajikskw – Lucy Williams, in McNeary 1974, 1976).

Other nations in the Northwest and throughout BC used the berries in similar fashion (Turner 1995b, 1997; Moerman 2002).

Medicinal Use/Spiritual/Ceremonial Use

No information was reported or recorded for the use of **ẃii' pdalks** for medicinal or spiritual/ceremonial purposes by the Nisga'a or any other northwestern nation.

Technological Use

No information was reported for a Nisga'a use of **ẃii' pdalks** for technological purposes. Literature records that the berries were used for a purple-red dye by both the Nisga'a (Emmons 1991) and the Tlingit (Boston et al. 1996).

Maaý – Alaskan blueberry – *Vaccinium alaskaense* Howell.

Nisga'a word meaning: **maaý** means 'berries'

Vaccinium alaskaense is primarily a coastal species which grows on moist to mesic sites from low to subalpine elevations. It is common throughout Nisga'a traditional territory.

Food Use

No information was reported or recorded for a Nisga'a use of this particular species for food. General comments for its use by northwestern peoples note that the berries were eaten fresh or dried but that their flavour was considered inferior to that of *Vaccinium ovalifolium*, a blueberry similar in appearance (Turner 1995b).

Medicinal/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisga'a use of this particular species for medicinal, spiritual or technological purposes.

Ḿiyahl – dwarf or Canadian blueberry – *Vaccinium caespitosum* Michx. orth. var.

Nisga'a word meaning: ḿiyahl may be from a Tsimshian word; the Southern Tsimshian word is **mihaahl.** This spelling suggests that the word is not related to **yahl -** 'to be slippery, slimy'.

Vaccinium caespitosum can be found on Nisga'a traditional territory on dry to wet sites in forests, bogs, meadows, and rocky ridges from lowland to alpine zones.

Food Use

Two collaborators knew **ḿiyahl** specifically and one of them described the berries as "slightly grey and very sweet" (Sigidimnak' K'igapks – Alice Azak 2010). Another person recognized the name **ḿiyahl**, but she couldn't recall which blueberry it represented.

Medicinal/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisga'a use of **ḿiyahl** for medicinal, spiritual or technological purposes nor was there information in the Nisga'a literature consulted.

Simmaaý, **maaýim gililx**, **maaýim [lax]-sgańist**, **miigaanii** – black huckleberry – *Vaccinium membranaceum* Douglas ex Torr.

maaýim gililx, **maaý**, **huksa'alt**[34], **miigaanii** – oval-leafed blueberry – *Vaccinium ovalifolium* Sm.

Nisga'a word meanings: simmaaý is 'best, ideal, berries'; **maaýim gililx** is **'**berries-of up-the-hill' (as opposed to the location of the village near the river); **maaýim [lax]-sgańist** is **'**berries-of mountain'; **miigaanii** means 'like **miigaan**' (suffix **-ii** 'like'), **miigaan** is one name for 'black huckleberry,' so **miigaanii** is a description "it looks like a **miigaan**."

[34] huksa'alt was a word retrieved from one source, but may represent an error in species identification.

These two distinct species are presented together because their uses are very similar. In addition, they both have more than one Nisga'a name and have both been called "**maaýim gililx**," "**simmaaý**," "**maaýim [lax̱]-sganist**," or "**miigaanii**" by one or more collaborators, although the same name was never given to both species by anyone.

Simmaaý was the name most commonly given by collaborators for *Vaccinium membranaceum* (black huckleberry). One collaborator said that **simmaaý** was the name for black huckleberry and the other one **(***V. ovalifolium* **–** oval-leaved blueberry) was just called **maaý** (berry). **Simmaaý** is also the name used by the Gitxsan for the *Vaccinium membranaceum* (Aboriginal Education Centre n.d.).

The Nisga'a word "**maaýim gililx**" (berry from the hill) was also used to identify both *Vaccinium membranaceum* and *V. ovalifolium* by different collaborators. Since both species are more common on mountainsides than in the valley bottoms, the name could reasonably refer to either species. However, one collaborator said *Vaccinium membranaceum* was also called mountain blueberry. In the Nisga'a literature, Ni'is-bakhl (Robert Moore) uses the Nisga'a name "**maaýim lax̱-sgańist"** to describe an especially valued blackberry, like a blueberry that grows up high in the mountains (Nisga'a Tribal Council 1995, Vol. IV, pg. 78**).**

Although both of these species can be found at high elevations (E Flora BC, Pojar and MacKinnon 1994), because *Vaccinium membranaceum* has a darker, blacker berry and its occurrence increases with elevation (E-Flora BC; Elman and Peterson 2005), it is reasonable to conclude that **maaýim sgańist** refers to *V. membranaceum* and is synonymous with **simmaaý**, while **maaýim gililx** refers to *V. ovalifolium*.

Food Use

Fifteen collaborators recalled that the berries from **simmaaý** and **maaýim gililx** were harvested and eaten. Four people mentioned that in the past the berries were eaten fresh while today they are preserved in jars whole or made into jam, or frozen. Three people recalled that blueberries were mixed with other berries as well as being served on their own; two people said the dried blueberries were mixed with eulachon grease when served. Both huckleberries and blueberries were harvested as part of the traditional round (Nisga'a Tribal Council 1995, Vol. IV; Boston et al. 1996). These berry species were harvested almost universally by northwestern coastal and interior First Nations when they were available (Turner 1995, 1997).

Medicinal Use

Chest Conditions: One person recalled hearing that she saw a woman cure a bad cold and cough by drinking half a pint of boiled blueberries and choke cherries.

Digestive Disorders: Six collaborators reported that eating most kinds of blueberries and other edible berries helps digest food after a big meal.

Miscellaneous Use: Six people reported that that eating blueberries or drinking blueberry juice is good for you**.**

Spritiual/Cermonial Use

No information was reported or recorded for the use of **simmaaý** or **maaýim gililx** for spiritual or ceremonial purpose by the Nisga'a or any other northwestern nation.

Technological Use

One collaborator reported that his grandfather made paint with berries, and that he mixed blueberries with blood from animals used to make some dyes (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008). It is generally acknowledged that the Nisga'a used the juice of various berries to make dyes (Boston et al. 1996).

Throughout the Northwest, blueberries were used to make purple dye (Emmons 1991, pg. 457). The Haida used the wood from older *Vaccinium ovalifolium* (and *V. alaskaense*)[35] for making pegs used like nails when making cedar boxes (Turner 2001a, Turner 2004a). No other information was reported or written for the use of these species.

Ẃihleeks – red huckleberry – *Vaccinium parviflorum* Sm.

Vaccinium parviflorum is found from low to middle elevations on dry to moist forests and on decaying wood and stumps. On Nisga'a traditional territory, it is more abundant near the coast around Gingolx but can be found throughout the territory on suitable sites.

Food Use

Fourteen collaborators recalled that **ẃihleeks** berries were picked and eaten fresh or dried for winter use; two people said they were good with grease. Three people said that the

[35] *Vaccinium membranaceum* is not found on Haida traditional territory.

berries were more common on the coast, one recalling that there used to be a lot of them around Gitlax̲t'aamiks (New Aiyansh) and that they grow when you first clear land (Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008).

Other Northwest nations used the berries for food in similar ways (Albright 1982, 1984; People of 'Ksan 1984; Emmons 1991; Pojar and MacKinnon 1994; Turner 1995b, Turner 2004a; also see Moerman 2002).

Medicinal Use

No specific use was reported or recorded for the use of **ẃihleek̲s** for medicinal purposes. Collaborators did include this species when discussing berries that "assisted in digestion" and were "good for you."

In other areas of the Northwest, a decoction of the leaves and stems was prepared and used as a gargle to soothe sore throats and gums (Pojar and MacKinnon 1994) and the Haida were noted to use the stems medicinally (Newcombe 1897).

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisg̲a'a use of **ẃihleeks** for spiritual, ceremonial or technological purposes. In other areas, the leaves were dried and smoked by the Nlaka'pamux (Thompson) people (Steedman 1930), and the Kwakwaka'wakw people used the twigs to attach skunk cabbage leaves used to cover berries in baskets (Turner and Bell 1973).

Sk̲'ant'imiẏt or **ẃii pdalks** – mountain cranberry, lingonberry – *Vaccinium vitis-idaea* L. See *Arctostaphylos uva-ursi* (kinnikinnick) and *Oxycoccus oxycoccos* (bog cranberry) for discussion on species identification and Nisg̲a'a names.

This circumboreal species is found on Nisg̲a'a traditional territory, most commonly in the interior in wet to dry forests, in bogs from lowland to alpine zones.

Food Use

Only one collaborator identified this species with certainty and she thought it was called **sk̲'ant'imiẏt**, but said it might be called **ẃii pdalks** by some people. Two other people weren't sure if they recognized the plant, but said if it had good berries they would eat them. The berries were harvested across the Northwest for food, by the Tlingit, Haida, Tahltan, Dena'ina and Aleut people (Albright 1984, 1986; Kari 1985, 1995; Emmons, 1991; Pojar and MacKinnon 1994; Turner 1995b, 2004; Veltre et al. 2006).

Medicinal Use/ Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisga'a use of **sk̲'ant'imiy̓t** for medicine, spiritual, ceremonial or technological purposes. In other areas of the Northwest, the Dena'ina (Tanaina) used warmed berries wrapped and placed in the appropriate place to relieve headaches, sore throats, and tonsillitis. They also gargled with berry juice to relieve sore throats (Kari 1995).

The leaves of *Vaccinium vitis-idaea* ssp. *minus* were dried and smoked by the Inuktitut, and the Cree used the berries for necklaces and as a dye (Moerman 2002).

Currants and Gooseberries – *Ribes* species

Family: Grossulariaceae (Currant Family)

Wik'il – stink currant – *Ribes bracteosum* Douglas ex Hook.

Ribes bracteosum is found throughout Nisga'a traditional territory in moist to wet places in coniferous forests, along streambanks, shorelines and thickets from low to subalpine elevations.

Dilus – black gooseberry – *Ribes lacustre* (Pers.) Poir

Ribes lacustre is a found throughout Nisga'a traditional territory on moist to dry sites in moist woodlands, along streambanks, in open forests, on forest edges and rocky outcrops from middle to alpine zones.

Maay̓im lax̲ anduuyin, **t'ist'uuts'gum maay̓ –** trailing black currant **–** *Ribes laxiflorum*

Nisga'a word meaning: Maay̓im lax̲ anduuyin means 'berries-on' 'the garden,' suggesting that the plant is an import or escape; **T'ist'uuts'gum maay'** means 'black berries.'

Ribes laxiflorum is found throughout Nisga'a traditional territory along moist cliffs and rock slopes, along forest edges, roadsides and in clearings from low to middle elevations.

Food Use

Eleven collaborators recalled that fruits of these three species, **dilus, wik'il** and/or **maaý́im la<u>x</u> anduuyin**, were either eaten fresh or dried and stored for winter use. One person said that the dried berries were mixed with grease when eaten. Four people said the berries were put up in jars or made into jam or jelly. One person said that **dilus** was mixed with **haadiks (**hemlock inner bark) and one person living in Gingolx said that **dilus** was harvested and eaten but that it was very scarce. Nisga'a literature confirms these uses (Nisga'a Tribal Council 1995, Vol. IV; Boston et al. 1996).

One person recalled that all these berries and other berries too were grown in gardens and were traded with other nations, recalling that "... Skeena River women brought both berry bushes and trees for gardens to trade for grease ..." (Sim'oogit Ni'isjoohl – Horace Stevens 2007). Two people said that a cultivated variety of gooseberry was grown by people in the present day in their own backyards.

Medicinal Use/Spiritual/Ceremonial Use/Technological Uses

No information was reported or recorded for a Nisga'a use of **dilus, wik'il** or **maaỷ lax anduuyin** for medicinal/spiritual/ceremonial/ technological purposes.

The Gitxsan prepared a decoction of the bark from *Ribes lacustre* for an unspecified malady (Smith 1929). Nations to the south used the berries, leaves, bark or roots of this species for a variety of medicinal purposes, ranging from eye medicine, muscle cramps, general body aches and gastrointestinal disorders (Steedman 1928; Turner and Bell 1971; Turner et al. 1990; Compton 1993; also see Moerman 2002). The berries of *Ribes bracteosum* were used for treating sexually transmitted diseases and skin disorders (Smith 1929; Compton 1993). A decoction of *Ribes laxiflorum* roots was used by the Nuxalk (Bella Coola) people as an eyewash (Smith 1929; see also Moerman 2002).

Nations to the south used the roots and stems of currants for making ropes and nets and the stems for making pipes for smoking (Turner and Bell 1971; Turner and Efrat 1982; Turner 2001a; also see Moerman 2002).

Raspberries – *Rubus* species
Family: Rosaceae (Rose Family)

Naasik' – red raspberry **–** *Rubus idaeus* L.

Rubus idaeus is found on Nisga'a traditional territory from low to middle elevations on dry to moist sites. It grows well on disturbed sites and can be found throughout the lava beds as well as in other clearings and open forests.

Food Use

Eleven collaborators said that **naasik'** were among the first berries harvested in the summer. Two said that traditionally the berries were dried but one person thought they were too soft to dry for winter use but were enjoyed fresh, mixed with grease and sugar. Four people said when jars became available, people began to make jam from them. Today many people pick **naasik'** the berries, but often they are picked from domesticated varieties being grown in cultivation rather than growing in the wild.

Throughout the Northwest, red raspberries were harvested and eaten fresh or dried (Kari 1985, 1995; Emmons 1991; Pojar and MacKinnon 1994, Turner 1995b).

Medicinal Use

Digestive Disorders: As noted previously, all edible berries were eaten alone or mixed with other berries because they are good for your digestion, especially after eating anything difficult to digest.

Obstetrical and Gynecological Use: One collaborator said that leaves from **naasik'** were made into tea to help with childbirth and that the berries were eaten for stomach cramps and women's problems.

Tonic: One collaborator said that she thought that her grandmother used the leaves and berries of **naasik'** to make a general health tonic. She used to make a tonic for her children from the berries and made tea from the leaves; she now uses **naasik'** in the same way to make tonics for her grandchildren.

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of use of **naasik'** for spiritual, ceremonial or technological purposes by the Nisga'a or any northwestern nation.

Naasik' or **maaý̓im hagwiluxw –** blackcap raspberry – *Rubus leucodermis* Douglas ex Torr. & A. Gray

Nisga'a word meaning: hagwiluxw means means 'rope', so **maaý̓im hagwiluxw** means 'berry of ropes, ropeberry'

Rubus leucodermis is found on Nisga'a traditional territory on moist to dry sites, in clearing rocky slopes, open forests from low to middle elevations.

Maaý̓im hagwiluxw is identified as trailing wild blackberry in the Nisga'a Dictionary (McKay et al. 2001) but this common name "trailing blackberry," usually refers to *Rubus ursinus* subsp. *macropetalus* (Douglas ex Hook.) Roy L. Taylor & MacBryd. This species may occur sporadically in the study area but is found primarily in the southern half of the province. Since the berries of these two species look similar when ripe, it is more likely that **maaý̓im hagwiluxw** refers to *Rubus leucodermis* (blackcap raspberry) which is found on Nisga'a traditional territory and can appear to trail when the stems arch back to the ground and root at the tips (E Flora BC).

Food Use

Only one collaborator knew the Nisga'a name **maaý̓im hagwiluxw** for *Rubus leucodermis*, but she said that sometimes it was just called it **naasik'** (see *Rubus idaeus*, above). Discussion with other collaborators confirms that many people did not distinguish between *Rubus idaeus* and *R. leucodermis* although both species were found on the traditional territory. One person said that black raspberry was a riper red raspberry.

Medicinal Use/Spiritual/Ceremonial Use

No information was reported for the use of **maaý̓im hagwiluxw** for spiritual, ceremonial or technological purposes by the Nisga'a or any other northwestern nation.

Technological Use

One collaborator recalled that "blackberries" were mixed with orange rock lichen (*Xanthoria* sp.) and clay to make a black dye for canoes. Based on the discussion above it seems likely he was referring to *Rubus leucodermis* (black raspberry) rather than "blackberries" (discussed below). The Nisga'a literature consulted supports the use of **maaý̓im hagwiluxw** (as *R. leucodermis***)** for dye (Emmons 1991, Boston et al. 1996).

K̲'o'o – thimbleberry – *Rubus parviflorus* Nutt. var. *parviflorus*

Rubus parviflorus is found from the lowlands to the subalpine on moist to mesic sites on Nisga'a traditional territory in open forests, along streambanks, in clearings and on roadsides in the lowland to subalpine zones. It is common throughout BC, south of approximately 56^{o}N.

Food Use

Eleven collaborators recalled that **k̲'o'o** berries were only eaten fresh on a casual basis and that they were never stored because they were too fragile. One person recalled that they were called belly button berries and another said "they disappear into nothing" once you pick them. Seven people recalled that the newly emerging sprouts called **ulx** or **goo'hlk** were picked, peeled and eaten in the spring. Other northwest peoples used this species in a similar way (McNeary 1974; Pojar and MacKinnon 1994; MacKay et al. 2001; Moerman 2002; Turner 2004a; Turner 2005).

Medicinal Use

Digestive Disorders: As with all berries, **k̲'o'o** were eaten alone or mixed with other berries at the end of a meal to help digestion.

Tonic: One collaborator recalled that the roots of **k̲'o'o** were dug out and boiled. The, resulting liquid was taken as a drink for energy.

Nations to the south used the leaves, roots, stems and berries of *Rubus parviflorus* for a variety of medicinal purposes (Turner 1990; see Moerman 2002, 2009).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **k̲'o'o** for spiritual or ceremonial purposes by the Nisga'a or any northwestern nation.

Technological Use

One collaborator recalled the large leaves of **k̲'o'o** were used to make a temporary drinking cup. In the Nisga'a literature, Sarah Barton recalled that the leaves were used to cover foods being cooked over a fire (Nisga'a Tribal Council 1995, Vol. IV., pg. 166) and the berry juice was used for making dye (Boston et al. 1996). These uses are comparable to those of other northwest peoples (Pojar and MacKinnon 1994; MacKinnon et al. 1999).

The Gitxsan used the leaves for "shingling the frames of berry racks;" the leaves were tied into a ball bound with willow twine and the leaves were folded, bitten and cut to make different designs (Smith et al. 1997).

Miigunt – five-leaf bramble – *Rubus pedatus* Sm.

Rubus pedatus is a shade-tolerant dwarf trailing shrub found on the forest floor of cool conifer forests throughout Nisga'a traditional territory and across British Columbia.

Food Use

Five collaborators recognized this species and said that the berries were gathered incidentally when encountered in the forest. One person said that they were really sweet and people enjoyed eating them and may have dried them. Only one collaborator recalled a Nisga'a name, **miigunt**, for this species – the same name she gave for *Fragaria virginana* (wild strawberry). The berries were also eaten casually by the Gitxsan, Haida, Tsimshian and other northwestern peoples (Compton 1993; Turner, 1995b, 1997, 2004a; Smith et al. 1997; MacKinnon et al. 1999; Turner and Thompson 2006).

Medicinal Use/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of **miigunt** for medicinal, spiritual/ceremonial or technological use by the Nisga'a or any other northwestern nation.

Miik'ookst – salmonberry – *Rubus spectabilis* Pursh

Rubus spectabilis can be found on Nisga'a traditional territory on moist to wet sites in forests, swamps and streambanks from low to middle elevations. It is more common near the coast.

Food Use

Fifteen collaboators said that these berries were harvested, eaten fresh and occasionally dried for winter use. One person from Gitlaxt'aamiks and one from Gitwinksihlkw said that the plants with big berries were found mostly on the coast, two people said that upriver people gathered them when they were working down in the fish canneries. People recalled that, like many kinds of berries, **miik'ookst** were mixed with other berries and grease and served at feasts. Two people said that **miik'ookst** were ripe when the spring salmon were running. One person said that **miik̲’ook̲st** were mixed with whipped **is (**soapberry) to sweeten it. Four people said that **miik̲’ook̲st** sprouts (**ulx**) were picked in the spring, peeled and eaten as one of the early spring greens (see also **k’o’o**, above). Nisga’a literature confirms the harvesting of **miik̲’ook̲st** berries and sprouts (McNeary 1974a, 1976). These uses are similar to those of other northwestern peoples (Kari 1985, 1995; Emmons 1991; Turner 1995b, 2004a; Smith et al. 1997).

Medicinal Use/Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga’a use of **miik̲’ook̲st** for medicinal or spiritual/ceremonial purposes.

In other areas of the Northwest, the Haida mashed the berries and mixed them with eulachon grease to make the hair glossy and used the thorns mixed with other ingredients for poultices (Newcombe 1897; Turner 2004a). They had several spiritual and ceremonial uses, as well as origin stories, that include salmonberry (Turner 2004a).

Technological Use

One collaborator recalled that the leaves of **miik̲’ook̲s**t were used to whip up soapberry. The leaves were also used by the Tlingit to make a reddish pink dye (Emmons 1991). In other areas of the Northwest, the large leaves of this species were used by some peoples to line baskets, wipe fish or cover food in steaming (Turner 2004a).

2.3.4.4. Flowering Herbaceous Plants

Herbaceous plants are those with a non-woody stem that die back at the end each growing season. They can be annual, perennial or biennial.

An annual herbaceous plant completes a whole life cycle in one year and disperses viable seed that may germinate and grow during the next growing season into a new plant. Some introduced annual species (e.g., *Chenopodium album* – lamb’s quarters, *Galeopsis tetrahit* – hemp-nettle[36] and *Capsella bursa-pastoris* – shepherd’s purse) are found on Nisga’a traditional territory are considered weeds or “nuisance species.”

Biennial herbaceous species are those which take two years to complete their life

[36] Not to be confused with **sdatx** (stinging nettle, *Urtica dioica*), an herbaceous perennial that was used by the Nisga’a for food, medicine and technological purposes.

cycle. In the first year the plant grows leaves, stems, and roots (vegetative structures), then it enters a period of dormancy over the first fall and winter. During the next spring or summer, the stem of the biennial plant elongates and the plant produces flowers, fruits and seeds before it dies later in the second year (e.g., tansy ragwort – *Senecio jacobaea* L.).

Perennial plants can grow for more than two years. They grow and bloom typically over the spring and summer and then die back every fall and winter. Under favourable conditions, shoots return in the spring from their root-stock but in addition they can produce new plants from the seeds or spores that are dispersed from a parent plant. All of the herbaceous species having confirmed uses as discussed with collaborators were perennials.

Water hemlock – (unknown Nisga'a name) – *Cicuta douglasii* (DC.) J.M. Coult. & Rose. Family: Apiaceae (Carrot family)

This extremely poisonous species is found on Nisga'a traditional territory growing in moist soils in or near marshes, swamps, bogs and ditches from low to middle elevations. All parts of the plant are poisonous but the roots and stem bases are the most dangerous. This plant looks similar to some other plants growing in the Nass, and was identified growing side by side with the related *Heracleum lanatum* and *Sium suave* that are not poisonous. Because these species look similar, care must be taken to correctly identify species before handling or ingesting them or using them for medicinal purposes.

Food Use/Medicinal Use/Spiritual/Ceremonial Use/Technological Use

Three collaborators recognized this plant and said that they were told to stay away from it. One person said that she could not see how it could be confused with the larger *Heracleum lanatum* because she didn't think they looked alike at all. No information was reported or recorded for the Nisga'a use of this species.

Smith (1929) noted that the Bella Coola people used the roots as a purgative. However, this is extremely unlikely since the roots are considered to be so poisonous. It is possible that *Cicuta douglasii* (Douglas water hemlock) was confused with *Sium suave* Walter (water parsnip) or *Oenanthe sarmentosa* C. Presl ex DC (water parsley). The difference between theses species can be seen in the stem base. The poisonous stems of water hemlock when cut lengthwise reveal chambers but the chambers are not present in water parsnip or water parsley (Turner 1995b). The Nlaka'pamux (Thompson) peoples, recognizing its toxicity, used the roots cautiously to make a poultice applied for a short period of time on aching backs and legs (Turner et al. 1990). Pojar and MacKinnon (1994, pg. 215, based on Turner et al. 1990, 1994) note that "... Nlaka’pamux elders say the only antidote to this poisonous plant is drinking salmon-head soup or salmon oil ...”

Haḿook, ho'ok – cow parsnip – *Heracleum maximum* Bartram (formerly *Hercleum lanatum* Michx.). Family: Apiaceae (Carrot family).

Nisga’a word meaning: The word is made up of **ha-** 'instrumental prefix' and **m'ook** 'to suck through a tube-like object' (a slightly different meaning from **t'ook**). This refers to the use of a piece of stem as a drinking straw (it is also the word for a shaman's sucking tube).

Heracleum maximum is found on Nisga’a traditional territory and throughout British Columbia in wet to moist areas (both open and lightly wooded) from the lowlands to the alpine.

Food Use

Thirteen collaborators recalled that the young stems of **haḿook** were harvested in the spring, peeled and eaten. One person said that the stems were mixed with grease and sugar and one said that sometimes they were cut up and eaten with eulachons. One person said the season for edibility only lasts a week and then they become too hard. She said that she tried to freeze them once but that they became mushy. One person cautioned that you have to know which plant to eat because if you eat the wrong one, you can turn black all over (see *Cicuta douglasii* above). One person gave two different names and uses for this food. He said that “... **ho’ok** is picked early [when about 15-20 cm], is round ... and you take the bottom and eat it, and **haḿook** you slice in half, remove the inside [the pith] for food, [and] mix it with soapberry to eat it” (Sim’oogit Gadim Galdoo’o – Charles Alexander 2008). One possible explanation for the difference between these two foods is that **ho’ok** is the budstalk of the cow parsnip (harvested before the bud swells) that is peeled and then eaten, while **haḿoo<u>k</u>** is the leafstalk, split down one side and the inner bark scraped off (Turner pers. comm. 2011). Mercy Azak said that some areas have bitter tasting plants while other areas produce sweet-tasting stems (McNeary 1974a). The young stems (picked before flowering) were peeled, eaten raw and sometimes served with eulachon grease and sugar (McNeary 1974a; Boston et al. 1996).

All northwestern nations used the early stalks and leafstems as one of the first spring vegetables (Emmons 1991; Pojar and MacKinnon 1994; Turner 1995b; Smith et al. 1997).

Medicinal Use

Digestive Disorders: One collaborator recalled that the peeled stems of **haḿoo<u>k</u>** can be consumed to help ease stomach and digestive problems.

Miscellaneous: Sigidimna<u>k</u>' Ẃii Ts'iksna'a<u>k</u>s (Pauline Grandison) recalled that her grandmother took the roots of **haḿoo<u>k</u>** and soaked them in hot water and used them for her hair, but she wasn't sure if this was for medicine or to make her hair shiny (2008). Other nations use the roots of **haḿoo<u>k</u>** for hair ointment, dermatological aids and other medicinal purposes, so it is possible that Pauline's grandmother likewise used them for grooming as well as medicinal purposes (Smith 1929; Turner and Bell 1973; Gottesfeld and Anderson 1988).

Skin Disorders: One collaborator recalled that the stems of **haḿoo<u>k</u>** can be peeled and rubbed on cuts to help them heal. Cow parsnip contains chemical compounds called furanocoumarins that can cause skin damage, especially to people who are light sensitive, so its historical use for treating skin disorders was likely carefully monitored (Steck 1970; Camm et al. 1976; Kuhnlein and Turner 1987; 1996).

Other nations in the southwest of British Columbia and throughout North American used various parts of this plant for various medicinal purposes (see Moerman 2002; 2009).

Spiritual/Ceremonial Use

No information was reported for a Nisga'a use of **haḿoo<u>k</u>** for spiritual or ceremonial purposes. Nisga'a literature records that roots of **haḿoo<u>k</u>** were used for ointment to annoint the head and body of post-menstrual girls leaving their seclusion cave (Nisga'a

Tribal Council 1995, Vol. IV, pg. 67).

Technological Use

Six collaborators recalled that when the stems of **haḿoo<u>k</u>** were more mature, the dried hollow stalks were made into whistles. Three people said that they used to make these whistles when they were kids and used them when playing in a children's "marching band." One collaborator said that the dried hollow stems were made into peace pipes. This species (and others of the same genus) contain phototoxic compounds which can make the skin sensitive to sunlight, so they must be handled carefully. The stems of **haḿoo<u>k</u>**, if used too fresh for whistles or pipes, can cause blistering of the mouth (Turner 1995b, 2001).

Hiina<u>k</u> – skunk cabbage – *Lysichiton americanus* Hulten & H. St. John

Family: Araceae (Arum family)

Lysichiton americanus is found on Nisga'a traditional territory in swamps, wet ditches and moist forests at low to middle elevations.

Food Use

> *This one, when it turns yellow* [pointing to the spathe (bract) and spadix (flowers)] ... *you know that you check on it all the time in the fall and you see the moose have eaten it, then you know it's ready. Then, you take it and you dry it up and they look like banana chips ... that's how they look and that's what they used to mix with any kind of medicine you want to mix it with to make it stronger and to help you with your sickness, to cure it. And it's good just to eat it like banana chips* (Sigidimna<u>k</u>' Alisgum <u>X</u>sgaak – Diane Smith 2008).

There were no other recollections or record for the food use of **hiina<u>k</u>**. Generally **hiina<u>k</u>** was considered a food for animals.

Occasionally the roots were boiled, roasted or steamed for a lengthy period and were eaten sparingly as an emergency or famine food by some people (Kuhnlein and Turner 1996). Eating the leaves can be harmful because they contain crystals of calcium oxalate that can irritate the throat and cause swelling and close the throat (Turner and Szczawinski 1991; Turner 1995b). In the southern part of the province and in Washington people used the leaves (as *Lysichiton camtschatcense*) when roasting camas (*Camassia quamash* (Pursh) Greene) to add flavour (Turner 1995b; Moerman 2002).

Medicinal Use

Arthritis/Rheumatism: One collaborator recalled "... that the **hiina<u>k</u>** roots and all were mashed and mixed with water used to make a rub ..." (Sigidimna<u>k</u>' Ẃiit'a<u>x</u> An'un – Belinda Robinson 2008).

Unspecified Illness: One collaborator said that the flowers and bracts of **hiina<u>k</u>** were mixed with other medicines (see above) to make it stronger and to help cure illness. Another person recalled that "... the leaves were layered over a fire covered with hot rocks and a layer of earth; then you sit in front of the fire and breathe in the steam to take sickness out of your body ..." (Sim'oogit Ksdiyaawa<u>k</u> – George Williams 2008).

The Gitxsan had similar medicinal uses for skunk cabbage (referred to as *Lysichiton kamtschatcense* Schott and **s<u>k</u>an ts'iks** by Smith 1929). **S<u>k</u>an ts'iks** is the Nisga'a name for *Veratrum viride* (false hellebore) and the Gitxsan name for the leaves of false hellebore (Smith et al. 1997). Because Smith (1929) noted the name for skunk cabbage as **s<u>k</u>an ts'iks**, Smith et al. (1997) concluded that Smith (1929) had meant false hellebore when he described the uses attributed to skunk cabbage. As the Nisga'a collaborators were positive about their identification and the use of **hiina<u>k</u>** for the medicinal purposes noted above, it is possible that Smith (1929), in fact, had correctly identified the species, but mistakenly called it by the Gitxsan name for false hellebore.

The Tlingit used the roots of this species as a poultice and also boiled dried roots and bark in water for unspecified conditions. However, Emmons (1991) used the Tlingit name for devil's club when describing the uses for skunk cabbage. The editor of Emmons' work concluded that Emmons had just used the wrong Tlingit name for skunk cabbage (Laguna *in* Emmons 1991 pg. 363).

Spiritual/Ceremonial Use

No information was reported for a Nisga'a use of **hiina<u>k</u>** for spiritual or ceremonial use.

Technological Use

Ten collaborators recalled that the leaves of **hiinak** were used to wrap and store food. **Gal'ink** (bentwood boxes) were lined with the leaves to stop mould and keep food fresh. One collaborator said it was "like wax paper to the Nisga'a" and that the large vein was skimmed off the leaf then it was passed over the fire to soften it before wrapping food and storing the food in **gal'ink**. Two people said they were used to make **gink** ("stink eggs"); the eggs of salmon roe were put in a hole in the ground and covered with leaves of **hiinak** and allowed to age (and presumably ferment) for about a month. Three people said **hiinak** leaves were used to dry berries in the sun and then the berries were wrapped in the leaves and stored in boxes lined with **hiinak**. One person said that the big leaves were used to catch soapberries and other berries that were shaken off the bush and one person said the leaves were laid on the ground to use like table cloths. Two peoples said that the leaves were made into temporary cups for drinking water when out on the land (Figure 2.4). Perhaps the most unique use was described by Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2009) who said that that the yellow flowers were used in the original paintball game where they were thrown at opponents and splattered all over them.

Figure 2.4. Temporary drinking cup made from **hiinak** leaf.

Sigidimnak' Sayt Gibuu (Mildred Stephens) noted that berries were dried on **hiinak** leaves. Sigidimnak' Lootkw (Beatrice Bright) said that meat was laid out on the leaves at feasts, and Sigidimnak' Hlgu K'alams (Sarah Barton) said leaves were used to cover food being cooked over a fire (Nisga'a Tribal Council 1995, Vol. IV, pg. 167).

The Tsimshian, Haida, and many other nations to the south used the leaves of skunk cabbage for storing and preserving food (Compton 1993; Moerman 2002; Turner 2004a)**.**

Common burdock – (unknown Nisga'a name) – *Arctium minus* L.

Family: Asteraceae (Aster family)

Arctium minus is a species introduced from Eurasia, now found on Nisga'a traditional territory on dry roadsides and other disturbed area from low to middle elevations. It is common throughout coastal British Columbia and much of the Interior as well.

Food Use/Medicinal Use/Spiritual/Ceremonial Use/Technological Use

One collaborator recalled:

> *... they [the ancestors] have a name for that in our language and they don't like those kind of burrs. They used to take them out early in the spring when the ground is wet, it's really easy to pull them out, so they do that*. (Sim'oogit Ni'isjoohl – Horace Stevens 2007)

Five people recalled that *Arctium minus* was found on Nisga'a traditional territory but said that the Nisga'a never developed any uses for it. One person said it had a Nisga'a name but could not remember it[37]. Another person recalled that the Japanese call it "**gobo**" and apparently used it in some ways (Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2011). Further research revealed that the roots, which look something like parsnip, are highly valued by the Japanese as a food and for their medicinal properties as well (Horne 2007).

No information was recorded for its use by the Nisga'a or any other northwestern nation in British Columbia. However, it is used by many people in other areas of North America for a variety of medicinal and culinary purposes (see Moerman 2002, 2009).

[37] *Galium* species and *Dryas drummondii* were called **kuukw'alee (**"sticking to the tail;" Jose Coosmans pers. comm. May 2011) One collaborator suggested this would seem seem a plausible name for burdock as well, given the adhesive properties of its dry burred fruits.

Wild mint – (unknown Nisga'a name; skan isxwit in Western Gitxsan) – *Mentha arvensis* L. Family: Lamiaceae (Mint family)

Word Meaning: "**isxw**" in Gitxsan means 'to stink,' equivalent to the Nisga'a word "**iskw**" –'to stink.'

Mentha arvensis is a cirumboreal species found on Nisga'a traditional territory in marshes, meadows, and along streamsides and riverbanks at low to middle elevations.

Food Use

Four collaborators recalled that the leaves of wild mint were brewed to make tea for enjoyment. One person recalled that it used to grow outside her Granny's place near a creek in Gitlaxt'aamiks, and that it smelled nice.

Medicinal Use

Arthritis/Rheumatism: One collaborator said that a mixture of mint leaf, **wa'ums** (devil's club), cloves, and **tiim laxlax'u** (Labrador tea) was simmered together to make a tea for arthritis.

Miscellaneous: One collaborator recalled that the ground leaves of mint were mixed with **wa'ums** to take away the bitterness of the devil's club medicine.

Unknown: One collaborator said that mint was used in the past for medicine.

Further south, the Nuxalk (Bella Coola) boiled the entire mint plant (syn. *Mentha canadensis* L.) and drank the decoction for stomach pains, where there was no vomiting, constipation or diarrhoea present. Similarly, the Ulkatcho (Southern Carrier) boiled the whole plant and drank the decoction for stomach problems and colds, lung problems and various other illnesses as well (Smith 1929). Mint was widely used for medicinal purposes across North America by other First Nations (Turner 1995b, 1997; Moerman 2002, 2009).

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the spiritual/ceremonial or technological use of wild mint by the Nisga'a or other northwestern nations.

Ts'anksa gaak – nodding onion – *Allium cernuum* Roth var. *cernuum*

Family: Liliaceae (Lily family)

Nisga'a word meaning: Translates to 'armpit of raven' (**ts'anks** 'armpit') due to the smell.

This species is more common in southern BC, south of 56^{o}N. There are populations north of 56^{o} on dry to mesic rocky bluff and grassy slopes from low to subalpine elevations, but more commonly at low elevations.

Food Use

One collaborator recalled using **ts'anksa gaak** as a "flavouring for food, with a strong onion taste" and that it "... was different from the plant found in Kitselas Canyon, which tastes like garlic." (Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2009). Hagwilook'am saxwhl giis transplanted plants from Kitselas into her home garden in Gitwinksihlkw. The Gitxsan were noted to use the wild onion for flavouring when cooking rabbit (Smith et al. 1997).

Medicinal Use/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of **ts'anksa gaak** for medicinal/spiritual/ceremonial or technological purposes by the Nisga'a or any other northwestern nation.

Gasgam ts'im ts'eets'iks – northern riceroot – *Fritillaria camschatcensis* (L.) Ker Gawl.

Family: Liliaceae (Lily family)

Nisga'a word meaning: This means literally 'rice' **(gask)** of or in 'ground.' **Gask** originally referred to the bulblets, which are edible but bitter (the original meaning of **gask** is 'bitter'). The words 'in ground' were added for this plant after Asian rice (*Oryza sativa* L.) was imported and **gask** became used for rice, which became a staple food. *Fritillaria camschatcensis* can be found on Nisga'a traditional territory on moist sites at low to subalpine elevations. It is more common on the coast on grassy moist sites but is also found inland in the right habitat from low to subalpine elevations. One collaborator recalled that:

> *I used to go out with my uncle in Old Aiyansh to get it, growing around the water, but … you can't find it growing at the landing now because there is too much gravel around* (Sigidimna<u>k</u>' Ẃii Ts'iksna'a<u>k</u>s – Pauline Grandison 2008).

Food Use

Twelve collaborators recalled that the roots of this plant were harvested in the spring and were cooked and eaten like rice. Four people said that it could be bitter if it was harvested too late. Ten people recalled that **gasgam ts'im ts'eets'iks** was washed and cooked before eating and two people thought it was eaten raw, after washing. Two people said cooked **gasgam ts'im ts'eets'iks** was eaten with **ksuuẃ** (cambium of *Tsuga heterophylla* – hemlock) and one said that she put it up in jars for later use. Nisga'a literature reports that it was eaten with grease and sugar (McNeary 1975; Nisga'a Tribal Council 1995, Vol. IV, pgs. 161, 195, 196; Boston et al. 1996).

Medicinal Use/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisga'a use of **gasgam ts'im ts'eets'iks** for medicinal/spiritual/ceremonial or technological purposes.

The Tlingit, Tahltan, Haida, Gitxsan and Tsimshian all harvested the roots for food and prepared it in a similar manner (Albright 1982; Smith et al. 1997; Turner 2004a; Downs 2006) and the Haida also used it for medicine (Turner 2004a).

K'aa<u>x</u>aayst – false lily-of-the-valley – *Maianthemum dilatatum* (Alph. Wood) A. Nelson & J.F. Macbr. Family: Liliaceae (Lily Family)

Nisga'a word meaning: This word is a borrowing from Haida which has "**sk'aa<u>x</u>aay**", which was probably borrowed into Coast Tsimshian and from then into Nisga'a. The "**<u>x</u>aay**" part occurs in other Haida plant names, but the initial part does not have a separate meaning (Jordan Lachler, pers. comm. to Marie-Lucie Tarpent 2011). It is not clear why the Nisga'a word ends in **-st** unless by analogy with a few other plant names (e.g., **haast, sginist**).

Maianthemum dilatatum can be found on Nisga'a traditional territory at low to middle elevations on the coast and in the interior. It grows on mesic to wet sites in shady forests, on floodplains and on streambanks (E-Flora BC; Pojar and MacKinnon 1995).

The identification of **k'aax̲aayst** has been in question for some time (Nisga'a Tribal Council 1995, Vol. I, pg. 89). During the course of this research, five collaborators recognized *Mainthemum dilatatum* and said that it grew in the forests on Nisga'a traditional territory, but four of them could not recall a Nisga'a name. However, Sigidimnak̲' Ẃii Ts'iksna'ak̲s (Pauline Grandison) identified it as **k'aax̲aayst**. On three other occasions when shown a sample, she confirmed the species as **k'aax̲aayst**.

The Tsimshian use a similar word "**k'axaays**" as well as "**nagag̲anaw**" (frog's dress) for *Maianthemum dilatatum* as well as the exotic *Plantago major L*. – common plantain (Turner and Thompson 2006, Sm'algyax Talking Dictionary http://web.unbc.ca/~smalgyax/ viewed May 19th 2011). They use both species for medicinal purposes.

Food Use

Two collaborators thought that **k'aax̲aayst** berries were eaten incidentally, but were not harvested or stored. In the Nisga'a literature consulted, no further information was recorded on a Nisga'a food use of **k'aax̲aayst.** The Tsimshian and the Haida also ate the berries of this species (raw or steamed) on a casual basis (Norton 1981; Compton 1993), and they ate the young, new, unfolding leaves as a vegetable (Norton 1981).

Medicinal Use

Eye Disorders: One collaborator recalled that:

> *My grandmother used to use the roots* [of **k'aax̲aayst**] *for her eyes, when they were dry or sore, maybe runny. She washed the whole root, washed and soaked in water, then used for eye drops...* (Sigidimnak̲' Wii Ts'iksna'ak̲s – Pauline Grandison 2008).

Nisga'a literature notes that "... very early in our history, when our forefathers were put in the valley ... a medicine was made from **kaak'hise** (Nisga'a Tribal Council 1995, Vol. I, pg. 89). The medicinal preparation is described as follows:

> *Starting from the very tip of the tree, they took off the very tip of the* ***simg̲an*** [western redcedar]. *These were pounded together until it became a powder. When this procedure was complete, certain types*

> *of other leaves* [**k'aaxaayst**] *were picked to blend in with the already powdered redcedar fronds* ... (Nisga’a Tribal Council 1995, Vol. 1, pg. 89).

The medicinal salve made in this way was used to treat open wounds and infections. It is also noted that:

> *... much later when the spruce started to grow, many many years later, ... the pitch seen on the outer bark was ...blended with the cedar bough fronds and “kaak’hise”*[**k'aaxaayst]**. *At a much later date, the roe of sockeye salmon was added as an ingredient to the blend to stop it from congealing.* (Nisga’a Tribal Council 1995, Vol. I, pg. 89-90).

In other areas of the Northwest, the Tlingit wetted and heated the leaves and put them over the eyes to soothe sore eyes (Emmons 1991). Other northwestern peoples used the leaves as a “poultice for wounds, burns and skin infections” (Turner 2004a). In southern BC, *Maianthemum dilatatum* was also used for burns, wounds and other medical conditions by the Hesquiat, Nitinaht and Oweekeno (Turner and Efrat 1982; Turner et al. 1983; Compton 1993) while the Quinault nation in Western Washington state used the roots to treat eye conditions (see Moerman 2002, 2009).

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of **k'aaxaayst** for spiritual, ceremonial or technological purposes by the Nisga’a or any northwestern nation.

K’ots – false Solomon’s seal **–** *Maianthemum racemosum* subsp. *amplexicaule* (Nutt.) LaFrankie; (syn. *Smilacina racemosa* (L.) Desf.). Family: Liliaceae (Lily family)

Maianthemum racemosum is found scattered on Nisga’a traditional territory in moist forests, and along streambanks and riverbanks at low to sublalpine elevations.

Food Use

Five collaborators recalled that the berries of **k’ots** were harvested when you could find them and one person remarked you had to get them before the birds did. Two people recalled that the berries were sweet; one person that you could make wine from them and another said that they could be cooked lightly and eaten with sugar and grease. One person said that the berries were called **maaý smax** and commented that "**…**those are for the bears…we don't eat that. It's not good for your stomach, but the bears have a powerful stomach and they eat that…" Nisga'a literature notes that the berries were stored with grease (Nisga'a Tribal Council 1995, Vol. IV, pg. 188).

Medicinal Use

> *The whole plant* [**k'ots**] *was used for medicine, right down to the roots, but it is not used any longer. It was prepared like Indian tea, that is by boiling the plant parts. It was used to purify your body. ... During the smallpox epidemic, it was felt that the dead bodies should have been washed with the juice of the plants to prevent the disease from spreading* (Sigidimnak' Alisgum Xsgaak – Diane Smith 2008).

Miscellaneous: One collaborator recalled that the dried roots were steeped in water and taken as a pain killer.

Skin Disorders: One collaborator recalled that the roots of **k'ots** were mashed and mixed with grease and applied externally to cuts and wounds.

In other areas of the Northwest, the Tlingit dug the roots of *Maianthemum racemosum* (syn. *Smilacina racemosa*) in the spring, rubbed them on a stone, then steeped them in hot water that was taken as a purgative (Emmons 1991, pg. 363). The Gitxsan boiled the roots in water to make a strong decoction for rheumatism, back pain and kidney trouble. They also mashed the roots and bound them on cuts (Smith 1929; Smith et al. 1997). In the southern part of the province this species was more widely used for a variety of medicinal uses by the Secwepemc (Shuswap), Nlaka'pamux (Thompson), South Tsimshian and Okanagan-Colville peoples (Palmer 1975; Turner et al. 1980, Turner et al 1990; Compton 1993; Moerman 2002, 2009).

Spiritual/Ceremonial Use

Two collaborators said that the whole plant was thrown in a creek to keep the creek free of the ghosts of people thrown into the creek after they died from smallpox. Another person said the flowers were taken into the house because they look good and smell nice.

Technological Use

No other information was reported or recorded for the use of **k'ots** for technological purposes by the Nisga'a or any northwestern nation.

Maaý a smax – twisted stalk **–** *Streptopus amplexifolius* (L.) DC.

Family: Liliaceae (Lily Family)

Nisga'a word meaning: This means literally 'berries of the bear,' suggesting that people did not eat them.

Streptopus amplexifolius is found on Nisga'a traditional territory in moist forests and among riparian (streamside) vegetation at low to subalpine elevations.

Food Use

No information was reported for a Nisga'a use of this species as a food consumed by people. Three collaborators did recognize the plant but only one recalled the name **maaý a smax** and said that it was considered food for bears, hence the name which translates to "bear berries."

In other areas of the Northwest, the Dena'ina (Tanaiana), Tanana and the Tlingit ate the berries of *Streptopus amplexifolius* as a fruit and the young tender shoots as a vegetable (Heller 1953; Kari 1985, 1995).

Medicinal Use

Abdominal Disorders: One collaborator recalled that **maaý a smax** can be used as a laxative but that you can get diarrhea if you eat too many berries.

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of **maaý a smax** for spiritual, ceremonial or technological purposes by the Nisga'a or any northwestern nation. In the Southern Interior, the Nlaka'pamux (Thompson) people tied the sweet-smelling plant to their clothes or hair for its sweet fragrance (Steedman 1930).

Ts'iks – false hellebore – *Veratrum viride* Aiton. Family: Liliaceae (Lily family)

Nisga'a word meaning: This is an adaptation from Tlingit '**s'iksh'** but the meaning is unknown (Crippen pers. comm. 2012).

Veratrum viride is found throughout Nisga'a traditional territory on moist to wet meadows, along streambanks, swamps and in open forests and meadows from low to alpine elevations, especially in the subalpine zone. This plant is known to be highly poisonous due to the presence of several poisonous alkaloids[38]; the roots, rhizome, and young shoots are considered most toxic (Canada Poison Plants Information System 2009). Despite its poisonous nature, it continues to be widely used by many First Nations.

Of the fourteen collaborators who recognized *Veratrum viride* and recalled the Nisga'a name **ts'iks,** eight of them remarked that it was poisonous and had to be treated with great respect and used with extreme caution. On occasion this species was confused with large specimens of *Smilacina racemosa* (**<u>k</u>'ots**) by some collaborators. Both species have broad elliptical leaves with strong parallel veins, clasping at the base. However the leaves of **ts'iks** grow in a whorl around the stem, whereas the leaves of **<u>k</u>'ots** (*Smilacina racemosa*) alternate along the stem in two rows.

Food Use

No information was reported or recorded for a Nisga'a use of **ts'iks** for food. The Blackfoot are reported to have added the young leaves of 'bitter taste' or 'blue leaves' to soup and to give the leaves to children to stop their drooling (Hellson and Gadd 1974, pg. 105). Given the poisonous nature of false hellebore this might be an example of a case where *Smilacina racemosa* and *Veratrum viride* use are confused. Such use is not recommended for *Veratrum viride* (Hellson 1974, pg. 105).

Medicinal Use

Nisga'a literature records the following about the use of **ts'iks** for medicinal purposes (Nisga'a Tribal Council 1995, Vol IV, pg. 88):

> *... the part that is soaked for medicine is the roots. The way it is used is as a rubbing liquid. You rub **ts'iks** all over your body and it protects or immunizes you from getting injured; or it neutralizes any other medicine which might be used on you by someone else, like*

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[38] Alkaloids are one of a large group of nitrogen-containing organic compounds found naturally in plants. Alkaloids and alkaloid-producing plants are especially well known for their toxic and sometimes euphoric and hallucinogenic properties. They are usually very bitter and although some plants with alkaloids may be considered poisonous, they may have extracts that are pharmacologically active (Wink 1998, and http://www.biology-online.org/dictionary/Alkaloid. Accessed on: Aug. 2010).

your enemies for instance. This medicine has been used by the Nisga'a since time immemorial, especially during the war-times.
(Sim'oogit Ginwax – Abraham Davis)

Anaesthetic: One person said that her grandmother used **ts'iks** roots like an anaesthetic, to numb areas of the body, and one person said the roots were applied topically in a salve to ease pain. Two people said that the roots of **ts'iks** were used to make a powerful topical salve. Literature records that the Nisga'a used small quantities of the roots to treat toothaches (Pojar and MacKinnon 1994, pg. 113).

Arthritis/Rheumatism: One person said that the grated dried roots were used in medicinal preparation for sore hips and might have been used in **mihlxkws** for treating arthritis (see **ambokkw –** *Populus tremuloides* and **seeks –** *Picea sitchensis*) for an explanation of the **mihlxkws** process**).**

Chest Infections/Colds/Bronchitis/Tuberculosis: One person recalled that her dad used the roots of **ts'iks** to treat coughs by inhaling the vapours as it was simmering in a pot. Another person recalled that a very, very small piece of root was chewed for sore throats and that the juice was swallowed but not the root itself. Both of these people emphasized emphatically that the roots were never eaten because it could paralyze or kill you. A relative of one of the collaborators ate a small piece of root and was temporarily paralyzed.

Skin Disorders: One collaborator recalled that flowers and/or seeds were mixed with "balsam sap" (resin from fir – *Abies* trees) and eulachon grease and applied externally to the skin to treat infections. Another person recalled that the roots were mashed and mixed with pitch from an unidentified conifer (perhaps spruce or pine) for use as a topical salve. Both people emphasized that it must be used with caution and never swallowed, as it can cause paralysis or death.

Another collaborator who called **ts'iks** a "powerful medicine" said that people used to grind the roots and mix it with water, then sit in a tub of water to relieve itching, and that this solution was good for pimples.

Miscellaneous: Five collaborators recalled that the ground dried roots of **ts'iks** were put in a small bag and immersed in the bath water to help you relax; one person remarked that it was valued for its particular smell, once it had dried out. Another person said that the seeds could also be dried, ground and put in a bath to promote relaxation.

False hellebore was used for medicinal purposes throughout the Northwest by the Tlingit, Dena'ina (Tanaina), Haida, Gitxsan and Tsimshian nations (Smith 1929; Emmons 1991; Kari 1995; Smith et al. 1997; Turner 2004a; Turner and Thompson 2006) as well as in the southern part of the province (see Moerman 2002 and 2009 for more detail). Dr. C.F. Newcombe recounted to Harlan Smith (1929, pg. 12) that "... this plant seems to be used by every tribe in whose territory it grows." All peoples recognized the poisonous nature of the plant and had similar cautions around its use.

Despite the caution against using it internally, a few nations were noted to use the roots in solution very sparingly as a drink, but always with the warning that it was extremely poisonous and must be administered with care (Smith 1929; Emmons 1991). The Tlingit, who called this species **s'iksh**, said that it "gave deep sleep like an intoxicant ... [and] ... regarded it as a sovereign remedy though dangerous" (Emmons 1991, pg. 363). The Southern Carrier peoples "... dried the roots in the sun and powdered them by rubbing them on a stone and took about a dessert spoonful of the powder taken in hot water as an emetic for sickness..." [with a warning that] "...Too strong a decoction [is] considered fatal" (Smith 1929, pg. 12).

In the mid-twentieth century, extracts from *Veratrum viride* were used to treat cases of hypertension but it has not been used recently because it is considered unreliable (Turner pers. comm. 2012). It has also been used as an insecticide (Canadian Poisonous Plants Information Centre 2009).

Spiritual/Ceremonial Purposes

> *The roots* [of **ts'iks**] *were prepared with **wa'ums** (devil's club) for **sisatkw*** [purification or cleansing ritual before going hunting] ... *it brings good luck ... the seeds were used for necklaces too, to bring good luck.* (Sim'oogit Gadim G̲aldoo'o – Charles Alexander 2008).

Six collaborators recalled the use of **ts'iks** to drive out bad spirits or bring good luck to a home. One collaborator said:

> *You use the roots for smudgin. Wwhen you have bad omens in your home you smudge it out, you use* ***wa'ums*** *with it, you do it from corner to corner for four days* (Sigidimnak̲' K'igapks – Alice Azak).

One person said that some people used to grind up the seeds and use them in the bath or for luck.

Technological Use.

No information was reported or recorded for the use of **ts'iks** for technological purposes by the Nisga'a or any northwestern nation.

G̲ahldaats' or **majagaleem ganaaw̓ –** yellow pond-lily – *Nuphar polysepala* Engelm

Family: Nymphaeaceae (Water-lily family)

Nisga'a word meaning: majagaleem ganaaw̓ literally means 'flower-of frog.' The etymology for **gahldaats'** was not retrieved in this research.

Nuphar polysepala is an aquatic species found on Nisga'a traditional territory in ponds, swamps and marshes at low to middle elevations (Pojar and MacKinnon 1994; MacKinnon et al. 1999).

Food Use

One collaborator thought that, just before they start to deteriorate, the flowers of **gahldaats'** were used to make tea but he wasn't sure if this was for medicinal purposes or just as a refreshing drink. In other areas of the Northwest, Heller (1953) noted that the Alaskan people boiled or roasted the rhizomes for food.

Medicinal Use

Arthritis/Rheumatism: Two collaborators recalled that **gahldaats'** was used to treat arthritis. One person said: "... the roots [rhizomes] were dried then mixed with stinging nettle roots and used for sore spots [arthritis] …" (Simon Calder 2008). He had personally had this treatment for arthritis and said it helped him a lot. Calder (2008) also said that the dried roots could be mixed with **wa'ums** and taken as a tea to treat arthritis. Another person said that the dried roots could be mixed with **wa'ums** (devil's club) or **ts'iks** (false hellebore) for treating arthritis but she couldn't recall if this was applied as a poultice or taken internally as a drink. Given the poisonous nature of **ts'iks**, it likely refers to use as an external poultice. The Tsimshian also used the roots to treat arthritis (Turner and Thompson 2006).

Chest Infections/Colds/Tuberculosis: "a tea was made of the flower and dried roots ground together and taken for coughs" (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

Unspecified: Three collaborators said that the roots were used for medicine; one said that the roots of **gahldaats'** were part of a concoction of **wa'ums (***Oplopanax horridus*) and **ho'oks** (*Abies amabilis* or *A. lasiocarpa*).

The Gitxsan, who also call this species **gahldaats'**, immersed root scrapings in water and drank it to treat lung haemorrhages; it was also used as a male contraceptive, but no preparation information was given (Smith 1929; Johnson 1997; Smith et al. 1997; Johnson 2006). The Tsimshian ground up the roots to treat burns (in a poultice), but said that it could burn your skin if left in place too long (Turner and Thompson 2006). The Tanana[39] prepared a poultice of warmed sliced rhizomes as pain analgesic (Kari 1985). Many southern nations had a variety of medicinal uses for this species (Moerman 2002, 2009). Elsewhere, the bitter roots are dried and sliced and taken to treat ulcers (Turner et al. 1990).

Spiritual/Ceremonal Use/Technological Use

No information was reported or recorded for the use of **gahldaats'** for spiritual or technological purposes by the Nisga'a or any northwestern nation.

Haas (t) – fireweed - *Epilobium angustifolium* L.

Family: Onagraceae (Evening Primrose Family)

Nisga'a word meaning: the complete word is **haast** but a final '**t**' after an '**s**' is often omitted, as in English (e.g., pronouncing "past" as "pass" when speaking fast).

Epilobium angustifolium is found throughout Nisga'a traditional territory on mesic sites in open forest, meadows, roadsides, burns and other clearings at low to middle elevations.

[39] There is a coincidental similarity in the names Tanana (from Tanana River) and the name that has been used for the Tanaina of Cook Inlet, which is the anglicization of Dena'ina, 'the people.' Tanana and Tanaina are two separate Athabascan languages (James Kari pers. comm. 2011).

Food Use

Fifteen collaborators said that the stems of **haas** were picked early in the spring, slit with a fingernail or knife, and the sweet pith eaten as a treat. One person specified that the stems were only good to eat for about two weeks and then they became too hard to use in this way. One person recalled that her grandfather had a special wooden scraper for taking out the pith and that she still has the scraper. One person said that before sugar was introduced the pith of **haas** was used like sugar and that you could dry it and save it for later use. Another recalled that the stems were eaten with sugar. Eleven people said that the pith was mixed with red or green **is** (soapberry) when whipping it to both thicken and sweeten the whip. One person recalled that her grandmother used to hang out the scraped stems to dry and then fed them to horses and cows.

Gitxsan and Tsimshian peoples (who also called fireweed **haas**(**t**)) used the young stems in a similar way, as did the Haida,Wit'suwit'en and people from Alaska (Heller 1953; Norton 1981; Port Simpson Curriculum Committee 1983; Gottesfeld 1992a; Smith et al. 1997; Turner 2004a; Turner and Thompson 2006).

Medicinal Use

No information was reported or recorded for a Nisga'a use of **haas** for medicinal purposes. Elsewhere in the Northwest, some Dena'ina peoples used the raw stems externally to draw pus from boils or cuts and as an insect repellent (Kari 1985, 1995). The Haida peeled the stems and ate them as a tonic and laxative (Turner 2004a). The juice from fireweed was used by other North American First Nations to soothe skin irritation and burns, and a similar practice is also widely employed in European herbal medicine (Small and Catling 1999).

Spiritual/Ceremonial Use

No information was reported or recorded for the spiritual/ceremonial use of **haas** by the Nisga'a or any other northwestern nation.

Technological Use

Ancient stories tell of the use of fireweed pith[40] (**waahaast**) to make fibre for weaving

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[40] Some collaborators thought that it was the inside of the stems that were used for this purpose, but other ethnobotanical works record that the outer part of the stems were used for this purpose (Turner 2001,

dipnets (Nisga'a Tribal Council 1995, Vol. I, pg. 3). The same was recalled by Sigidimnak' Diiks (Dorothy Azak) (in Nisga'a Tribal Council 1995, Vol. IV, pg. 146).

Five collaborators also recalled that the inside of the hard stems were used to make string or twine and three of them said that long strands of women's hair were mixed in with the twine when making nets. Sim'oogit Ni'isjoohl (Horace Stevens) described the preparation of **waahaast** as follows:

> *The inner part of the stem* [just under the outermost skin] *was taken in thin strips and hung to dry...* [this] *makes a really strong twine for weaving nets...women would mix in long strands of their hair to increase its strength* [and] *the fat from seal was rubbed into twine to make it waterproof* (2007).

Sigidimnak' Ẃii Ts'iksna'aks (Pauline Grandison) recalled:

> *I went with grandmother in Old Aiyansh to pick them* [the stems] *when they were really hard. My grandmother took the outer skin off and laid them on a flat thing to dry in the sun; after they dried, she put them in strips and she used them for sewing* (2008).

The Gitxsan and Kitasoo also used the stem fibres for making twine (Compton 1993; Smith et al. 1997). The Blackfoot people rubbed the flowers on rawhide thongs or mittens to waterproof them in the winter and used the powdered inner stem on their hands and face to protect them from the cold (Hellson and Gadd 1974).

Common plantain – (unknown Nisga'a name; **tkwa'ltxw**[41] in Gitxsan) – *Plantago major* L. Family: Plantaginaceae (Plantain family)

Plantago major, introduced from Eurasia, is found on Nisga'a traditional territory on mesic to dry sites on lawns, fields, roadsides and other open disturbed areas from low to middle elevations.

Food Use

One collaborator said that she fed plantain to her rabbits when her children were little.

Turner pers. comm. 2011). Johnson (pers. comm. 2012) says it is the fibres between the cortex and vascular bundle that are used, and it is similar to the fibre in stinging nettles (pers. comm. 2012).

[41] Gitxsan word from People of 'Ksan (1980).

Medicinal Use

One collaborator recalled that her grandmother used to chew the leaves and put the mush on rashes; she tried it on one of her grandchildren but found that it didn't work for that particular rash.

Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for a Nisga'a use of plantain for spiritual, ceremonial or technological purposes.

In other areas of the Northwest, the Tsimshian and Gitxsan were noted to use plantain. The Tsimshian, called it **naaga̲naw** and/or **k'axaays** and used the leaves to soothe burns (Turner and Thompson 2006). The Gitxsan called it **tkwa'altxw** but no specific use was recalled. However, people felt that it must have been used in some way, since it had a name (People of 'Ksan 1980, pg. 96). It was also widely used for a variety of medicinal purposes throughout North America (see Moerman 2002, 2009).

Sorrel – (unknown Nisga'a name; **tl'ok̲'ats**[42] in Gitxsan – *Rumex* sp.

Family: Polygonaceae (Buckwheat family)

Word meaning: tl'ok̲'ats translates to 'sour weed' (Rigsby 1998). It is an adaptation of the Tlingit word '**tl'aaq'wátch'**, a word originally meaning a kind of dock or sorrel. The Tsimshian word is łak̲'oots obably comes from a different variety of Tlingit (James Crippen, pers. comm 2011).

Several species of *Rumex* and other members of the Polygonaceae family occur throughout the northwest from low to high elevations on disburbed ground and other open areas.

Food Use

No plant of this group was discussed with any collaborator, but Sim'oogit Ẃii Gadim X̲sgaak (Eli Gosnell) recalled that a sour grass-like plant was eaten by hunters in the mountains as a trail food (McNeary 1974, 1976). Other northwestern peoples were also

[42] This term is from an unpublished work "Plants - Gigeenix" obtained from but not authored by Dr. Bruce Rigsby (pers. comm.. Nov. 2010). Gigeenix simply identifies the words as coming from the "upriver" Gitxsan dialect group, as contrasted with the Geets "downriver" dialect.

noted to eat "sour grass" (Black 1955; Albright 1982; Emmons 1991; Pojar and MacKinnon 1994). The Haida called sour grass "**k̲ayluus**" which translates to sour (Turner 2004a). **Tl'ok̲'ats** is the Nisga'a word for domestic rhubarb (*Rheum rhabarbarum* L.) and may have been the Nisga'a word for a *Rumex* sp. or *Oxyria digyna*, or another member of Polygonaceae before rhubarb was introduced.

Medicinal Use/Spiritual/Ceremonial Use/Technological Use

No information was reported for the use sour grass for medicinal, spiritual, or technological purposes by the Nisga'a or any northwestern nation.

Ihlee'em ts'ak̲– red columbine – *Aquilegia formosa* Fisch. ex DC.

Family: Ranunculaceae (Buttercup family)

Nisga'a word meaning: this means literally 'blood' (**ihlee'e)** of the nose (**ts'ak̲)**, or 'bleeding nose' or 'nosebleed'.

This species, with its elegant bright flower, is found throughout Nisga'a traditional territory on mesic to moist meadows from low to subalpine elevations.

Food Use/Medicinal Use/Spiritual/Ceremonial Use/Technological Use

Ten collaborators recognized this plant and recalled the Nisga'a name. However, none could recall a specific use for it. Four people said that they would bring them in the house because they looked pretty and two had tried to transplant them into their gardens. Gitxsan children sucked on the nectaries of this species (Johnson pers. comm. 2012) but Haida children were actually told not to pick the flowers because this would make it rain (Turner 2004a). There was no additional information on the use of **ihlee'em ts'ak̲ (**red columbine) by the Nisga'a or any other any northwestern nation.

T'uuna'akw – common cattail – Typha latifolia L. Family: Typhaceae (Cattail family)

Nisga'a word meaning: This is a Salishan word (Nancy Turner pers. comm. 2011)

Typha latifolia is a semi-aquatic species found on Nisga'a traditional territory in bogs, marshes, ponds and wet ditches from low to middle elevations.

Food Use

Seven collaborators recalled that the roots of **t'uuna'akw** were dug in the early spring and eaten raw; five said they tasted like banana and were called Indian or Nisga'a banana in English. **T'uuna'akw** was one of the earliest spring foods; three people recalled that young roots were harvested at Fishery Bay, often in conjunction with eulachon fishing.

Medicinal Use

One collaborator examined the roots carefully and said that:

> *You use the roots for medicine, you burn it or else you ... you know, put it in water and then it dissolves and you use it for a rub ...*
> (Sigidimnak' Ẃiit'ax An'un – Belinda Robinson 2008).

No further information was recorded for the medicinal use of **t'uuna'akw** by the Nisga'a or any other northwestern nation. However, the roots of *Typha latifolia* were used by many other nations throughout North America for a variety of medicinal purposes, primarily as a rub for wounds, sores or other dermatological conditions (see Moerman 2002, 2009).

Spiritual/Ceremonial Use

No information was reported or recorded for the use of **t'uuna'akw** for spiritual or ceremonial purposes by the Nisga'a or any other northwestern nation.

Technological Use

Two collaborators recalled that the leaves of **t'uuna'akw** were used to weave baskets, hats, boxes and clothing. **Laya matx** (mountain goat wool) and **hat'al** (cedar strips) were often woven with **t'uuna'akw** leaves to make capes and dance regalia (Boston et al. 1996). The literature notes generally that the leaves and stems of *Typha latifolia* were woven into lightweight mats used for walls and roofs of temporary houses, insulation, mattresses, drying berries, preparing food; cattail fluff was used for stuffing pillows and mattresses, for diapers and wound dressing (Pojar and MacKinnon 1994; Turner 2001a).

Sdatx – stinging nettle – *Urtica dioica* L. Family: Urticaceae (Nettle family)

Urtica dioica is found on Nisga'a traditional territory on moist to mesic sites, especially those that are nutrient-rich. It grows along or near streams, on disturbed sites, along roadsides, in open forests and forest edges from low to subalpine elevations. Concentrations of stinging nettle are especially common around old village sites, farmyards, and other spots with a history of human use (Jim Pojar pers. comm. 2010).

Food Use

One person said that the leaves of **sdatx** could be used for tea. Two collaborators said that the leaves and young shoots could be cooked and eaten in the spring, but one said that he had heard that use described on television, rather than as oral knowledge passed on in the traditional way. Throughout the Northwest, the leaves and shoots were consumed in a similar manner by other nations. Some say that such use was post-contact and introduced by the Chinese, British or other immigrants to the area (Turner et al. 1990; Pojar and MacKinnon 1994).

Medicinal Use

Arthritis/Rheumatism: Three collaborators said that **sdatx** was used to help treat arthritis. Two people said that the young leaves could be brewed into a tea, taken to relieve pain. One person remarked that now you can buy such tea at health food stores. Another person said that sometimes people grabbed the leaves of stinging nettle to help treat arthritis. He had personally used this treatment to help control his pain.

Burns: One person recalled that the juice was extracted from the leaves by grinding it between rocks. The juice was then applied directly to the skin to treat burns.

Miscellaneous: One person recalled that a tea made from the leaves was used as a diuretic and to help treat kidney disease. Two people recalled that the roots are used for medicine but couldn't recall specifically what condition the medicine treated. One said that the roots were cut in small pieces and put in a pot with water, then boiled or simmered, while the other said that her mother used the roots to make an ointment or rub. One person recalled that the roots and leaves were used to make a tea that would help you sleep.

Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga'a use of **sdatx** for spiritual or ceremonial purposes.

Technological Use

Seven people recalled that the inside of **sdatx** stems[43] was used to make twine for making

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[43] As noted for hass (fireweed), it is is the fibres between the cortex and vascular bundle used to make

salmon and eulachon nets. These uses are recorded in the Nisga’a literature (McKay et al. 1986, pg. 166; Nisga’a Tribal Council 1995, Vol. I, pg. 3, and Vol. IV, pg. 67). One collaborator specifically mentioned eulachon nets, which are also described in the Nisga’a literature (Sigidimnak’ Diiks – Dorothy Azak in Nisga’a Tribal Council, Vol. IV, pg. 146). Two people recalled that hair was often woven in with the fibre from **sdatx** to increase the strength. Sim’oogit Ni’isjoohl (Horace Stevens) described the making of twine for nets or sewing as follows:

> *The stem was taken and cut in thin strips and hung to dry. It was used for sewing and makes a really strong twine. Women would mix in long strands of their hair to increase the strength ... but this twine is not as strong as the twine made from **haas*** (2007).

Common eel-grass (unknown Nisga’a name) – *Zostera marina* L.

Family: Zosteraceae (Eel-grass family)

Zostera marina is one of the few vascular plants growing in a marine environment. It is found on the coast on Nisga'a territory (McNeary 1974, 1976), and can be found growing on sheltered sub-tidal muddy flats and in estuaries, particularly in the vicinity of Gingolx.

Food Use

Common eel-grass was discussed with three collaborators. One person knew the species but could not think of any uses and one thought that herring eggs were collected on the leaves, but she wasn’t sure whether the leaves were eaten together with the herring eggs or not.

The Haida were noted to use the leaves for collecting herring eggs (Turner 2004a). Further south, the rhizomes and youngest leaves were eaten for food (Turner and Bell 1971, 1973; Turner 1973).

Medicinal Use/Spiritual Use

No information was reported or recorded for a Nisga’a use of eel-grass for medicinal or spiritual purposes.

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twine. For more information see Barbeau and Beynon (1987).

Technological Use

One person said the leaves were used to weave headbands and other items of clothing.

2.3.4.5. *Damtx* – ferns

Ferns are herbaceous vascular plants but unlike the plants previously discussed, they reproduce by spores rather seed. When discussing ferns with the collaborators, other than differentiating between the roots of **ax** (*Dryopteris expansa*), ferns were described with a single word, "**damtx,**" a general term for fern fronds. When trying to determine if **damtx** referred to one particular species or many, one collaborator said: "...to me, a fern is a fern." This comment reflects the recognition of ferns at a general level only on the part of the Nisga'a collaborators consulted.

Ax – spiny woodfern – *Dryopteris expansa* (C. Presl) Fraser-Jenkins & Jermy

Family: Dryopteridaceae (Wood Fern family)

Dryopteris expansa can be found on Nisga'a traditional territory in mesic (medium moist) to wet forests and at forest edges from low to subalpine elevations.

The term **damtx** is said to be a general word for any fern or fern fronds, including the fronds of *Dryopteris expansa*, but the term **ax** only refers to the root stalk of this species. Short clustered rhizomes and leaf bases of previous fronds, emanating from the caudex (basal stem) of *Dryopteris expansa* are described as looking like a "bunch of bananas" and are eaten as food.

Food Use

Ten collaborators said that **ax** were the roots of *Dryopteris expansa* and were harvested for food. There was some discussion around whether **ax** referred exclusively to the plant and/or the "root stalks" of *Dryopteris expansa* or to the plant and roots of other ferns, such as *Athyrium filix-femina* (lady fern), as well. All said that **ax** only referred to *Dryopteris expansa* and identified *Dryopteris expansa* as the correct species. Six said that the **ax** roots looked like "a bunch of bananas." One other person thought that other fern roots might be eaten, but they were not **ax**. One person said that they tasted like turnips. One person said that the cooked roots tasted like banana, just like the uncooked roots of **t'uuna'akw** (*Typha latifolia*) tasted like banana. He said they were both called "Indian banana" but were different plants. Four people thought that the fronds of *Dryopteris expansa*, like those of any ferns, were generally called **damtx**.

Six people recalled that **a<u>x</u>** "roots" were harvested in the spring. They were cleaned and then the segments were boiled or baked, then peeled, then eaten with grease and sugar. Three people said that people often harvested them at Fishery Bay near the end or just after the eulachon run. Nisga'a lterature confirms these uses (McNeary 1974; Nisga'a Tribal Council 1995, Vol IV, pg. 195; Boston et al. 1996).

Medicinal Use/Spiritual/Ceremonial Use/Technological Use

One collaborator said that the root of some fern was used for toothache, but she wasn't sure which one it was. One collaborator said that the fronds of any fern, including *Dryopteris expansa*, were called **damtx** and could be used to clean fish. She said people would just grab any fern they saw for such cleaning.

Damtx (general term for fern or fern fronds) – ladyfern – *Athyrium filix-femina* (L.) Roth.
Family: Dryopteridaceae (Wood Fern family)

Athyrium filix-femina is found on Nisga'a traditional territory on mesic to wet forests, along streambanks, moist gullies, meadows, swamps and among rock outcrops at all elevations, including cracks and crevices in the lava beds.

Food Use

Twelve people recognized *Athyrium filix-femina* and nine could differentiate between *Dryopteris expansa* (**a<u>x</u>**) and *Athyrium filix-femina* (**damtx**). Six people identified *Dryopteris expansa* as **a<u>x</u>** and *Athyrium filix-femina* as **damtx**. Of these six people, four people said that people only ate the roots of **a<u>x</u>,** but two said that people may have sometimes eaten **damtx** (as *Athyrium filix-femina*) but that the root stalks are smaller and not as good.

Medicinal Use/Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga'a use of **damtx** (as *Athyrium filix-femina*) for medicinal, spiritual or ceremonial purposes. Elsewhere in the Northwest, the Tlingit, Haida and Dena'ina were noted to eat the roots of *Athyrium filix-femina* (Emmons 1991, pg. 446; Emmons 1991; Kari 1995; Turner 2004a). However, due to taxonomic complexities and the similarities in appearance of many fern species, this may be a case of mistaken identity (Turner et al. 1992; Turner 2004a).

The Gitxsan mashed the large green roots stalk of a fern tentatively identified as *Athyrium filix-femina* which they called **damtx** or **demtx** (Smith et al. 1997) together with the bark of "balsam fir" (**alda** or **seeks** – *Abies lasiocarpa* or *Picea* sp.), devil's club (**wa'ums** – *Oplopanax horridus*), the gum of pine (**sginist** – *Pinus contorta*) or spruce (**seeks** – *Picea* sp.) and a little false hellebore (**ts'iks** – *Veratrum viride*). This mixture was warmed and applied to boils or sores. However, the fern used may have been **ax**, *Dryopteris expansa*; see the section on that species for further discussion.

Smith (1929) noted the preparation described above (with the addition of skunk cabbage – *Lysichiton americanus* – root rather than false hellebore root), using *Aspidium spinulosum* for which he gave the common name of "shield fern"[44].

Technological Use

Ten collaborators said that **damtx** fronds generally were used to clean fish and that this could include the leaves of *Athyrium filix-femina*, as well as other large ferns. People said that any big fern could be used, but that some were better than others. It is reported that ferns were used to "stop fish falling apart" but how they were used for this purpose it not clear from the entry (MacKay et al. 1986, pg. 62). Literature for the Northwest notes generally that the leaves of ladyfern were used for spreading out or covering food and for drying berries (Pojar and MaKinnon 1994; Turner 2001).

Damtx (general Nisga'a term for fern or fern fronds; **hababa'a** or **hap'iba'a** in Eastern Gitxsan) – bracken – *Pteridium aquilinum* (L.) Kuhn

Family: Denstaedtiaceae (Bracken family)

Word meaning: The Gitxsan form could be "**haphaba'a**" (from a root "**hap**" meaning 'to cover, ' or perhaps "**haphiba'a**". The late Jeff Harris Sr. (Luus) told Leslie Johnson (pers. comm. 2012) that this Gitxsan word means 'covers to the hips' in allusion to its height.

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[44] Since *Aspidium spinulosum* is not found in BC (Douglas et al. 2002) and the common name of "shield fern" is given to several *Dryopteris* species including *Dryopteris expansa*, it is likely that Smith was referring to *Dryopteris expansa* when describing this treatment.

Pteridium aquilinum can be found on Nisga'a traditional territory in dry to wet habitats along forest edges, bogs, clearings, roadsides and burns from low to subalpine elevations.

Food Use

No information was reported or recorded for a Nisga'a use of **damtx** (as *Pteridium aquilinum*). The Tlingit ate the young "fiddleheads of *Pteridium aquilinum* (Heller 1953; Emmons 1991). The Haida and Tahltan may have eaten the rhizomes of this species as well as the rhizomes of other ferns (Pojar and MacKinnon 1994; Turner 2004a). The Tsimshian (Gitga'at) people considered the roots to be poisonous (Turner and Thompson 2006).

Generally bracken was not used for food by interior peoples. However, in the Southern Interior, the Nlaka'pamux (Thompson) pounded the rhizomes to make flour used in cooking and baking (Turner et al. 1990). The rhizomes were widely used for food by southern coastal peoples (Turner 1995b).

Medicinal Use

One collaborator recalled that the root of some fern was used to put on a tooth to ease the pain of a toothache, but she wasn't sure if it was "this **damtx**" (*Pteridium aquilinum*). The Tlingit noted that the full-grown fronds were poisonous to cattle (Heller 1953). To the south, the Nlaka'pamux peoples prepared several medicines from the fronds and rhizomes, but generally the fronds were used externally as poultices and the rhizomes were pounded and prepared as decoctions to be taken as a drink (Turner et al. 1990).

Spiritual Use

No information was reported or recorded for the use of **damtx** for spiritual/ceremonial purposes by the Nisga'a or any other northwestern nation.

Technological Use

Seventeen collaborators said that **damtx** (as *Pteridium aquilinum*) was the preferred fern used to clean fish (both inside and out) in preparation for smoking. Two people recalled that fish were covered with **damtx** fronds while curing and one of them said that fish were also put on a bed of **damtx** when they were curing because the fronds allowed the fish to breathe and prevented them from fermenting. One person said that her grandmother taught her it was the respectful way to clean fish. Another person recalled that the smell of the ferns kept the bears away from the fish.

In addition to cleaning, covering and curing fish, one collaborator recalled:

> *My mother-in-law told me that way back in the olden days ... before they came across white people, that's* [bracken] *what they used for babies' diapers. They used to gather a lot of it and just put it under the baby and wrap them up with it. That was their diaper. You see them underneath a big tree...all over underneath the tree ... just like a big feather bed* (Sigidimnak̲' Ax̲dii Ksiiskw – Grace Nelson 2008).

However, it is possible that when Sigidimnak̲' Ax̲dii Ksiiskw was recalling this interesting use for **damtx**, she was referring to *Athyrium filix-femina* since that species also turns brown in the fall, looks more like a feather, and would be a softer diaper or bed for babies. The Haida used various types of ferns for bedding (Turner 2004a).

Ts'ak'a aam – licorice fern – *Polypodium glycyrrhiza* D.C. Eaton

Family: Polypodiaceae (Polypody family)

Polypodium glycyrrhiza is found on Nisga'a traditional territory on the shaded or mossy underside of tree trunks or large branches, wet mossy logs, ground along forest edges and under overhanging rocks on the lava beds and other rocky areas from low to subalpine elevations.

Food Use/Spiritual Use/Technological Use

No information was reported or recorded for a Nisga'a use of **ts'ak'a aam** for food, spiritual/ceremonial or technological use.

The Haida, Tlingit and Tahltan peoples used the roots/rhizomes for food (Albright 1982; Emmons 1991; Turner 2004a). The Gitga'at Tsimshian chewed the licorice-like roots, in very small amounts, as a treat and also chewed the root to stave off hunger (Turner and Thompson 2006).

Medicinal Use

Anaesthetic: One person thought that the root/rhizome might have been put on a sore tooth to ease the pain of toothache.

Chest Infections/Colds/Bronchitis/Tuberculosis: Five people said that the roots/rhizomes of **ts'ak'a aam** were used to treat infections related to cold and coughs. Three said the roots were chewed; one said they were sometimes mixed with eulachon grease and one person specified that roots were picked in the fall, boiled on the stove for a day, drained and taken as a drink.

Miscellaneous Use: One person recalled that **ts'ak'a aam** was mixed with **wa'ums** (devil's club – *Oplopanax horridus*) to make a powerful medicine for treating unspecified illnesses. Another person said it was mixed with other medicines to sweeten them and make them more palatable.

The Gitga'at, Tsimshian and Haida used the roots/rhizomes for treating various throat and chest conditions (Turner 2004a; Turner and Thompson 2006).

Damtx – northern maiden hair fern – *Adiantum aleuticum* (Rupr.) Paris

Family: Pteridaceae (Maidenhair Fern family)

Adiantum aleuticum is found on Nisga'a traditional territory on moist sites along streams and riverbanks, in moist forests at low to middle elevations. It is more common south of 55^{o} N latitude but specimens have been collected north of that as well.

Food Use/Medical Use/Spiritual/Ceremonial Use

No information was reported or recorded for the use of this **damtx** for medicinal or spiritual/ceremonial purposes by the Nisga'a or any other northwestern nation. The Tlingit used unspecified parts of maiden-hair fern (reported under the synonym of *Adiantum pedatum*) as a tea for treating consumption (Emmons 1991, pg. 364).

Technological Use

No information was reported for a Nisga'a use of **damtx** for technological purposes. Nisga'a literature recorded that

> *...tump lines woven from mountain goat wool and cedarbark, grasses and fern stems ....and that glossy black ferns were often woven in the down...* (Boston et al. 1996, pg. 118, and 121).

Pojar and MacKinnon (1994, pg.425) note that *Adiantum pedatum* (syn. *aleuticum*) “lustrous dark-brown to purplish black erect stipes” so it is likely that Boston et al. (1996) were referring to *Adiantum aleuticum.* In other areas of the Northwest, only the Tlingit were noted to use the stem of maiden-hair fern (as *Adianatum pedatum*) for a purple dye (Emmons 1991, pg. 215). The Haida and Tlingit on the Northwest Coast, and the Makah and Quinault in Washington, used the black stems in basket weaving (Turner 2001a).

2.3.4.6. *Fern Allies*

Like the ferns, the fern allies are herbaceous vascular plants that reproduce by spores rather than by seeds. There are several *Equisetum* (horsetail) and *Lycopodium/Huperzia* (clubmoss) species found on Nisga’a traditional territory. For the horsetails, the research collaborators did not distinguish among *Equisetum* species, but just called them all **maawil**, which is also the Nisga’a word for sandpaper. For the clubmosses, only the genus *Lycopodium* was discussed and the collaborators were not very familiar with any particular species.

Maawil(x) – horsetail – *Equisetum* species. Family: Equisetaceae (Horsetail family)
Several *Equisetum* species are found on Nisga’a traditional territory in various, usually moist, habitats.

Food Use

One collaborator, when examining a specimen of **maawil** (as *Equisetum arvense*), recalled that:

> *Oh yes, they grow here and they grow fatter than this. You just take the top off and then you stick it in you mouth and it has a milky taste to it ... it’s food but they say it is very good for your body ... it is what the moose and bears really like. There is a lot on the highlands. It grows really big and fat and that's what we eat.* (Sim’oogit Ni’isjoohl – Horace Stevens 2007).

Three other collaborators didn’t think people ate it but recalled that it was eaten by horses; one person thought that it might help horses digest their food. Other northwestern nations used horsetail for food as well.

The Gitxsan have a legend that the liquid from horsetail was the only source of liquid before water came into world (People of 'Ksan 1980, pg. 94). The Haida ate the young shoots of unidentified *Equisetum* species, although both Norton (1981) and Turner (2004) thought it was *Equisetum telmateia*. The Dena'ina of Alaska also harvested the young soft, sweet "tubers" (rhizomes), of *Equisetum* species as the first "fruit" or "berry" of the season (Kari 1995). The liquid found in the hollow stems was an important source of liquid for hunters (Pojar and MacKinnon 1994).

Medicinal Use

Two collaborators recalled that *Equisetum* species had medicinal use, although one of them couldn't recall a specific application. Three other people recalled "that it was medicine for horses; one of them said "... they put the whole thing [the stem and branches] and mix it with the hay ... it's some kind of a laxative. (Sigidimnak' K'igapks – Alice Azak 2007).

Skin Disorders: One collaborator said that the juice from **maawil** is good for treating dry skin and rashes, like "eulachon grease." In other areas of the Northwest, the Dena'ina, Haida and Tsimshian were noted to use *Equisetum* species for unspecified medicinal purposes (Kari 1995; Turner 2004a; Turner and Thompson 2006).

Spiritual Use

No information was reported or recorded for the use of **maawil** for spiritual or ceremonial purposes by the Nisga'a or any other northwestern nation.

Technological Use

Five collaborators recalled that **maawil** was used as an abrasive, before sandpaper was introduced. Sim'oogit Ni'isjoohl described the preparation as follows:

> *The old people used it ... it's sandpaper you can use it for. And when I first moved home, I used to carve and you have nowhere to go to buy anything if you don't have it so I go out* [and gather **maawil**] *and make it. You take the stuff off* [leaves and branches] *and squeeze the juice out of it* [the stem] *and then you flatten it out, and take all the milk* [juice] *out of it and you put them away to dry ... it will never rot, eh ... and then you flatten them … you make a whole bunch and then you put them in between two boards and then you dry*

> *them…and you use them for sandpaper. You can cut anything with them* (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

One person said they were also used as pot scrubbers. Another person, when presented with a sample of *Equisetum hyemale*, said that "...both this one [indicating the sample] and the one with little branches are called **maawil** (Sigidimnak' Ẃii Ts'iksna'aks – Pauline Grandison 2008). Other northwestern nations used various species of *Equisetum* for smoothing and sanding (Albright 1981; Smith et al. 1997; Turner 2004a).

Bilaana ẃatsx – stiff club-moss – *Lycopodium annotinum* L.;
Running club-moss – *Lycopodium clavatum* L.
Family: Lycopodiaceae (Club-moss family)
Lycopodium annotinum is found on Nisga'a traditional territory in moist forests, on forest edges, around bogs and on rocky areas with thin soils, from low to subalpine elevations. *Lycopodium clavatum* is found on Nisga'a traditional territory from the lowlands to the tundra in similar habitats to *L. annotinum* but it can tolerate somewhat drier conditions and acidic sandy soils.
Nisga'a word meaning: literally 'belt (**bilaan**) of otter', it probably refers to a trailing plant. In Tsimshian there is *bilaana wan*, lit. 'belt-of deer', a creeping plant with branches that look like tiny deer antlers.

Food Use/Medicinal Use/Spiritual/Ceremonial Use

Bilaana ẃatsx (as both *Lycopodium annotinum* and *L. clavatum*) was discussed with only four collaborators but no information was reported or recorded for a Nisga'a use of either species for food, medicinal, spiritual or ceremonial purposes.

The Haida used *Lycopodium clavatum* for unspecified medicinal purposes (Turner 2004a). In the far north, the Aleut used an infusion of *L. clavatum* for postpartum pain (Bank 1953). The Gitxsan, who called *Lycopodium* species **bilana 'watsx**, used *L. clavatum* to dry nosebleeds, and treat diaper rash and other wounds (Anonymous 1998). The southern Carrier inserted the "moss" into the nose to cause bleeding to relieve the pressure of headaches (Smith 1929). Gitxsan shamans also dramatized his healing powers by throwing the powdery spores of *Lycopodium clavatum* into the fires to create firework-like effects (Anonymous 1998).

Technological Use

One collaborator recalled that the greenery from **Bilaana ẃatsx̱** was wrapped around branches of **haxwdakw** (western yew) to make wreaths for feasts, as well as for Christmas and Easter. It is most likely that she was referring to *Lycopodium clavatum*, since it is bushier than *L. annotinum* and the viney nature of the stems make it more conducive to "wrapping around." The Haida and Tlingit also used it for wreaths; the Haida name translates to "deer's belt" (Pojar and MacKinnon 1994, 1991; Turner 2004a). People in the southern part of BC also used it for decoration (Palmer 1975; Compton 1993).

Windo'o' (tentative identification) – Chinese clubmoss, Pacific fir-moss – *Huperzia chinensis* (Christ) Czern. (syn. *Lycopodium selago* ssp. *chinense* (Christ) Hultén; *L. selago* ssp. *miyoshianum* (Makino) Calder & Roy L. Taylor; *L. selago* var. *miyoshianum* (Makino)). Family: Lycopodiaceae (Club-moss family).

Huperzia chinensis (syn. *Lycopodium selago*) is found on Nisga'a traditional territory at low to middle elevations in mesic to wet rocky places on moss-covered rocks and logs in forests, near ponds and along rocky shelves, especially on the lava bed shelves (Gorman 1896; E-Flora BC). A similar species, *Huperzia haleakalae* (Brack.) Holub (syn. *Lycopodium selago* ssp. *patens*), called Pacific clubmoss or alpine fir-moss (E-Flora BC) is also found scattered throughout the territory but in dry rather than moist rocky outcrops and only from subalpine to alpine elevations.

The use of a plant known as **windo'o** to alter states of consciousness has been part of Nisga'a tradition for a long time. In Nisga'a origin stories, **windo'o,** in the form of powder (sprinkled from above), or pellets (known as **do'o**, and held in the cheek) is used to alter and/or control behaviour.

> *As Son of Luulak̲' and Amgat approached the guard* [as they tried to gain access to one of the villages belonging to the Chief of Heaven] *he* [the guard] *suddenly started screaming and yelling. Whereupon they quickly took a piece of **windo'o** and shoved it into his open*

> *squawking mouth. This was the guard's first taste and experience with **windo'o** and so the effect was quick and quite overwhelming ... and the guard became quiet* (Nisga'a Tribal Council 1995, Vol. I, pg. 29).
>
> *We were nearly overcome in this last village said Son of Luulak', so we will sprinkle a little of this **windo'o** when we pass over the village tomorrow, it should affect them and help us when we pass over them (*Ibid pg. 31).
>
> ***Windo'o** was clearly their most valuable weapon in dealing with nervous guards. The symptoms of those taking **windo'o** were much the same as that of taking an aphrodisiac. The person's motions became quite unorthodox. This powdery substance was very effective* (Ibid, pg. 32).

Food Use/Medicinal Use/Spiritual/Ceremonial Use /Technological Use

The use of **windo'o** to alter states of consciousness was also mentioned by research collaborators and other Nisga'a citizens as a plant that parents or grandparents told them was found in the mountains and it would "make you high." However, no one could identify a particular species. One person chuckled as he recalled that "... my dad would never tell me which plant it was; he didn't want me to wander around getting high, I guess."

After completing the collaborative interviews, it was incidentally noted that Gorman (in Greene 1896, pg. 80) said:

> *Lycopodium selago which occurs from sea level up to about 1000 feet elevation, on moss-covered rocks and logs in coniferous forests and on the borders of beaver ponds ... is employed by all the tribes along the coast to produce a sort of intoxication, which is induced by simply chewing the stems and swallowing the juice.*

A search of the literature on *Lycopodium selago* confirms that it contains alkaloids which may have hallucinogenic and other medicinal properties (Felgenhauer et al. 2000). It is likely that the Nisga'a term **windo'o** refers to a *Lycopodium* species, based on the cumulative evidence presented here. *Huperzia chinensis* (syn. *Lycopodium selago*) and/or *Huperzia haleakalae* (Brack.) Holub (syn. *Lycopodium selago* ssp. *patens*) are both found on Nisga'a traditional territory, and Gorman observed that *L. selago* produced intoxication and was widely used by Nations along the coast. Current research has shown further that it contains alkaloids which may have hallucinogenic properties.

Other researchers suggest that **windo'o** is actually a mix of two or three species. (Compton pers comm. 2011; Corsiliglia pers. comm. 2011). The Coastal and Southern Tsimshian word for *Nicotiana quadrivalvis* var., *N. tabacum* (wild tobacco) and (*N. tabacum* ("whiteman's" chewing tobacco) is **windó** (Turner 2011).

Plants of the genus *Lycopodium* has been used for hundreds of years for herbal medicines around the world (Whitebread 1941; Kelly and Knopman 2008), and research into their medicinal potential is ongoing. For example, current research shows that *Lycopodium serrata* may have value for enhancing memory and treatment for Alzheimer's disease (Kelley and Knopman 2008).

Huperzia chinensis (syn. *Lycopodium selago*) and other *Lycopodium* species are similar in appearance. Several *Lycopodium* species are found on Nisga'a traditional territory, as well as areas of the Northwest, and some can easily be confused with others. *Lycopodium clavatum* was traditionally used by the Aleut people for postpartum pain (Bank 1953) and was widely used in south-central Europe for various dermatological preparations as well. Because of its continued use as an herbal medicine and the presence of poisonous alkaloids, it has been thoroughly screened in modern times (Orhan et al. 2004; Pieroni et al. 2004). However, *Lycopodium selago*, not so widely screened, is known to have higher toxicity. In fact, it has been ingested in error by some, causing problems which required hospitalization (Felgenhauer et al. 2000). Clearly, further investigation about the possible hallucinogenic and other medicinal properties of *Lycopodium* species is needed. It is not recommended that *Lycopodium* species be used for medicinal or recreational purposes before there is further study.

2.3.4.7. *Graminoids – grasses, sedges, rushes*

Many grasses, sedges and rushes grow in suitable habitat from lowland to alpine regions on Nisga'a traditional territory. As well as native grass species such as *Elymus glaucus* Buckley (blue wildrye), *Calamagrostis canadensis* (Michx.) P. Beauv. (bluejoint), *Phalaris arundinacea* L. (reed canarygrass), and *Cinna latifolia* (Trevis. ex Goepp.) Griseb. (wood reedgrass), there are many introduced species such as *Phleum pratense* L. (timothy) and *Festuca rubra* L.subsp. *rubra* (creeping red fescue). Sedges and rushes were also discussed generally as "grass-like" and not distinguished at the species level.

Hap'iskw – grasses, sedges, rushes – Families: Poaceae (Grass family), Cyperaceae (Sedge family), Juncaceae (Rush family)

Nisga'a word meaning**:** This word means literally "covering," is a verbal derivative of the root "**hap**," 'to cover.' It applies to grass and grass-like vegetation forming a green cover.

Food Use, Medicinal Use/Spiritual/Ceremonial Use

The research collaborators were generally not interested in discussing any of the grasses, sedges or rushes found on their traditional territory and could not recall specific names for any Poaceae, Cyperaceae or Juncaceae species. The word **hap'iskw** was given as a general name for any grass, or "grass-like" sedge or rush. No information was reported or recorded for the Nisga'a use of any particular grass or grass-like species for food, medicinal, or spiritual/ceremonial purposes. Two people considered that grasses now were just a nuisance and needed to be cut but also suggested that animals liked to eat some grasses so they were probably important to have around.

Technological Use

One collaborator recalled that **gal'ink** (food storage boxes) were lined with half-dried grasses and that grasses were also used to cover fish when cooking them in fire pits; however, he could not recall a particular grass species. Four collaborators thought that different grasses, sedges or rushes might have been used to weave hats or baskets. Tump lines were sometimes woven from different grasses (Boston et al. 1996). Archival research revealed that the Nisga'a wrapped their feet in dried grass for insulation inside their moccasins (Pierce 1933).

The Gitxsan used various kinds of grasses for stuffing their moccasins, for babies' mattresses and for sitting on. Their name for grasses is **habasxw** (Turner 2001a).

Several grass species were used for decoration and basket making by the Dena'ina and the Tanana people (Kari 1985, 1995), Haida (Turner 2004a), Tlingit (Emmons 1991, Turner 2001a) and other northwest nations (Pojar and MacKinnon 1994, Turner 2001a).

2.3.4.8. ***Mosses and Liverworts***

Bilak – moss (general term for all mosses and some lichen species).

Hisseeksgwit or hists'exhit[45] – juniper haircap moss – *Polytrichum juniperinum* Hedw. Family: Polytrichaceae (Polytrichum family)

Haluugibins[46] – large leafy moss – *Rhizomnium glabrescens* (Kindb.) Kop *(syn. Mnium glabrescens* Kindb. or probably any of the leafy mosses of the *Rhizomnium*, *Mnium*, and *Plagiomnium* genera. Family: Mniaceae (Mnium family)

Umhlkw – peat moss – *Sphagnum* spp. Family: Sphagnaceae (Sphagnum family)

Nisga'a word meanings: Bilak seems to refer to any kind of dry, soft, thick moss or lichen. People travelling used to carry a pouch full of dried moss for tinder, this pouch was called **andibilak** (**andi-** is a prefix in some words referring to containers (Tarpent 2011). **Umhlkw** is formed on the root '**u'** meaning 'cover, protect'. The plant, when dried, is very absorbent and was formerly used for diapers and sanitary napkins, thus providing protection. **Hists'exhit'** or **hisseeksgwit [hees sayux hut]** translate to "**his**" (one imitating), **ts'ex** (juniper) or **seeks** (spruce).

The non-vascular plants classified as bryophytes (mosses and liverworts) found on Nisga'a traditional territory are typical of those found in suitable habitats in the Northwest. Information with respect to the Nisga'a use of specific mosses was not reported by any of the collaborators and only the use of one liverwort, *Conocephalum conicum,* was recalled by one collaborator. Nevertheless, a number of different mosses and their Nisga'a names were recalled or recognized by collaborators or discussed in the literature.

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[45] **Hisseeksgwit** or **hists'exhit** are phonetic interpretations from McNeary (1974b); standardized spelling suggested by Sigidimnak' Ts'aa Gabin Verna Williams (2010) and Marie-Lucie Tarpent (2011).

[46] **haluugibins**' is also a tentative spelling of McNeary's phonetic interpretation (1974b), spelling suggested by Marie-Lucie Tarpent (2011).

Mosses were discussed generally with seven collaborators and all recalled that **bilak** was a general term for any moss and even some lichen species. Three people recalled that *Sphagnum* species were called **umhlkw** and this term is also noted in the Nisga'a literature (Nisga'a Tribal Council 1995, Vol. IV).

Specimens of **haluugibins** (*Rhizomnium glabrescens*) and **hisseeksgwit** or **hists'exhit** (*Polytrichum juniperinum*) were shown to four collaborators. No uses were recalled but three people suggested that because they had a name they were probably used for something.

Food Use/Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga'a use of mosses in general or any particular moss for food, spiritual or ceremonial purposes. The Tahltan ate the boiled the stomach contents of caribou in the winter, which consisted of fermented mosses and lichens (Albright 1982).

Medicinal Use

One collaborator said that if moss was found on the stems of **wa'ums** (devil's club) when making medicine, it was considered part of the medicine.

Although no use was recalled for the two species **haluugibins (***Rhizomnium glabrescens***)** and **hisseeksgwit** or **hists'exhit'** (*Polytrichum juniperinum*), these and similar species were traditionally used for medicinal purposes by other nations in British Columbia. The southern Carrier people boiled the entire aboveground parts of *Mnium affine* (syn. *Plagiomnium drummondii* – Drummond's leafy moss) and used two or three cupfuls of the decoction to bathe a swollen face (Smith 1929). Similarly, the Bella Coola applied the leaves of *Rhizomnium glabrescens* (shiny large leafy moss) externally as a poultice for infections and swellings, blisters and abscesses (Turner 1973).

The leaves of another *Polytrichum* species, *P. commune* (common haircap moss), were used to speed up the process of childbirth by the Ditidaht people on Vancouver Island (Turner et al. 1983). Possibly the species identified by McNeary (1974b) as **hees sayux hut (***Polytrichum juniperinum* – juniper haircap moss) was *P. commune* and it too had been used by the Nisga'a for a similar purpose or that the two species were interchangeable for such use.

Technological Use

One collaborator recalled that mosses that didn’t dry out were used in making wreaths. Two collaborators recalled that **umhlkw** (*Sphagnum* spp.) were used for diapers, to line cradles and for menstrual pads. These uses are consistent with uses by other northwest nations (Albright 1982; Emmons 1991; Pojar and MacKinnon 1994; Turner 2001a, 2004a). The Haida also used various mosses, including sphagnum species, for stuffing pillows, for mattresses and for chinking cabins as well (Turner 2004a). The Tlingit used unidentified tree moss for brown dye (Emmons 1991).

Gwil-hathit' – seal’s tongue – *Conocephalum conicum* (L.) Dumort
Family: Conocephalaceae (Conocephalum family)
Nisga’a word meaning: The root “**hit”** translates to 'to stick to something'
Conocephalum conicum is a thalloid (somewhat amorphous, leaf-like) liverwort, a non-vascular plant related to mosses, found on Nisga’a traditional territory in damp, shady areas near or between rocks along rivers and streams and on damp forest floors from low to subalpine elevations. It grows on mildly base-rich to neutral substrates (Long n.d.).

While discussing traditional plant use with Sigidimnak̲’ Ẃii Ts’iksna’ak̲s (Pauline Grandison 2008), she recalled the following:

> *... my mother had cancer on her breast – well she didn't know if it was cancer with this swollen breast – and there were no doctors there and her breast was really swollen, and so this man came over and he poked it with a sharp knife and this stuff comes out; it was just blue and she was really sick. The next day she* [my mom] *told my dad to take us to Gitlax̲t’aamiks* [Old Aiyansh], *where the creek was, I think it was in winter, and we went there and we picked these things. She used a hammer until it was really all mushy ...she smashed it with a hammer, really fine. Then she warmed the pitch from the tree* [species not identified but probably **ho’ok** or **alda** *Abies lasiocarpa* or *A. amabilis*] *... you don't boil it, just heat it until*

> *it's hot and then mix that* **gwil-hathit'** *with it. She put it on brown paper and put it on the wound, it takes the whole thing out of her breast. It takes the stuff out – a lot of stuff – and it takes the whole thing out of my mother's breast. Way after, she went to see the doctor and the doctor found the roots of the cancer on her breast ... .*

Sigidimnak’ Ẃii Ts’iksna’aks said that **gwil-hathit'** grew along streams but she said she could not recall a common English name. Given that she described this plant as small and “looking like Christmas cactus growing close to the ground,” that it was found in wet places along stream edges, and that **“hit’** translates in English to mean “sticks to or close to the ground,” it was thought that **gwil-hathit'** might be a bryophyte or lichen. In subsequent meetings, Sigidimnak’Ẃii Ts’iksna’aks examined several different taxa (including small vascular plants and lichens) but said none of these were **gwil-hathit'**. She recalled that her sister saw it growing along the Old Greenville Road near Laxgaltsap. A search of that area alongside the river revealed *Conocephalum conicum*, the lobes of which do somewhat resemble the photosynthetic stems and branches of Christmas cactus (*Schlumbergera* sp.). A sample was collected and Ẃii Ts’iksna’aks identified it as **gwil-hathit'**.

In a subsequent group meeting with collaborators, Sim’oogit Bayt Ńeekhl (Jacob Mckay) recalled that **gwil-hathit'** was an important ingredient in his grandmother’s medicines. Further review of the literature revealed that in 1974 a sample of *Conocephalum conicum* was positively identified by the Prince Rupert Ethnology Division and given the Nisga’a name **gwil-hathit'** (recorded as “**qual ah tate**”; McNeary 1974b).

Food Use/Spiritual/Ceremonial Use/Technological Use

No information was reported or recorded for the use of **gwil-hathit'** for any purposes by the Nisga’a or any northwestern First Nation. The Haisla and Hanaksiala used the plant to make green paint (Compton 1993).

Medicinal Use

Cancer: As noted above, one collaborator recalled that **gwil-hathit'** was used to treat breast cancer.

Skin Disorders: Two collaborators suggested that **gwil-hathit'** might have been used to treat infections of the skin.

The Haida used this species for unspecified medicinal purposes (Turner 2004a). To the south, the Haisla and Hanaksiala used the pulverized leaves mixed with mountain goat fat to treat sunburns (Compton 1993), and the Dididaht on Vancouver Island used it for eye problems such as the treatment of cataracts and for kidney problems (Turner et al. 1983, Turner in Pojar et al. 1994).

Conocephalum and related species have been used for medicinal purposes in other parts of the world as well. For example, a mixture of *Conocephalum conicum* and *Marchantia polymorpha* is mixed with vegetable oil and used on bites, boils, burns, cuts, eczema and wounds (Wu and Jia 2003; Ando 1983 in Glime 2007). In Hawaii, a similar thalloid liverwort (which resembles *Conocephalum conicum* in an illustration), found on wet to damp lava tubes, was used traditionally in its fresh state for unspecified medicinal purposes (McBride 1975).

Flavonoids[47] of *Conocephalum conicum* and other *Conocephalum* species, as well as the flavonoids found in other plants are under investigation for their ability to inhibit the growth of cancer cells (Yerma et al. 1988; Pawlikowska-Pawlega et al. 2000; Pawlikowska et al. 2005; Glime 2007; Harinantenaina et al. 2007). In addition, the potential of other secondary compounds found in *Conocephalum conicum* are being studied for their anti-viral, anti-bacterial and anti-fungal abilities (Castaldo-Cobianich et al. 1988; McCutcheon et al. 1994, 1995; Glime 2007; Harinantenaina et al. 2007).

2.3.4.9. *Lichens*

Bilak (Nisga'a name for moss and soft lichens) – *Alectoria* species

Lichens are a combination of fungi and algae living in a symbiotic relationship – the outer fungi provide protection for the algae growing inside them. The algae in turn

[47] Flavonoids collectively known as Vitamin P and citrin are secondary aromatic compounds being studied for their antioxidant and anti-inflammatory properties. Accessed on: 3 August 2011: http://www.babylon.com/define/18/Biology-Terms.html; http://medical-dictionary.thefreedictionary.com/Flavonoid).

provide the fungi with nutrition in the form of carbohydrates. Lichens grow on a variety of substrates ranging from rock, bare soil and rotten logs to tree branches and bark of varying ages. All forms are found on Nisga'a traditional territory in suitable habitats.

The lichen community on the lava beds is very rich, with more than 250 different species, some of them rare in Canada (Trevor Goward pers. comm. 2011). These lava lichens (e.g., *Stereocaulon* spp., and *Cladina* spp. – reindeer lichen), called primary colonizers, are the first plants to establish on otherwise barren earth or rock. Other lichen species, some of which are secondary colonizers and some of which are limited to old-growth forests, are found in abundance throughout the Nass.

Lichens as a life form were discussed generally with seven collaborators who recalled seeing them and knew that they had some traditional use. Five of them said that some lichens were called **bilak**, which is the general term for moss and moss-like plants or lichens.

Food Use

One collaborator recalled that her grandmother told stories about lean people who had only small holes for their mouths and could only eat worms and lichen. She thought perhaps she was told these stories to stop her from trying to eat lichens.

The Tahltan ate the boiled fermented stomach conents of caribou, which contained lichens (Emmons 1991). The Tsimshian and probably other northwest peoples ate *Bryoria* spp. tree lichen (Turner 1995b, 2004). A recent study suggests that *Bryoria fremontii*, when cooked with other foods, releases digestible carbohydrates that would otherwise be lost, increasing their availability by 23 to 122% (Crawford 2007).

Medicinal Uses

No information was reported for a Nisga'a use of any lichen species for medicinal purposes, nor was there information in the Nisga'a literature consulted. In other areas of the Northwest the Tlingit applied dried, powdered *Peltigera* spp. to burns and scalds, after treatment with mud and seal oil covered with fresh chiton skins (Emmons 1991, pg. 362). Further south, the Oweekeno people also used *Peltigera* spp. for treating wounds. The Haida used *Lobaria* spp. and *Peltigera* in a variety of medicinal preparations (Turner 2004a). The Gitga'at people boiled *Lobaria oregana* or *Peltigera* spp. to treat sore throats. They also mixed either of these species with juniper for preparing other medicines (Turner and Thompson 2006). The Nitinaht used *Peltigera canina* and *P. apthosa* to treat urinary tract problems and *P. apthosa* to treat tuberculosis (Turner 1983). In the far north, the Aleut people drank a tea made from *Cladina* spp. for chest pains and to prevent becoming "winded" when climbing steep hills (Smith 1973).

Spiritual/Ceremonial Use

No information was reported or recorded for the spiritual or ceremontial use of any lichen species use by the Nisga'a or any other northwest First Nation.

Technological Use

Three collaborators recalled that some kinds of lichen were used for fire starter. Two people thought that the ones that "hang from trees" (*Usnea*, *Alectoria* or *Bryoria* spp.) were the best for this purpose, but one person said any dry lichen would work. The Haida used *Usnea longissima* to strain impurities from pitch before it was used in medicine (Turner 2001a, Turner 2004a). In other areas of the province, the Nitinaht used this and other lichens as temporary bandages, as well as for wiping salmon, baby diapers and sanitary napkins (Turner et al. 1983).

The Nisga'a made a dye from "wolf moss" (*Letharia vulpina* (L.) Hue) (Boston et al. 1996, pg. 126-127). Three people talked of a small red lichen that was used to make a dye for canoes. In a subsequent field trip Sigidimnak' K'igapks (Alice Azak) pointed to a *Cladonia* species with red soredia found on the lava beds as the one used for this purpose. This species is likely *Cladonia borealis* S. Stenroos (Trevor Goward pers. comm. 2010). Sim'oogit Gadim Galdoo'o (Charles Alexander 2008) recalled:

> *My grandfather took the orange stuff growing on rocks and dried it until it fell off the rock ... it's just like powder and he mixed it with the roots of soapberries and clay to make a dark Indian red for dying cedarbark.*

Trevor Goward suggested that this was likely a species of *Xanthoria* which does grow on rocks, and was used traditionally as a dye (Goward pers. comm. 2010).

Smith (1929) described the Gitxan use of "lichen on pine" to make yellow dye.[48]

[48] Leslie Johnson (pers. comm. 2012) tentatively identified this species as *Vulpicida canadensis* (formerly

They also obtained *Letharia vulpina* in trade to dye mountain goat wool yellow (Samuel 1982). The Tlingit also used various lichens for dyes (Emmons 1991).

Three genera common on both Nisga'a and Gitxsan territories were given distinct names by the Gitxsan. *Alectoria* spp. were called **hla ýimkhl gan** which translates to 'the beard of the tree'; *Bryoria* spp. were **ges Ẃiiget**, which translates to 'hair of Ẃiiget'; and *Usnea* were **hla umhlxwhl sginist**, which translates to 'the sphagnum moss of the pine.' The Gitxsan names contain words common in the Nisga'a language: **gan** is tree and **sginis(t)** is pine, and probably reflect the substrate on which a particular species was found. Given the close proximity of the cultures and the number of plants and plant names they have in common, it is possible that the Nisga'a may have had similar names for these types of lichens. Although there were no Nisga'a or Gitxsan uses recorded, the fact that the Gitxsan had specific names for them suggests that such lichens may have been traditionally important but their specific uses have been lost over time.

2.3.4.10. *Fungi*

Gayda ts'uuts' – mushrooms – *fungi*

Many edible and non-edible fungi are found in the forests of Nisga'a traditional territory.

Food Use

No information was reported or recorded for a traditional Nisga'a use of any fungi for food. Generally speaking, in the past, northwestern nations did not eat mushrooms (Kuhnlein and Turner 1996). However, eight collaborators said that, in the present day, they or members of their family annually harvest *Tricholoma magnivelare* (Peck) Redhead (pine mushroom), *Sparassis crispa* (Wulfen) Fr. (western cauliflower mushroom), *Laetiporus conifericola* Burdsall & Banik (chicken mushroom) and other edible species for personal use and profit.

The fungus *Exobasidium vaccinii* (Fuckel) Woronin, found growing on shoots of members of the Ericaceae family (especially *Menziesia ferruginea*) (E-Flora BC), was discussed with eleven collaborators, but no one recalled hearing about it or seeing it. The Coast Tsimshian Gitga'at people occasionally ate this fungus (Turner and Thompson

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Cetraria canadensis).

2006), as did the Heiltsuk and Hanaksiala people (Compton 1993).

Medicinal Use

Seven collaborators recalled that a fungus that grows on the trunks of some trees was used for medicinal purposes; three described a procedure, known as **mihlxkws**,[49] (moxibustion) (Figure 2.5) that was used in the treatment of different medical conditions. Sim'oogit Gadim Galdoo'o (Charles Alexander) subsequently identified the fungus *Fomitopsis* spp. by the Nisga'a name of **dihuxwt** and said that although the fungus could be found on other tree species, the medicine must be made from the fungus growing on **seeks** (spruce – *Picea sitchensis*). However Nisga'a literature suggests that fungi from **giikw** (hemlock – *Tsuga heterophylla*) and **ambokkw** (aspen – *Populus tremuloides*) were also used for **mihlxkws** (McKay et al. 1986, 2001). The fungus growing on aspen has been tentatively identified as aspen trunk rot (*Phellinus tremulae* (Bondartsev) Bondartsev & P.N. Borisov; Allen et al. 1996).

Arthritis/Rheumatism: Sim'oogit Gadim Galdoo'o said that **dihuxwt**, is brown or black on top and white underneath and grows on half-dead spruce trees. It was used to treat arthritic or theumatic conditions. He was adamant that the fungus from hemlock or other trees is not good to use, because it is too soft.

The Gitxsan used a fungus called **tiiuxw** and identified as *Inonotus obliquus* (Pers.: Fr.) Pilát found on birch (*Betula papyrifera*) or hemlock to treat rheumatism (Smith 1929, Gottesfeld 1992b, Smith et al. 1997).

Skin Disorders: Four collaborators recalled that **dihuxwth** was used to treat open wounds and sores to draw the pus out. One person said that only the fungus taken from **seeks** could be used for this treatment, while others did not identify a specific host tree.

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[49] **Mihlxkws** is a form of moxibustion treatment. Moxibustion is described in the American Heritage Medical Dictionary as the burning of the skin to produce analgesia (2007).

Figure. 2.5. Sim'oogi Gadim Galdoo'o (Charles Alexander) demonstrates **mihlxkws** treatment with fungus.

Unspecified Use: One collaborator identified an unknown mushroom used for a variety of medicinal purposes:

> *Okay, there is a mushroom that we don't have here and we traded yew wood with the Telegraph Creek people* [for it]. *You've heard about the Grease Trail … it goes right from here to Telegraph Creek ... my grandfather walks to there from here … it took him nine days to walk to Telegraph Creek … that's when he found out … it was in the 1800's … that's when he found out about it ... one old person showed him a great big mushroom that he had … it's different sizes, could be almost eight inches in diameter, light brown in colour .... you soak it for a month you know ... some people, they soaked it for almost two months before you take it … you strain it and then you drink it ... it cures all things ... we call it* ***gayda ts'uuts's*** (Sim'oogit Gadim Galdoo'o – August 2008).

Other collaborators could not recall ever being told about a mushroom species used or traded with the Tahltan, so its identification remains a mystery to date. Northwest of Tahltan territory, the Upper Tanana people prepared a bracket fungus growing on spruce trees for medicine by cutting small pieces and boiling it with *Rhododendron groenlandicum* (Labrador tea) and spruce tips and drinking the concoction to treat any kind of ailment.

The Haida imported *Echinodontium tinctorium* Ell. & Everh (Indian paint fungus) from the Tsimshian and made a powder from it for unspecified medical conditions

(Newcombe 1897 in Turner 2004a). Presumably the Tsimshian used this species, perhaps medicinally, as well. In the Arctic, the bracket fungus *Inonotus obliquus* was used as a laxative and as an insect repellent (Smith 1973). The Hanaksiala made a decoction of ground *Fomitopsis officinalis* (Ville ex Fries) taken from spruce trees to treat tuberculosis (Compton 1993).

A mushroom species called **t'ukw'a luulak'**[50] (which translates to 'ghost's bellybutton,' puffball, – *Bovista pila* Berk. & M.A. Curtis) was discussed with three collaborators. However, no use was recalled. One collaborator said there used to be lots of **t'ukw'a luulak'** around. Further north, the Dena'ina and Tanana mixed the spores of puffball with water and applied the mixture to sores; they also sprinkled the spores directly into the eyes to clear them (Kari 1985, 1995). This practice of sprinkling the spores into the eyes is in direct contrast to Haida tradition where people were warned against touching puffballs because the spores might explode and irritate the eyes (Turner 2004a). On the Mid-Coast of BC, the Bella Coola people dusted the spores from puffball on wounds, sores from gonorrhoea and other oozing sores (Smith 1929).

Spiritual/Ceremonial Use

No information was reported or recorded for a Nisga'a use of any fungus for spiritual or ceremonial or technological purposes. It is possible that **t'ukw'a luulak'** (puffball) may have some spiritual connection or stories around it, given its ghostly name.

Technological Use.

An unidentified fungus growing on **giikw** (hemlock) was used in the preparation of dyes[51]. It, or perhaps another fungus, was beaten together with rotted eulachons to make strong long-lasting glue (Boston et al. 1996). The Haida, Tlingit and Tanaina people used various bracket fungi for paint and dyes (Emmons 1991; Kari 1995; Turner 2004a). The Haida had an origin story around a species of bracket fungus (Turner 2004a) and gravestone guardians were carved from *Fomitopsis officinalis* by some Northwest Coastal peoples (Blanchette et al. 1992).

[50] Noted by Compton (1993) as a Nisga'a word.

[51] The color of dye depended upon the technique for preparing it. Yellow dye was made when this fungus was left to decay on the tree, red dye was made by roasting the fungus, black dye was made by burning it. The powders obtained from the fungus were mixed with oil from dried salmon and cedar bark. Urine was used as a mordant to set the colour (Boston et al. 1996).

2.3.4.11 – *seaweed – marine macroalgae*

Hlak̲'askw – black seaweed – *Porphyra abbottiae* V. Krishnamurthy

P'ihl'ooskw – dried seaweed cakes of *Porphyra abbottiae*

Family: Bangiaceae (Bangia family)

Nisg̲a'a word meaning: P'ihl'ooskw is probably an adaptation of a Tsimshian word. The beginning **p'ihl** seems to be an alternate form of the Tsimshian verb **p'ahl** referring to laying down a lining inside something, such as seaweed inside a mold.

Lagii – angel hair – *Chordaria* spp. Family: Chordariaceae (Chordaria family); or possibly red alga – *Gracilaria lemaneiformis* (Bory de Saint-Vincent) Greville and related spp. Family: Gracilariaceae (Gracilaria family).

Word meaning: Nisg̲a'a **lagii** is a borrowing from Tsimshian "**légi**", or "**legi**."

Gyoos – giant kelp – *Macrocystis integrifolia* Family: Lessoniaceae (Lessonia family)

Mok̲ and/or **Aaxwl** – bull kelp – *Nereocystis luetkeana* (Mertens) Postels et Ruprecht Family: Lessoniaceae (Lessonia family)

Nisg̲a'a word meaning: aaxw refers to the rope-like coils of kelp stipe left on the beach by the tide. If the Coast Tsimshian word is "**mo'ox**," it is likely that the Nisg̲a'a equivalent is **mok̲**.

maax̲ts - bladderwrack – *Fucus* spp. Family: Fucaceae (wrack family)

Seaweeds are found near the village of Gingolx, the only Nisg̲a'a village currently along the coast.[52] Six different seaweeds discussed with collaborators have been tentatively identified to genus as noted above. **Hlak̲'askw** is listed as the general term for any edible seaweed (McKay et al. 1986) but today when people discuss **hlak'askw**, they are speaking of the edible *Porphyra abbottaie*[53] which they continue to harvest or trade.

Food Use

> *Here is some Nisg̲a'a magic ... this rock here* [pointing to a rock on the lava beds], *we use it ... we put it on the fire when we are having a feast...we wait until it is red hot and then we pour water on it and*

[52] in the past, there were ,many coastal Nisga'a villages.

[53] *Porphyra* species are the world's most important seaweed foods, and are used worldwide (Turner 2003).

clean it off and then we throw it in a pot with seaweed in it and it just starts boiling. Then when the pot is empty the rocks are covered with seaweed and we eat the seaweed ... it has to be the right rocks, not ones that will break too easy ... the ones from near the river are the ones we use ... it has got to be round with lots of holes in it ... (Sigidimnak̲’ K’igapks – Alice Azak 2008) .

Sigidimnak̲’ K’igapks was likely talking about cooking *Porphyra abbottiae* when she described this preparation. Five collaborators said that in the past, people from the upriver villages went downriver to harvest **hlak̲'askw** (*Porphyra abbottiae*) and dried it into cakes known as **p'ihl'ooskw**. All agreed that dried **hlak̲'askw** harvested in the spring continues to be an important food in many diets and **p'ihl'ooskw** is a highly prized food at many feasts and other celebrations. Two people said it was/is an item of trade between Nisga’a villages and with neighbouring nations (Sigidimnak̲’ K’igapks – Alice Azak 2008; Sigidimnak̲’ Hagwilook̲’am saxwhl giis – Irene Seguin 2009). Today, **hlak̲’askw** is eaten dried or put in soups and stews. Other northwestern peoples harvested, prepared and traded *Porphyra abbottiae* and possibly other *Porphyra* spp. in similar ways (Norton 1981; Emmons 1991; Turner 2003, 2004a; Turner and Thompson 2006).

Two people recalled that a species of kelp, tentatively identified as *Macrocystis integrifolia* (giant kelp), was used to gather herring eggs. One thought that the seaweed was eaten with the eggs, and the other person, who called it **gyoos** wasn’t sure if the seaweed was eaten or whether it just was used to gather the eggs. In other areas of the Northwest, the Tsimshian also used the word **gyoos** to describe a seaweed used to collect herring eggs (Anderson et al. n.d.), but other Tsimshian references say that this term denotes “seaweed covered with spawn” rather than the name of the seaweed (Port Simpson Curriculum Committee 1983; Turner and Thompson 2006). Traditionally the Haida prefer to eat kelp harvested from the protected inner shores of their territory because it is more tender. For trade and commercial purposes, kelp from open offshore areas is harvested because it does not easily rip (Turner 2004a).

Sim’oogit Ni’is Naganuus (Steven Doolan) from Gingolx recalled an unidentified species of seaweed called **lagii** (*Chordaria* spp. and/or *Gracilaria lemaneiformis*):

> *... it's sort of like grass, like hair, long string ... you hook them up from the bottom, where the eulachons and the herring spawn ... it's like angel hair...the white men call it angel hair*[54] (2008).

In the Tsimshian literature, there is a reference to a seaweed called **légi**, described also as a skinny type of seaweed that becomes thickly covered with herring spawn (Anderson et al. nd; Mildred Wilson in Turner and Thompson 2006). Given the similarity of the names, this is likely the same seaweed recalled by Sim'oogit Ni'is Naganuus. It is tentatively identified as *Gracilaria* spp and/or *Chordaria* spp. and is usually eaten along with the herring eggs (Turner and Thompson 2006).

Medicinal use

Four collaborators recalled medicinal uses for some species of seaweed, but they were not certain of the genus or species used. Generally speaking, although various species of seaweed are now known to have medicinal properties (Smit 2004; Teas et al. 2004), detailed information related to its traditional use by Northwest peoples is sparse.

Digestive Disorders: One person said that **hlak'askw** (*Porphyra* spp.) was used to treat constipation but said it had to be eaten in moderation because it could give you diarrhea. The Tlingit also used seaweed to treat disorders related to digestion (Emmons 1991).

Ear, Nose and Throat: One person recalled that her grandmother used seaweed to treat earache. Her grandmother soaked the seaweed, then wrapped it in a cloth and put the cloth on the sore ear, so that the liquid would drip into the ear. The species used for this purpose was tentatively identified as bladderwrack (*Fucus* spp.).

Miscellaneous: One person said that seaweed was used to treat a lot of different conditions, especially when it was green.

Skin Disorders: Two people recalled that some kind of seaweed was used for burns, and one said that the Tsimshian had used it as well. A literature search revealed that the Tsimshian at Hartley Bay used seaweed called "**mo'ox**" (bull kelp - *Nereocystis luetkeana* and *Fucus* spp.) to treat burns. Some people continue to use **mo'ox** for this purpose (Turner 2004a, Turner and Thompson 2006). One person recalled a Nisga'a name, **mok**, for a type of seaweed, but couldn't identify a species or use. Two people

[54] Angel hair is the common name for *Chordaria* spp.

recalled that some kind of seaweed was used to ease the discomfort of bruises; one thought it might be a species of bladderwrack (*Fucus* sp.) while the other thought it might be the same one that was eaten (*Porphyra* sp.). One person thought that *Fucus* sp. or spp. were used to treat canker sores.

Tonic: One person said that seaweed was eaten because it was generally good for you.

Spiritual/Ceremonial Use

No information was reported for a Nisga'a use of seaweed for spiritual or ceremonial purposes nor was there information in the Nisga'a or northwestern literature consulted.

Technological use

One person recalled that a species of kelp, which he called "short kelp" (*Nereocystis luetkeana* – bull kelp) was used to keep salmon fresh and cool when fishing. The Tsimshian and Haida used *Nereocystis luetkeana* for these purposes (Turner 2004a; Turner and Thompson 2006). Nisga'a literature described the use of **aaxwl** (kelp bulbs) for storing eulachon grease (Nisga'a Tribal Council 1995, Vol. I and IV; McKay et al. 2001). The Tsimshian at Hartley Bay used to make fishing lines from the long stems of bull kelp. Helen Clifton recalled that long ago the fronds of this species were used to cover fish in canoes to keep them cool (Turner and Thompson 2006).

One person from Gingolx recalled that her mother used to put seaweed on her garden as a fertilizer and mulch to control weeds. Two people said that the fronds of different species of seaweed were used to collect herring eggs. This use was common amongst Northwest Coastal peoples.

2.3.4.12. Species with Little or No Recorded information

Thirty-three of the species discussed produced little or no information on Nisga'a plant use, although names were sometimes recalled. Several of these species were, however, used by neighbouring or other First Nations for various purposes (Table 2.2).

They are included here (Table 2.2) because they do occur on Nisga'a territory and their use by other First Nations may serve to guide future Nisga'a research.

2.3.4.13. Introduction and Cultivation of Domesticated Food Crops

> *All the elderly people that lived here before – they were really old when they died – every one of them had a garden. In the old days, people would bring plants from all over – from the Skeena River, they came down with a berry bush, and trees and trade for grease for our food* (Sim'oogit Ni'isjoohl – Horace Stevens 2007).

Prior to first contact, northwestern First Nations had long practiced plant cultivation techniques to enhance the diversity and abundance of food available to them (Turner 2001b; Deur and Turner 2005). Three collaborators recalled that the Nisga'a cultivated different plants. One said his grandmother used to divide the rhizomes of **ax̱** (*Dryopteris expansa* – spiny wood fern) and the bulbs of **gasgam ts'im ts'eets'iks** (*Fritillaria camschatcensis* – riceroot) and plant them near her house so she would have easy access to these food plants. Two people recalled that berry bushes, trees and other plants were brought from the wild and cultivated in gardens.

In northwestern North America, in the late 18th century, early explorers introduced western horticultural techniques to facilitate the production of introduced foods. Between 1799 and 1841, the Russian government granted the "right" to the Russian American Company to introduce horticulure and agriculture along the North American coast above 55^{o}N (Dmytryshyn et al. 1988). By 1830, northwestern nations were using potatoes as trade goods (Manson 1832; Ogden 1837; Turner 2004a). The Haida used the sale of potatoes to offset a decline in wealth due to the depletion of fur-bearing animals (Whitford and Craig 1918).

With first contact came the introduction of many new things, including new vegetables, fruits, flour and sugar. While most of the introduced foods are not necessarily less healthy, their introduction, along with other enforced changes, created a dependency and often a preference for the new food (Turner and Turner 2007). In the modern day, the traditional practices of eulachon fishing and the preparation of eulachon grease, salmon fishing and the smoking and drying of salmon) and hunting are widespread among the Nisga'a. However, the harvesting, preparation and consumption of traditional plant foods that had previously sustained people for countless generations has almost disappeared.

Table 2.2. Summary of plant species with no documented Nisga'a use*, but with evidence of use by other First Nations.

Nisga'a name	Meaning	Genus/Species	Authority	Common name	Gitxsan	Tsimshian	Haida	Tlingit	Tahltan	Other
unknown N **snii gantxw** G	Unknown	*Achillea millefolium*	L.	common yarrow	M[17,18,]		F[22] M[22]	M[9]		M[14,15], M[7]
Unknown	Unknown	*Actaea rubra*	(Aiton) Willd	red baneberry						M[14,15]
unknown N. **sninentu** G	Unknown	*Anaphalis margaritacea*	L.	pearly everlasting	S[18]					M,S,[14,15]
unknown N. **leex** G	Unknown	*Apocynum androsaemifolium*	L.	spreading dogbane	T[1]				T[3]	M[21]
unknown N. **hisleekxwit** G	**his**=pretend	*Aruncus dioicus*	(Walter) Fernald	goat's beard				M[13]		M[5,8]
majagalee (general term for flower)	Unknown	*Calypso bulbosa*	L.	fairy slipper			F[22]			M,S[25]
ihlee'em ts'ak	**bleeding nose**	*Castilleja miniata*	Douglas ex Hook	common paintbrush	M[16,17]					
unknown N **hissk'ant'imiýt** G	**his**=pretend **sk'an**=bush	*Chimaphila umbellata*	(L). (W. Bartram	prince's pine	M[4]					M[23,25]
unknown N **hoobixs 'wiiget** G	**hoobix (**spoon of) **Wiiget**"	*Clintonia uniflora*	(Menzies ex Schult. & Schult. f.) Kunth.	Queen's cup	S[1,17]					M[18]
unknown	Unknown	*Comarum palustre*	L.	marsh cinquefoil						F[2]
unknown	Unknown	*Cryptogramma acrostichoides*	R. Br	parsley fern						
unknown	Unknown	*Drosera rotundifolia*	L.	round-leaved sundew			S[22]			M,S[14,15]

Table 2.2. continued.

Nisga'a name	Meaning	Genus/Species	Authority	Common name	Gitxsan	Tsimshian	Haida	Tlingit	Tahltan	Other
k'uukw'alee	sticking to the tail**	*Dryas drummondii*	Richardson ex Hook	yellow mtn. avens					M	
unknown	Unknown	*Empetrum nigrum*	L.	crowberry	F[19]	F[19]		F[20]	F[7,12,20],	M[7,12],
k'uukw'alee	sticking to the tail**	*Galium*	spp.	bedstraw						
unknown	unknown	*Geum macrophyllum*	Willd	large-leaved avens	M[26]	M [22]	M[9]		M[14,15,16]	
unknown N **hagimgasxw** G	unknown	*Lathyrus* spp.	Hook.	creamy peavine	T[1,18]	F[22]			F[12]	
unknown	unknown	*Leucanthemum vulgare*	L.	oxeye daisy					M[14,15],	
unknown N **<u>k</u>'awts' G**	unknown	*Lupinus* spp.		lupine	F[16,17]	F[22]	F[9]		T[12]	
unknown	unknown	*Marchantia polymorpha*	L.	green tongue liverwort					M[6,10,27]	
unknown	unknown	*Menyanthes trifoliata*	L.	buckbean		M[22]			F[11]M[5,24]	
unknown	unknown	*Moneses uniflora*	(L.) A. Gray	one-flowered wintergreen		M[22]			M[12]	
unknown	unknown	*Monotropa uniflora*	L.	Indian pipe					M[25]	
unknown	unknown	*Paxistima myrsinites*	(Pursh) Raf.	falsebox						
unknown N, **ýeen** Ts.	bottom (of boat)	*Potentilla anserina*	L.	silverweed	F,M[26]	F[22]				

Table 2.2 continued.

Nisga'a name	Meaning	Genus/Species	Authority	Common name	Gitxsan	Tsimshian	Haida	Tlingit	Taltan	Other
unknown N **sk'an gapgap** G	sk'an is bush	*Prosartes hookeri*	Torr.	Hooker's fairy bell						
unknown N **hissk'awtsxwit G**	**his**= pretend, **sxwit** carrot	*Prunella vulgaris*	L.	self-heal					M[15,17,18]	
unknown N. **miiganaa'w** G	berries of frog	*Rubus chamaemorus*	L.	cloudberry	F[19]	F[19]	F[9]		F[13]	
unknown	unknown	*Sium suave*	Walter	water parsnip					F[19]	
hlingitkw, hlihlingitkw(pl)	slaves, has word for Tlingit	*Sorbus sitchensis*	M. Roem.	sitka mountain ash	M[17,18],	F[22]			M[12]	
unknown N. **hisgantxwit** G	"**his**" = pretend	*Spiraea douglasii*	Hook.	hardhack	T[1]				T[21]	
gisgits	unknown	*Symphoricarpos albus*	(L.) S.F. Blake	common snowberry		T[22]			M[14,19], [24,25,]	
unknown, **baxbok'** G	bok= blowing with mouth	*Taraxacum officinale*	F.H. Wigg.	dandelion	M[18]F[1]	M[10]			M,F[14,15]	
giikw? N. hlguugan G	branches, brush G	*Tsuga mertensiana*	(Bong.)	mountain hemlock	T[1]		M[13]			

F=Food; M=Medicinal; S=Spiritual; T=Technological; *=Species were discussed with one or more collaborators but no use yet recorded.

Refs:1=Aborginal Edu. Branch nd;2=Ager & Ager 1980;3=Albright 1982;4=Anonymous 1998;5=Bank 1953;6=Beik et al. 2010;7=Veltre et al. 2006;8=Compton 1993; 9=Emmons 1991;10=Glime 2007;11=Heller 1953;12=Kari 1995;13=Krause 1956;14=Moerman 2002;15= Moerman 2009;16 =Smith 1929;17=Smith et al. 1997; 18=Steedman 1930;19=Turner 1995b;20=Turner 1997;21=Turner 2001a;22=Turner 2004a;23=Turner & Bell 1972;24=Turner & Bell 1973;25= Turner et al. 1990;26=Turner & Thompson 2006;27=Wu and Yu 2003. * 1or more collaborators asked about each species; ** pers. comm. Larry Derrick to Jose Coosmans 2011.

The Nisga'a gradually incorporated the horticultural practices and grew new crops in their gardens throughout the Nass, and there were many **anduuyin** (gardens) planted in all villages. Seven collaborators said that their parents and grandparents cultivated various vegetables in gardens.

Sguusiit – potato – *Solanum tuberosum* L.

Word meaning: This word is very widespread along the coast and probably comes from a Salishan word from around Victoria, meaning a kind of local edible tuber, which was also applied to potatoes when they became available (they were first grown at Fort Victoria, among Salishan-speaking people).

One of the most frequently mentioned crops was potatoes, known as **sguusiit**. Because the term is widely used by many other coastal nations as well, some suggest that it originates from Chinook jargon[55] and translates to "good seed" (Turner 1995b). An alternative explanation for the origin of the word is suggested by Dr. Marie –Lucie Tarpent:

> *... potatoes were sold mostly as food, not as "seed," and the initial s-sound is unexplainable if that is the origin. It seems more likely that English-speaking traders were not able to say the Salishan[56] word properly but pronounced it "sgooseet," which local people in other areas thought was the English name, and, after learning English they may have reinterpreted the supposedly English word as "good seed"* (Tarpent 2011).

One collaborator recalled that as a girl she would help harvest potatoes in Old Aiyansh (**Gitlax̱t'aamiks**) and another said that people returned from work at the cannery to help harvest potatoes.

Other cultivated groups included turnips (*Brassica rapa* ssp. *rapa* L. or *B. napobrassica* (L.) Mill.), carrots (*Daucus carota* ssp. *sativus* (Hoffm.) Arcang.),

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[55] Chinook jargon originated as a trade language in the Pacific Northwest in the 19th century. It is related to, but not the same as, the aboriginal language of the Chinook people along the Columbia River of Oregon and Washington, upon which much of its vocabulary is based.

[56] Examples of words for potato in Salishan languages include: Lil'wat **sqawts**, Halqemeylem, **sqáwth,** Halkomelem, Nooksask - **skä'us** (Suttles 1951**).**

domesticated berries and other fruits such as apples (*Malus domestica* Borkh.) and cherries (*Prunus avium* L.). Garden produce was usually stored for winter in root cellars or bins. Today, large gardens have mostly disappeared and residents of the Nass Valley primarily depend on buying fruits and vegetables from supermarkets in Terrace. Some villages have community gardens (or unutilized space for them) and some people have private gardens in their back yards.

Table 2.3 lists some commonly introduced foods that have been incorporated into traditional diets. Some were given names by the Nisga'a that are different from their English names, but most were just referred to by their English name. Foods that are not garden produce are included in the table to support the discussion on change in diet and lifestyle that has occurred since first contact. The fact that these foods were incorporated into the Nisga'a language indicates that they were important in the culture when Nisga'a was still widely spoken.

Table 2.3. Some foods introduced to the Nisga'a since European contact.

English name	Nisga'a name	Translation
potato*	**sguusiit**	adaptation of Salish for tuber (Tarpent pers.comm. 2011)
rhubarb*	**tl'ok'ats**	adaptation of the Tlingit word **tl'aaq'wátch** for a kind of dock or sorrel* (Tarpent 2011)
turnip*	**inuu**	"to have no hair," probably a borrowing from Haida (Jordan Lachler to M-L Tarpent 2011).
carrots*	**kaloots**	from English word [57]
garden	**anduuyin**	
rice	**gask**	"to be bitter" from **gasgam ts'im ts'eets'iks**, word for rice root; similar in appearance to rice
flour	**mitgum anaax**	**mitga** means to scatter, **anaax** is bread
salt	**mo'on**	Unknown
sugar	**sugwat**	from English word
bread	**anaax**	Unknown
bread crumbs	**gamx'anaax**	**gam** – anything used for left-overs
cake, pie	**paay**	from English word for pie
upside down cake	**paayim anhlaxw**	from English word
beef	**smaya mismuus**	English root for moose, **smax** is meat

*indicates food that was typically grown in gardens in the Nass Valley. Unless otherwise noted translation is from McKay et al. 2001.

[57] Nisga'a words do not normally start with plain *k* (they would have either *k'* or *g*), the word **kaloots** is an exception because it comes from English *carrots* (Tarpent pers. comm. 2011).

2.4. Discussion

Around the world, plants have sustained people for thousands of years for food and medicine to keep them healthy (Wilken 1971; Brothwell 1998; Bergman et al. 2004) for making tools, shelter and clothing which allowed them to comfortably survive in their environment (Turner 2001) and for spiritual and ceremonial purposes that defined cultures and sustained souls (Voeks 1990; Nisga'a Tribal Council 1995, Vols. I and II; Acharya 2003).

The archival and literature searches were a good starting point for this work and provided a substantial amount of general information related to plant knowledge of Northwest Coastal peoples and by First Nations in general. However, information related specifically to the Nisga'a use of plants was not as prolific. There likely exists more written information related to traditional Nisga'a plant knowledge, particularly the use of plants for medicinal, technological and spiritual purposes. Stories belonging to particular **pdeeks** as well as private journals, scrapbooks, letters and tapes belonging to individual families could provide additional information on the uses presented here.

It is clear from this research that the traditional use of plants was an important aspect of Nisga'a culture. All of the collaborators recalled specific plant species and their uses, if not by sight then by name. Every person remembered their parents or grandparents using plants in some way and teaching them about the use, care and respect for plants and all living things. Since first contact with European culture, the oral tradition of passing down knowledge related to the traditional use of plants has declined. It was gradually replaced by western foods, medicines, traditions and lifestyles. Nonetheless, there are many Nisga'a who recall seeing or being told about a specific plant and how it was used; they know the importance of plants in Nisga'a culture.

Generally speaking the Nisga'a harvested, prepared and stored the foods available to them in ways similar to those of other northwest coastal peoples. However knowledge of medicinal preparations was often exclusively held by a Nisga'a specialist who prepared medicines for Nisga'a, as well as for people from other Nations, without disclosing the ingredients or preparation process. When such information was shared, it was expected that ownership of the knowledge would be respected and would not be shared further without permission from the knowledge holder (Sim'oogit Hayḿaas – Chester Moore 2008).

2.5. Conclusion

This research into the traditional use of plants by the Nisg̲a'a is not complete. As one person said, "it is good that this work is being done, but it should have been done fifty years ago." If the work had been done fifty years ago, certainly more information would have been recalled and the information would be more complete. More detail is needed, especially with respect to the way foods and medicines were prepared, and how medicine was used and administered.

Information with respect to traditional plant knowledge was not collected for all species discussed. In some cases collaborators preferred not to share information about a particular species, or they could not recall a use. As the research progressed and as people became familiar and comfortable with the goals of the research, if a collaborator could not recall a specific plant or its uses, they would suggest asking someone else who might know more and who would be willing to share their knowledge. The concept of sharing knowledge for the good of the community remains an important part of the culture.

Sadly, since this work began, four collaborators have passed on: Sim'oogit Gadim G̲aldoo'o (Charles Alexander), Sim'oogit Bayt Ńeek̲hl (Jacob Mckay),Sigidimnak̲' Ax̲dii Ksiiskw (Grace Nelson) and Sigidimnak̲' Kwhligyoo (Lavinia Azak). Much valuable information not yet recorded from them was lost. Nonetheless, the compilation of traditional plant use presented here provides a good start in documenting Nisg̲a'a plant knowledge. Hopefully it will provide guidance and inspiration for further research with respect to traditional Nisg̲a'a plant knowledge.

While people were generally very willing to share their knowledge with a middle-aged **k̲'amksiiwaa** (white person), there is more information that would more willingly and rightfully be shared between Nisg̲a'a. Hopefully, the information presented on 149 species will inspire Nisg̲a'a, young and old, to share and record more information related to their traditional use of plants as well as other aspects of their rich cultural traditions in order to preserve it for future generations.

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Chapter 3

Nisga'a Botany and Plant Classification

> *In the old days we named plants for lots of different things, for how they looked, for where you could find them, for how they tasted ... how we used them. ... We also called places different things, sometimes about plants or other things like fish. My grandfather had a place called **Ank'idaa** and that was because of a hook for eulachons called a **k'idaa** or **ank'idaa** made from bones. But now most people call them by their English name. ... The next generation, the younger people use the English names mostly. Now they're trying to learn the Nisga'a names again. Lots of times people phone me and ask how you say something and I tell them.* (Sim'oogit Gadim Galdoo'o – Charles Alexander, Oct. 2007).

> *As we lived alongside the river and our lives revolved around the river, a lot of our words, especially directions, refer to the river* (Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin pers. comm. 2012).

3.1. Introduction

Documenting Nisga'a plant knowledge reveals that plant nomenclature and uses are deeply intertwined with their language, culture and world view. An exploration of plant classification, taxonomy, botanical knowledge and ecological concepts illustrates important features of the Nisga'a environmental philosophy. For example although the Nisga'a do not have a separate term for plants (referring collectively to trees, shrubs, herbs, and mosses), other aspects of their language and culture imply the recognition of plants as living things. People thank or talk to a plant before harvesting (Sim'oogit Gadim Galdoo'o -- Charles Alexander 2008; Sigidimnak' K'igapks – Alice Azak 2008). Parts of some plants (e.g., bark of **wa'ums** or roots of **ts'iks**) are used in ceremonies before hunting, before sporting events or in homes, because it is believed that the spirit of the plant will bring them luck (see Chapter 2). This chapter describes some the cultural implications of Nisga'a plant classification and terminology, and explores its relationship to western systems.

3.1.1. *Early Botany*

All cultures have an implicit understanding of the plants in their environment. The earliest written records in Western culture on the study of plants date from the 4th century BCE (before the Christian era) when Greek scholars Aristotle and Theophrastus (often now called the "Father of Botany") began to record a systematic study of plants. They are credited with first documenting the widespread division of the plant world into the three categories of "trees," "shrubs" and "herbs" (Von Sachs 1890). The English term "botany" or "the science which treats of plants" or "a systematic study of plant life," has been used at least since 1696 (Little et al. 1988). However, plants were obviously of interest to everyday people and scholars long before the term was first used. Indeed, plants have been used by people for more than 10,000 years when hunter/gatherer cultures around the world harvested them, throughout the so-called Neolithic Revolution 10,000 to 7000 years ago BP (before present), and continues to this day (Von Sachs 1890; Prescott-Allen and Prescott-Allen 1990; Gupta 2004).

Before the printed word, indigenous peoples systematically developed detailed knowledge about the plant species growing in their environment and their potential for use or harm. This knowledge was passed down orally through the generations in order to document and preserve it. Although the word "botany" is an English term used to describe western concepts of plant study, it is used in this chapter to describe the Nisga'a characterization of plant life because their detailed traditional plant knowledge demonstrates a systematic study of the plant world.

3.2. Nisga'a Botany in a Cultural Context

The Nisga'a use of plants is often woven into their **adaawa<u>k</u>** (oral histories) which recount important events in their history. Some important plants such as **wa'ums** (*Oplopanax horridus* – devil's club) have **adaawa<u>k</u>** of their own (Nisga'a Tribal Council 1995, Vols. I-IV). Their long history of plant use provided the Nisga'a with a systematic framework to identify, classify and name plants. This knowledge was essential to survival, ensuring that the right species would be harvested for its intended use. Such knowledge allowed the identification of berries suitable for human consumption, plants that stored well to provide food for winter, plants for medicine, and plants used for a variety of technological purposes from canoes and houses to game pieces for leisure activities and toys for children.

Nisga'a plant names are based on a variety of plant features such as appearance, odour, habitat or use. For example, the species that botanists call *Aquilegia formosa* (or red columbine in English) is known as **ihlee'em ts'ak** ("bleeding nose") in Nisga'a because the flower has the colour and shape of a bloody nose. **Gasgam ts'im ts'eets'iksk** (*Fritillaria camschatcensis* -- riceroot), which translates to "bitter, from the ground," is so named because the white rootlets which resemble rice can be bitter if picked too late in the season and they grow underground (Sigidimnak' Axdii Ksiiskw -- Grace Nelson 2008; Tarpent 2011). **Ts'anksa gaak** (*Allium cernuum* – nodding onion), on the other hand, translates to "armpit of raven," presumably because of a strong odour (Tarpent 2011).

3.2.1. *Folk Taxonomy*

In order to understand Nisga'a plant classification and naming, a discussion on the general concepts of folk taxonomy is necessary. Generally speaking, folk taxonomy is defined as a local alternative form of biological classification used by people to describe, name and organize their natural surroundings. Folk taxonomic research encompasses three areas: the study of the physical characteristics of the organisms assigned to any particular group, the principles by which organisms are naturally organized in people's minds, and the study of linguistic principles involved in naming those organisms and organism groups (Berlin 1973). Research with respect to the level of detail encompassed in folk taxonomic systems often compares folk taxonomies with the hierarchical taxonomic system as standardized in western science by Linnaeus in 1758 (Berlin et al. 1968, 1974; Berlin 1973; Hunn 1982; Hunn and French 1984; Atran 1998).

The widely accepted scientific plant taxonomic system is based on a series of six[1] nested, ranked taxonomic categories assigned to groups of organisms[2]. Finer sub-categories are included within or subsumed by levels above. The system attempts to reflect evolutionary relationships, based on morphology and anatomy with an emphasis on reproductive strategies, which tend to be less modified by environmental conditions than vegetative features (Cronquist 1988). The underlying principles on which folk taxonomies are based are described by some researchers as being universally similar and based, like scientific taxa, on plant morphology (Lévi-Strauss 1966; Berlin et al. 1968; Berlin 1973; Brown 1984; Berlin 1992). Others suggest that while folk taxonomies may have universal similarities, they reflect culturally defined differences determined by the environment and social and cultural adaptability (Hunn 1982; Turner 1974, 1987, 1989; Nazarea 1999). Generally, researchers have concluded that folk biological classifications or folk taxonomies around the world are similar in terms of their hierarchical structure (Berlin et al. 1974; Atran 1998).

Discussion of why and how people classify plants (and animals) as they do has been a subject of scholarly debate among researchers for over four decades (Berlin et al. 1968, 1974; Berlin 1973, 1986, 1992; Turner 1974, 1987, 1989; Hunn 1982; Brown 1984, 1986). Conklin (1954) triggered the debate as a result of his work with the Hanunó'o people of the Philippines, in which he challenged the dominant western academic view that indigenous peoples managing their resources in tropical climates had a primitive relationship to their land. His work inspired other academics and generated interest in the way indigenous cultures view their land. Important research was subsequently undertaken to cross-reference the classification systems of native and western cultures (Berlin 1973; 1992; Berlin et al. 1974, Turner 1974, 1987, 1989; Hunn 1982; Hunn and French 1984; Brown 1984; Ellen 1993 and others). These systematic studies represent a leap forward from the view that indigenous knowledge was simplistic and rudimentary. Some researchers believed that classification systems were universally driven by the intellectual desire to bring order when confronted with chaos (Lévi-Strauss

[1] The principal plant taxa (levels or categories) are Division, Class, Order, Family, Genus, and Species (Ray et al. 1983).
[2] The same structure, though with some different names, is applied to plants, animals, fungi, microbes and the entire tree of life (see http://www.tolweb.org/tree/).

1966) or “chunks of biological diversity” (Berlin et al. 1974). Others thought that classifications were based primarily on utilitarian concerns and needs (Turner 1974; Hunn 1982; Ellen 1993). Nazarea (1999) acknowledged that the debates with respect to the why and how of folk taxonomy have been very worthwhile. She concluded that humans probably operate and classify their surrounding in ways common to humanity but based on culturally specific conditions and needs, and that it is now time for research to move forward and address other concerns (Nazarea 1999).

The general categories of a folk taxonomic system, described by Berlin et al. (1968) and expanded upon by others, are based on ethnobiological ranks; each biological class belongs to one of five particular ranks as shown in Table 3.1.

Table 3.1. Folk taxonomic ethnobiological ranks.

Rank*	Nisga’a Example	English Example
Unique Beginner	unnamed	plant
Life-form	gan	tree
Generic	simgan (cedar tree)	pine tree
Specific	none	lodgepole pine
Varietal	none	shore pine

*from Berlin 1973, Berlin et al. 1974, Brown 1986.

3.3. Nisga’a Plant Taxonomy and Terminology

Nisga’a plant classification generally represents a hierarchical folk taxonomic system similar to the system described above (Table 3.1). The level of detail in their classification of plants is similar to the classification practices of other Northwestern North American peoples (Turner 1974; Compton 1993; Johnson 1999).

Nisga’a plant classification implies the mental concept of “plant” as the unique beginner. In the past, there was not a general word for the domain of “plant” but plants are included in the concept of living entities. However, the word **ýans,** which traditionally meant “leaf or “leaves,” is now recognized by some as a general term for “plant,” excluding seaweeds and mushrooms (Sigidimnak̲’ Ts'aa Gabin -- Verna Williams pers. comm.).

Within the overarching rank of unique beginner are taxa at the rank of life-form. It was possible to positively identify six Nisga'a plant or fungal life-forms, including **gan** (tree), **hlguugan** or **sk'an** (shrubs, including some non-woody berry-producing plants[3]), **hap'iskw** (grass-like plants), **bilak** (moss and lichens), **damtx** (ferns), and **gayda ts'uuts'** (mushrooms and other fungi) and three life-forms tentatively (Figure 3.1).

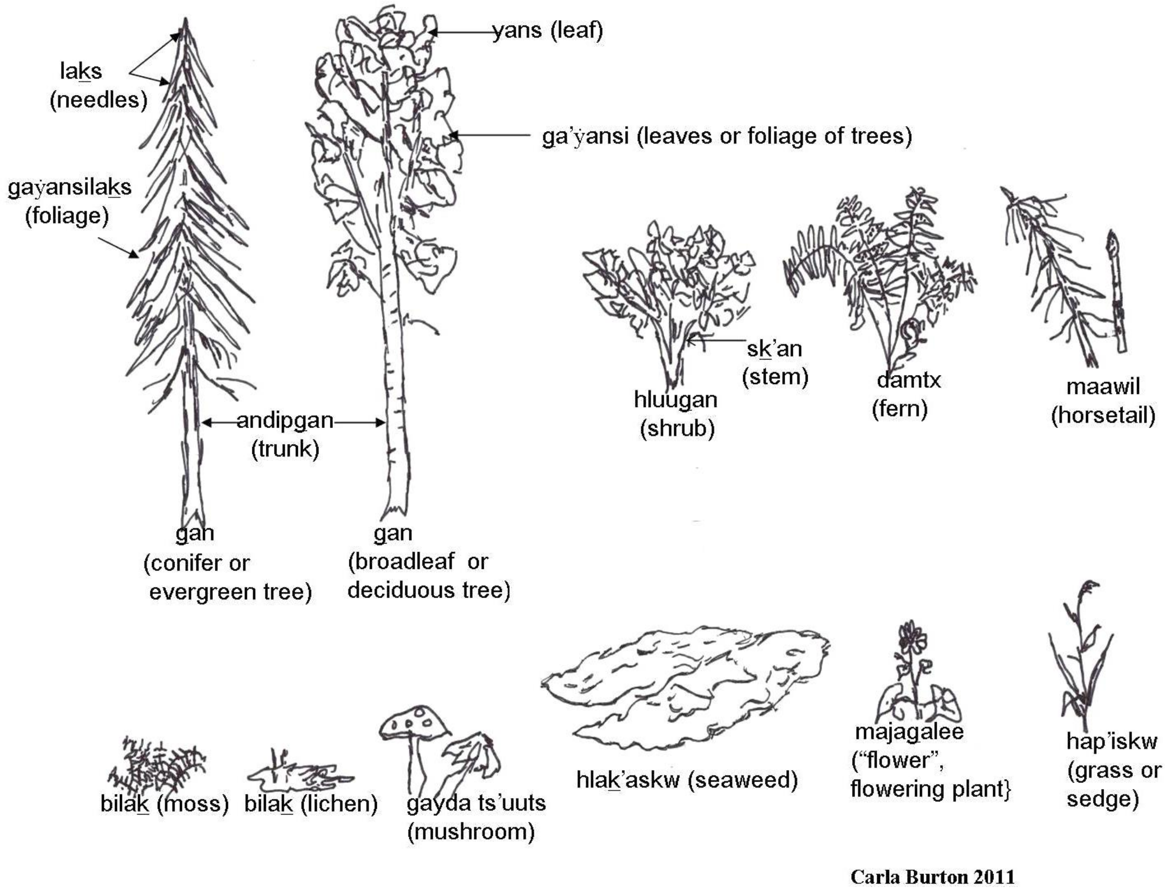

Figure 3.1. Nisga'a terms for plant life-forms.

Nisga'a life-form categories are evidently based mainly on external appearance or morphology. For example, **gan** (tree) or **gangan** (trees) denote big plants with green **ýans** (leaves) or **laks** (needles) with **andipgan** (a big woody trunk) and various other features portrayed in Figure 3.2.

[3] Examples of herbaceous species with strong supporting stems include **k'ots** (*Maianthemum racemosa* – false Solomon's seal) and haḿook (*Heracleum maximum* – cow parsnip, formerly known as *Heracleum lanatum*).

There are two terms noted for shrub, **hlguugan** and **sk’an**. **Hlguugan**, which translates to ‘small tree,’ is a general term for a shrub “out of season” when its specific characteristics (leaves, berries) are not obvious. **Sk'an** also means shrub but has come to refer to more things than just shrub. Currently, many people use **sk'an** as a prefix to denote berry-producing shrubs or small trees but **sk'an** has a much wider application. The common meaning of **sk’an** is 'support.' Although frequently used to refer to berry producing species, the term **sk’an** can also refer to plants that do not produce berries (e.g., **sk'anmaawil(x)** is *Equisetum* – horsetail) or to berry-producing species that are not shrubs (e.g., **sk’an miigunt**, which is *Fragaria virginiana* – wild strawberry). To substantiate its meaning as a term for ‘support,’ **sk’an** is also used as a prefix to create words for introduced things in which the support is a pole-like object (e.g., **sk'anhahlo'o**[4] 'mast' and **sk'anlaakws**[5] 'street light or lamp' (Sigidimnak’ Ẃii Ts’iksna’aks – Pauline Grandison 2008; Sigidimnak’ K’igapks – Alice Azak pers. comm. 2010; Tarpent pers. comm. 2012).

The identification of **hlak’askw** (seaweed), **maawil** (horsetail) and **majagalee** (flowering plants) as life-forms is tentative. Some collaborators recalled and Nisga’a literature notes that **hlak’askw** is the word restricted to edible seaweed, while others said it describes seaweed in general as well as the word for *Porphyra* specifically. Similarly, some collaborators thought that any horsetail with the rough stem typical of horsetails (*Equisetum* sp.) was **maawil**, while others recalled that the term referred only to the species used for sandpaper (*Equisetum hyemale*). Finally, **majagalee** is considered by some as a category for all herbaceous flowering plants as well as the common term any “flower,” while others thought that **majagalee** was just a general term for pretty coloured flower (much like “wildflower” in English). Grasses, mosses, lichens, mushrooms, seaweed, and horsetail are recognized as separate life-forms in that each has a common or general term that encompasses all species within that particular life-form but few or no named species. These have been referred to as “empty taxa” (Turner 1974).

[4] **hahlo’o** translates to ‘sail’ (Tarpent pers. comm. 2012)
[5] **laakws** translates to 'lamp,' probably originally 'torch' (Tarpent pers. comm. 2012)

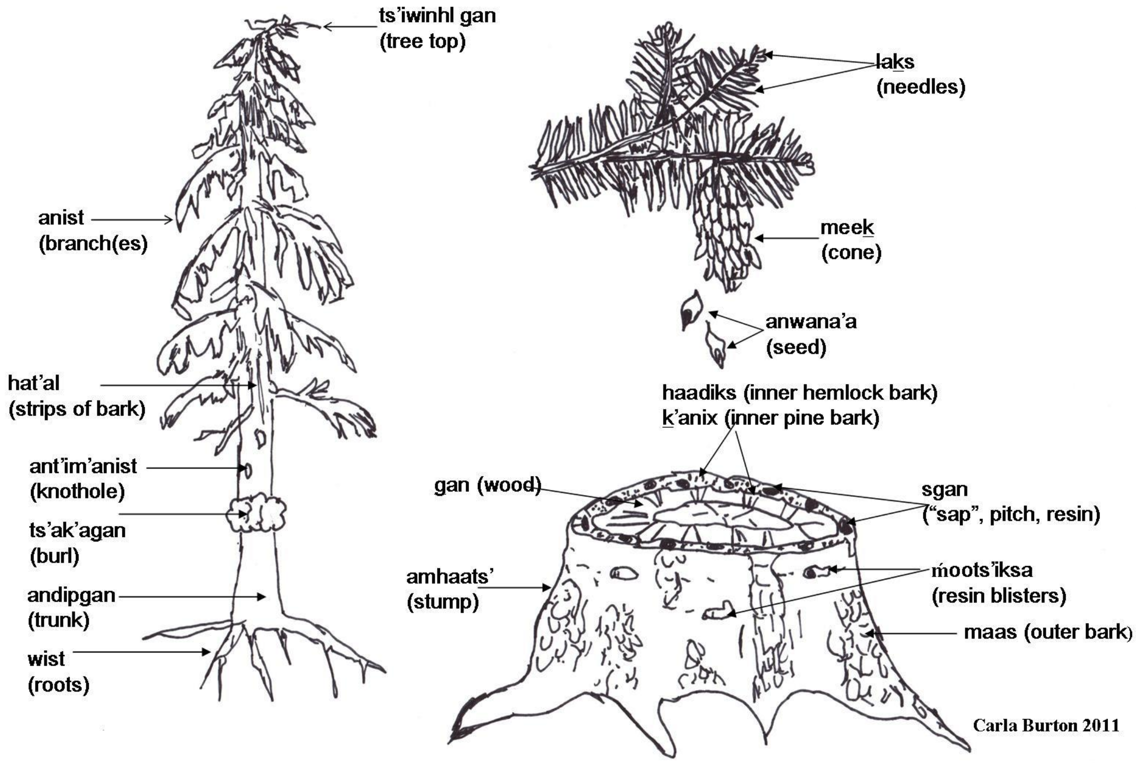

Figure 3.2. Nisga'a terms for parts of a tree. Some terms are particular to specific tree species only, e.g., **hat'al** refers to strips of cedar bark only.

Nisga'a recognition of taxa that fit into Berlin's categories of "specific" and "varietal" was difficult to confirm. As in common English usage, collaborators recalled three different tree species that they referred to as fir trees: *Abies lasiocarpa* (subalpine fir), *Abies amabilis* (amabilis fir -- **alda** and **ho'oks**) and *Pseudotsuga menziesii* (Douglas-fir -- **alda**). However, the name given to each species was not consistent. Some people did recognize the difference between the two *Abies* species, and some did not. It is also worth noting that throughout the region, native and non-native people typically refer to all *Abies* species as "balsam," presumably reflecting their similarity to the eastern balsam fir, *Abies balsamea*. Some people said there was no Douglas-fir growing on the territory while others said that it could be found and called it **alda**, the same name given for one or other of the *Abies* species. Similarly, only a few people knew of the existence of both *Tsuga heterophylla* (western hemlock) and *Tsuga mertensiana* (mountain hemlock) on their territory, and if they were familiar with both trees, thought they were both called **giikw** or couldn't recall the name for mountain hemlock. On the other hand, two terms do exist for what in English are loosely referred to as "cedar" trees (both members of the Cupressaceae family), which the Nisga'a appropriately name with strongly different terms **-- simgan** for *Thuja plicata* (western redcedar) and **sgwinee'ee** for *Chamaecyparis nootkatensis* (yellow cedar).

Nisga'a terms for several features of plant anatomy and morphology were also identified (Figure 3.3). These include **wist** (roots), **sk'an** (stem), **ýans** (leaf or leaves), **binaak** (thorns or prickles) and **xheek** (blossom).

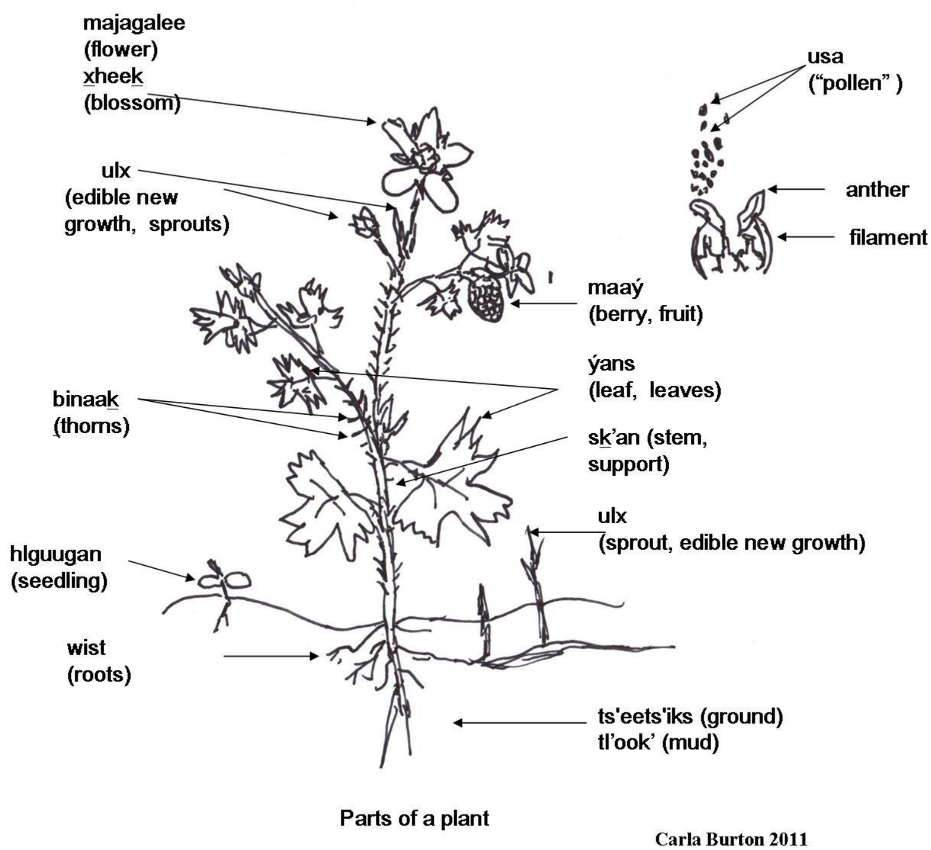

Figure 3.3. Labelled parts of a generic plant.

The term "**usa**" for pollen is only tentative; it is taken from the term **usa ẃaasan** for willow (**ẃaasan**) catkin (**usa**). Its use is based on one person's belief that "**usa"** was the word for pollen as well as catkin, since catkins contain pollen. Similarly the use of the word **ulx** as a general term for "sprout or edible new growth" is tentative. People who knew the term **ulx** thought it referred to edible thimbleberry (*Rubus parviflorus*) and salmonberry (*R. spectabilis*) sprouts that they used to eat early in the spring. However, two people suggested that the term referred to any edible new growth eaten in the spring and that “in the old days” people would eat any new sprout that they knew was edible.

3.4. Nisg̲a’a Place Names, Terrestrial Ecology and Resource Management

Literature and Nisg̲a’a terminology suggest that a dimension of Nisg̲a’a botany extends to their understanding of vegetation, ecosystems and their management. Terrestrial ecosystems are described in western ecology on the basis of dominant plant species, and often the climate or terrain in which such communities are found (Meidinger and Pojar 1991; Barbour et al. 1999). Nisg̲a’a descriptions of plant communities often imply a much closer connection to the land. Their system for describing their land is based primarily on topography (physical features) such as **biyaak̲hal** (cliff), **bax̲-hahlhitkw** (steep slope), **dil** (hill), and **sganist** (mountain). Many of their terms are similar to those of the Gitxsan Nations (Johnson 2000).

K̲’alii-aksim Lisims (Nass River) and other bodies of water play an important part in locating and describing the land and movement across the land. The words for the directions “north” (**gigeenix**) and “south” (**geets'**) are the same as terms for upriver and downriver. When a person says “I am going **geets’**”, this means they are going downriver and not going **gigeenix**[6] (upriver). The term **jaga** is used when describing movement from water towards shore so when it is used in relation to water, you know that the person using it is on the water. **Ukws** is used to describe movement from the shore to the sea (Sigidimnak̲’ Hagwilook̲’am saxwhl giis – Irene Seguin pers. comm. 2012).

In general, First Nations place names imply a long and close connection to their land. Johnson (2000, p. 321) characterized the First Nations concept of place names as a “sensitive index to the long-term relationship of people to their land base that reveals information about ecology, cosmology and history.” In the Nisg̲a’a world view, the

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[6] **K̲’alii** also means upriver, but it refers to moving upriver as in **Dim k’alii-saskw n̓idiit** (we are going upriver) while **gisi** means moving downriver (Sigidimnak̲’ Hagwilook̲’am saxwhl giis – Irene Seguin pers. comm. 2012; First Voices, available at www.firstvoices.com).

concepts of land, land management, resources, and place names are not considered separate entities but part of an intricate web that links language and culture to the land (Nisga'a Tribal Council 1995, Vol. IV). Nisga'a place names often describe physical features, resources areas, or historical events as well as places described or named in their origin stories. For example, **ansimaaý** translates to "place to pick berries," **Ksi Sgasginist** to "coming out of lodgepole pine," **Lax Bilak** to "place of moss," **Ksi Gwinhat'al** to "coming out of cedar bark" (Nisga'a Tribal Council 1995, Vol. IV; Nisga'a Final Agreement 2001, Appendix F). Through the course of this research a number of other place names were revealed that depicted dominant or distinctive vegetation, or key resource gathering areas. Different bodies of water are often used to define boundaries between territories (McNeary 1976). However, since place names are considered sensitive information by many Nisga'a and permission was not granted to share them here, they are not discussed in detail.

3.4.1. *Nisga'a Ecological Zones*

Nisga'a traditional territory is vast and complex with many different ecological zones, which vary both longitudinally and altitudinally, with discrete low-elevation and high-elevation zones under coastal (maritime) and interior (more continental) climates (McNeary 1976; Banner et al. 1993). Within the Nisga'a language, different terms exist to describe these different zones (Table 3.2). With respect to altitude, there are areas of low elevation, mid-elevation, subalpine and alpine. Terms used to denote specific geographic areas implicitly reflect various conceptual systems for classifying them. For example, distance from the coast to the interior of the territory is recognized by terms for "downriver" and "upriver." It was understood that some animals and plants were more common along the coast or upriver, and some were found only at low elevations. Some animals such as **matx** (goats) were known to be only found in the alpine zones, while **ul** (black bear) and **likińskw** (grizzly bears) were known to move from upper to lower elevations dependent on the season. Similarly, some species are found primarily on the coast (e.g., **sgwinee'e –** yellow cedar) or in swamps (e.g., **tiim laxlax'u** – Labrador tea**)**. Different berry species are found exclusively in one kind of habitat (e.g., **wii pdalks --**

bog cranberry), or were known to be more abundant at one elevation over another (e.g., **simmaaý –** black huckleberry).

Because of the complex nature of their territory, Nisga’a management of natural resources is a complex and regulated system embodied in their language. The language contains many different terms for areas of specific vegetation, habitat types, landscape features, resources and resource management areas (Table 3.2) (Tarpent 1989; Nisga’a Tribal Council 1995, Vol. IV).

Table 3.2. Nisga’a terms related to ecosystems, natural disturbances and resource management (listed alphabetically within sections).

Plant Communities or Ecosystem Types		Resources and Land Management Terms	
Nisga'a Word	**English Word**	**Nisga'a Word**	**English Word**
aks	water	**aldim haywis**	earthworms
ansimaaý	place to pick berries	**aliyint**	ripe
ansimiigunt	place to pick strawberries	**amhaats'**	uprooted tree stump
ant'aahlkw	place to gather plants for food & medicine; berry picking place	**andilgan**	beaver dam
ango'oskw	hunting & fishing place	**andipgan**	trunk of tree
bax̲-hahlhitkw	steep slope	**anduuyin**	garden
biyaak̲hl	cliff	**anwana'a**	seed
dil	hill	**anwana'am hapiskw**	grass seeds
gapks	elevation	**gangan**	a stand of trees
gilix	hill (up on a)	**galdoo’o**	forest
k̲’alii-aks	river	**geelukws**	riptide
lax̲-amaakws,	meadow	**goobiỳaak̲**	tidal wave
likst'aa	island	**gwaatl'ax̲**	snail or slug
luux̲ts'agimks	shade	**gwanks**	well/spring of water
miin	foot or bottom of hill	**ha'am wil**	resources
naa ýee	clearing	**hanks**	shallow water
sdax̲-ḿukws	snow on one side of a tree	**hayx̲kw**	decaying wood
sgańist	mountain	**ksi-ỳanskw**	to weed
sýoon	glacier	**lakw**	firewood
tk̲'ayks	close to the ground	**ḿas**	to grow
ts'ilaaskw	canyon	**saa-mihl**	to get burned off
ts'im-t'in	valley (in the)	**sukws**	driftwood
ts'iẃin	top, tip (of a thing)	**t'aagan**	lumber, planks
x̲hlip	tip (at the)	**t'ahl**	a patch of berries
wisax	sandbar	**wan** (trans.) **wand'a** (intrans.)	to plant ...
ỳaga	slope	**wok̲'**	to dig a hole

Table 3.2. continued.

Plant Communities or Ecosystem Types		Resources and Land Management Terms	
Nisga'a Word	**English Word**	**Nisga'a Word**	**English Word**
Terms for Water		**Disturbance Terms**	
k̲’alii-aks	river	**lax̲-mihl**	lava beds
t’ax̲	lake	**malkw**	to burn something
lax̲lax̲'u	swamp	**miý een**	smoke
lax̲-mo'on	shallow ocean	**muks'ilkskw**	full of sediment
lax̲siilda	deep ocean	**pdaal**	to flood
lax̲ ts'eehl aks	beach, edge of water	**yak**	earthquake
lox̲	reef	**sańakwa**	tent caterpillar
magoon	headwaters	**t’uxwt’agum ba’askw**	twister, tornado
pdalks	high tide	**t'ax̲ t'ag̲ amx̲kw**	mist
saxw	mouth of river, estuary	**wil ksi-bax̲hl mihl**	volcano
t'aamiks	pond		
t'is	high tide		
ts'aḿiks	bay		
ukws	out towards the sea		

Sources: McKay et al. 1986; McKay et al. 2001; Williams 2006; First Voices at http://www.firstvoices.com/en/Nisgaa.

3.4.2. *Seasonal Rounds*

The Nisga’a year is based on 13 lunar cycles now divided into twelve months (Table 3.3). The first month of the Nisga’a year is **Buxklak̲s** (equivalent in the Gregorian calendar to February). **Buxklak̲s** marks the traditional celebration of **Hoobiyee** when the winter food supplies are almost gone and the Nisga’a are hoping for a bountiful year and preparing for the run of eulachons. The harvesting of eulachons marks the beginning of the seasonal round (Sigidimnak̲’ Ksim Sook -- Nita Morven 2012). The oily little fish arrives when the supply of winter food is low. At this time emerging fresh green leaves of **t’ipyees** (*Sedum divergens* – lava berries) are also harvested. In the past, other greens such as **t’uuna’akw** (*Typha latifolia* – cattail) were also harvested.

The name for each month highlights something that was traditionally important in the Nisga’a culture (Table 3.2). The names demonstrate the intimate understanding and connection of the Nisga’a to their natural environment and its resources.

Table 3.3. Nisga'a months of the year.

Nisga'a Name	Meaning	English Name
Buxwlak̲s	conifer needles scattering	February
X̲saak	to eat oolichans	March
Mḿaal	canoes (now that the river is free of ice)	April
Ỳansa'alt	in full leaf	May
Miso'o	sockeye salmon	June
X̲maaỳ	to eat berries	July
Ẃiihoon	big fish, plenty of fish	August
Genuugwiikw	trail of the groundhog/marmot	September
X̲laaxw	to eat trout	October
Gwilatkw	blanketing of new snow	November
Luut'a	staying in (refers to the place of sunrise staying the same for several days)	December
K̲'aliiyee	going upriver (refers to the place of sunrise)	January

McKay et al. 1986

Mḿaal translates to "canoe" and was so called because it was the time of year when the river was free of ice and travel by canoe could once again be the main mode of transportation. **Ýansa'alt** translates to "in full leaf" and marks the time of year when plants are growing quickly to full leaf. The harvesting of plants began in earnest then and continued right through the summer. **X̲maaỳ** (time to eat berries) marks the importance of harvesting plants for food, especially berries. Today many people still look forward to **X̲maaỳ**. **Genuugwiikw** marked the beginning of the hunting season when the men traditionally headed up into the alpine to hunt **gwiikw** (ground hog or marmot) and **matx** (mountain goats) At that time, women often went to **ant'aahlkw** (berry grounds) in the mountains to harvest high-altitude berries like **simmaaý** (*Vaccinium membranaceum* -- black huckleberry). When berry harvesting was complete, the men undertoook the burning of berry patches to increase berry production (McNeary 1976).

3.5. Discussion

In the modern day, the western system of classification predominates in both the professional Nisga'a working environment, as well as in everyday life. This use has developed over time since western lifestyle and language became dominant in the

Nisga'a culture. As people became part of the wage economy and western lifestyle, English became the primary language learned and spoken. Consequently, there was a loss of knowledge with respect to Nisga'a plant names and plant classification (as well as many other aspects of Nisga'a culture). Nonetheless, it is evident from the detailed descriptions of plant parts (Figure 3.1., 3.2., 3.3), geographical terms and plant names retrieved through collaboration with the Nisga'a (Figure 3.1., 3.2, and 3.3; McKay et al. 1986; McKay et al. 2001; Nisga'a Tribal Council 1995, Vol. IV; Sigidimnak' K'igapks – Alice Azak 2008; Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2008) that knowledge of Nisga'a botany is once again becoming an important part of Nisga'a culture.

In modern Nisga'a classrooms, students of all ages are learning Nisga'a plant classification (as well as other cultural traditions) in language, science and history classes and other areas of the curriculum. The teaching is a blend of traditional and non-traditional methods, as elders regularly work in classrooms alongside the classroom teacher. They also accompany students on field trips and excursions where different aspects of culture and language are taught through a hands-on approach. Information is also available through on-line resources.[7] Although the Nisga'a will never revert to a traditional system of plant classification in their everyday or working life, the knowledge, once suppressed, is again being preserved.

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[7] Classes are not restricted to Nisga'a citizens alone. Non-native students are enrolled in Nisga'a classrooms at all levels and the on-line resources are freely available to all.

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Chapter 4

Exploring Aspects of Plant Distribution, Plant Names and Trade

> *That's why we have the grease trail ... where the road is now. That's what they used. Even the people from Telegraph Creek come to trade with the Nisga'a ... not just grease, but all kinds of stuff. And on the other side, the Tsimshian Nation, they come to trade with halibut, sun-dried halibut strips. They trade with us, with our eulachons. The eulachon grease is very famous, everywhere. Even Haida, they came to trade with us. At Easter, the Haida come, we don't have radios in the olden days and then all of a sudden the canoes come, Haidas, Tsimshian, Gitxsan. And they celebrate and trade* (Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

> *Fishery Bay [is] the main thoroughfare of the Indian life on the whole northwest coast. The natives from far and wide always tried to gain a foothold here, to share in the bounties that made life easy and prosperous. The place was "like a magnet" for its abundance of food to the tribes all around; it drew to itself many people from long distances* (Barbeau 1927a).

4.1. Introduction

As in other areas of North America, indigenous peoples have occupied the land in the northwest of British Columbia (BC) for many thousands of years (Cybulski 1992; Carlson 1994; Nisga'a Tribal Council 1995, Vol. I). Over this period, although territorial boundaries were frequently redefined for social and political reasons (Sterritt et al. 1998; Marsden 2000), trade between northwestern nations has played an important role in their economies. The existence of an extensive network of trails, known today as the Grease Trails (Figure 4.1), is further evidence of such trade (MacDonald 1984a; Birchwater 1993; Campbell 2005). These trails were an ancient coastal inland trade network, named for the eulachon grease that was widely traded between nations. Eulachons (*Thaleichthys* *pacificus*) and eulachon grease were not the only products of trade carried along the trails. Plant foods, such as berries, medicinal plants and plant materials for technological use were also traded (Birchwater 1993; Turner and Loewen 1998).

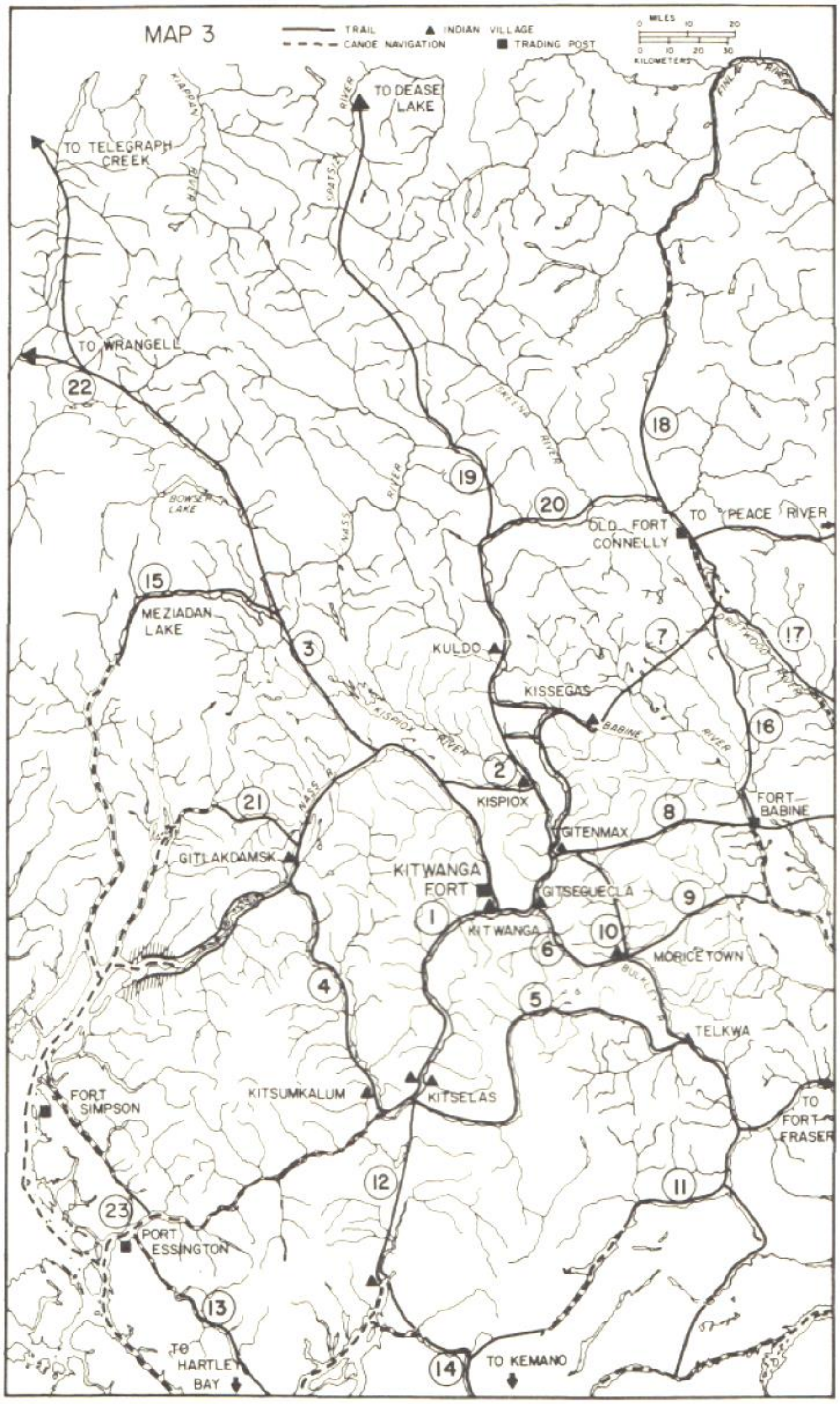

Figure 4.1. Map of the some of the trails that linked the traditional territories in northwest British Columbia (G. McDonald 1984).

Trade among the northwestern peoples was an important aspect of their economy long before their first contact with Europeans. Nations met annually at seasonal camps to trade goods abundant within one territory for goods abundant in another. At that time knowledge was also shared with respect to medicinal plants and the preparation of new medicines (Sim’oogit Bax̲-K’ap – Jacob Nyce 2008; Sim’oogit Hayḿaas – Chester Moore 2008; Sim’oogit Gadim G̲aldoo’o – Charles Alexander 2008). Similarly, techniques for the gathering and storing of food (Sigidimnak̲’ K’igapks – Alice Azak 2008) and technological innovations for building the goods necessary for survival (e.g., canoes, housing, clothing) were also exchanged (Sim’oogit Ni’is Nag̲anuus – Steven Doolan 2008; Sim’oogit Gwiis Ha – Roger Watts 2008).

The enrichment provided by socio-cultural interactions and exchange between people was an important aspect of life prior to first contact (People of ‘Ksan 1980; Turner and Loewen 1998; Daly 2005; Sim’oogit Gadim G̲aldoo’o 2008; Sigidimnak̲’ K’igpaks 2008). The trading of plant products and exchange of knowledge was facilitated by seasonal rounds[1] practiced by each nation, fishing (especially fishing for eulachon) and through inter-marriage (Oberg 1973; People of ‘Ksan 1980; Albright 1982; 1984; Turner and Loewen 1998; Mitchell and Donald 2001). Such trading, while providing increased access to both goods and knowledge, also provided the resilience to cope with environmental and social stress and change by extending access to resources beyond those available on home territories (Gadgil et al. 1993; 2003; Berkes et al. 2000; Turner et al. 2003).

In addition to the exchange of goods, similar names given to plants suggest that terminology was exchanged as well. These similarities suggest that names were borrowed, adapted or evolved among northwestern[2] nations or were derived from common ancestral terms. The practice of borrowing words from a donor language by a recipient language for social-cultural, economical and geographical reasons is a common occurrence around the world (Hock 1991; Campbell 2004). One logical hypothesis for

[1] Seasonal rounds involved going to different parts of their traditional territories in different seasons to harvest different resources.

[2] As described in chapter two, throughout this work northwestern nations are considered to be from latitudes 52^{o} to 60^{o} N and longitudes 126^{o} to 136^{o} W, corresponding approximately to the south tip of Haida Gwaii and north to the BC/Yukon border, west of the divide between the Skeena and Fraser River drainages between Burns Lake and Houston.

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the commonalities that exist in the names given to some plants in the Northwest is that names were traded with the plants or plant products. In particular, where a species was not abundant on a given territory, trade for that species occurred with a neighbouring nation which had the species in abundance on its territory. Determining the possibilities of such connections is helpful in further understanding both the cultural and economic relationships that existed in the Northwest.

4.2. Rationale

First Nations of northwestern BC include the Nisga'a, Gitxsan, Haida, Tlingit, Tsimshian, Tahltan, Haisla, Henakksiala, Oweekeno, Nuxalk, Heiltsuk and the Wet'suwet'en (Figure 4-2). However, this chapter is concerned with the Nisga'a and their immediate neighbours, the Haida, Gitxsan, Tsimshian, Tlingit and Tahltan, all known trading partners of the Nisga'a (Manson 1832; Ogden 1834; Barbeau 1923; People of 'Ksan 1980; Turner and Loewen 1998; G. McDonald 1984; J. McDonald 1984; Miller 1997; Daly 2004; Turner 2004; Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

Given the close physical and social connection between the Nisga'a and their neighbours and the resources available to each of them, it is the purpose of this chapter to compare the distribution of seven plant species known to grow in both coastal and interior areas of the province north of 52^{o} N and west of 126^{o} W in order to:

- learn about the trading history from contemporary knowledge holders and secondary literature sources;
- look for regional abundances and shortages of these species on each of the traditional territories as the basis for trade; and
- explore possible linguistic relationships between the names given to each of these species by the Nisga'a and their immediate neighbours as potential evidence of trade.

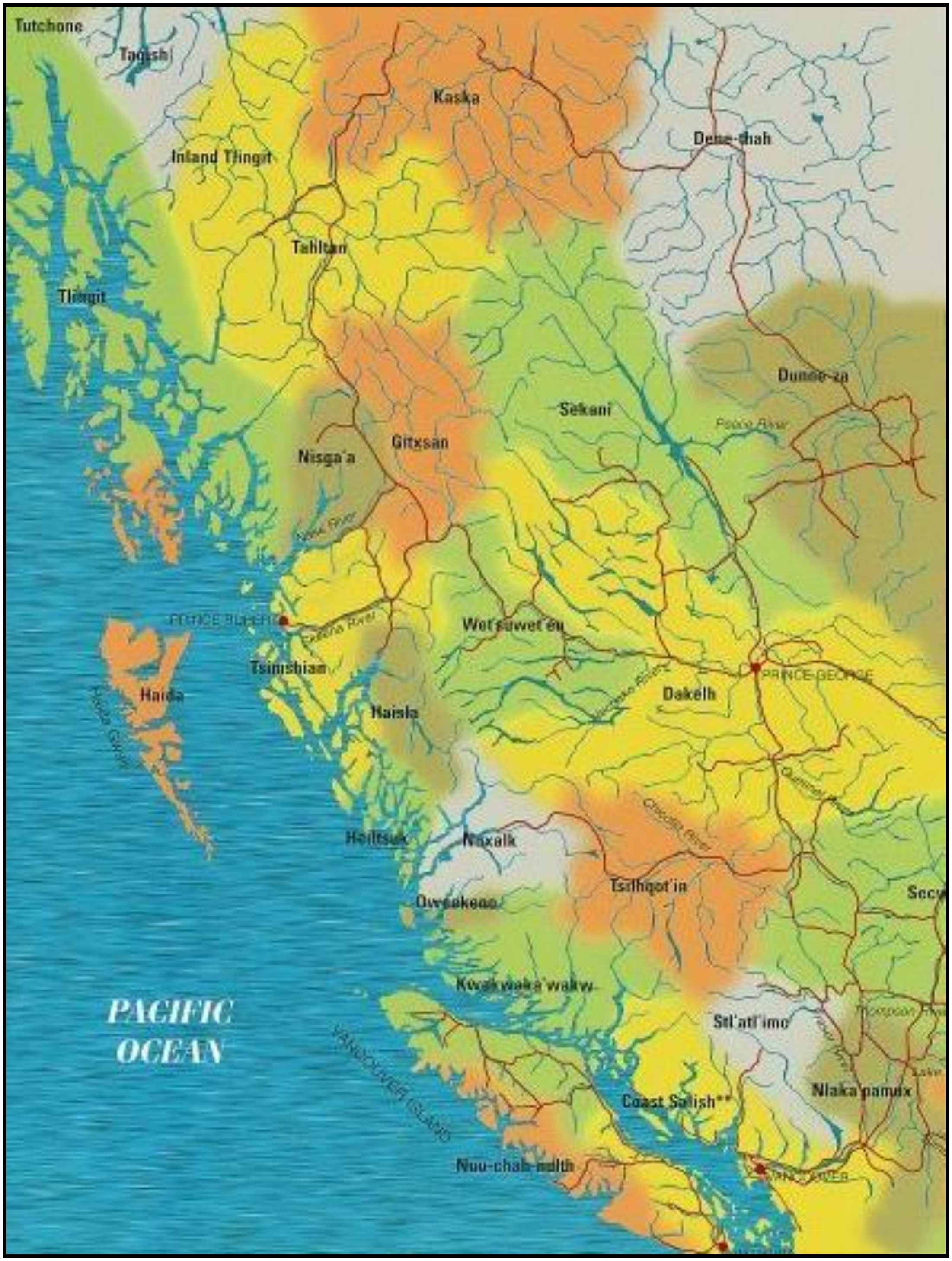

Figure 4.2. Map showing traditional territories of First Nations of western British Columbia and neighbouring U.S. states (from http://www.bced.gov.bc.ca/abed/map.htm; used with permission #7200002639).

Assessing a link between plant distribution, plant naming and trade is challenging. Plant distributions are imperfectly known and the boundaries and shared areas of traditional territories were fluid over time as land was acquired or lost through intermarriage, adoptions, for repayment of wrongdoings and wars (Nisga'a Tribal Council 1995, Vols. I, II and IV; Sterrit et al. 1998; Beynon 2000; Marsden 2000). In addition, over the last 250 years, there have been major disruptions in First Nations cultures as non-natives took over traditional territories and imposed their colonial cultures on indigenous peoples. This takeover resulted in the erosion of many traditional cultural practices, including the harvesting of plants, trading patterns and the diminishing use of native languages (Nisga'a Tribal Council 1995, Vol. I; Kirkness 1998; Smith 2002). Since the exact extent and ecological attributes of a nation's traditional territory throughout its past are not known, nor is it definitively known when and where specific words were coined or adopted within a nation or proto-nation, any such attempts at correlation will always be imperfect.

4.3. Study Area

Prior to first contact, description of a particular area was often encoded in the name given to it by the people who claimed the territory. Title to a particular area of Nisga'a land was often held by clan chiefs who had detailed knowledge of specific places. This knowledge was learned through training that began in early childhood. Such places were given names based on intimate knowledge of a particular area (Nisga'a Tribal Council 1995, Vol. IV). Nisga'a place names might describe the history of a place and so denote ownership and title, but they could also describe physical features, ecology, habitat, biogeography or activities, including plant gathering, that regularly occurred at a particular location (Nisga'a Tribal Council 1995, Vol. IV). Large areas were described often based on topographical features. For example **la<u>x</u>mihl** is the name for the lava beds, **ts'imt'in** for valley, **sganist** is mountain and **sixsganist** denotes mountains.

Place names were therefore a way of affixing a recognized label to a site, but could also be a useful way of describing features important to its use and management (e.g., what plant species grew there, whether the site was wet or dry). The knowledge remembered and imparted through place names contributed to an oral understanding of site-specific terrain factors, species presence, dominant vegetation, biodiversity, ecological succession and other descriptive ecological factors. This system of naming places is typical of many indigenous peoples in the Northwest and around the world (Basso 1996; Johnson 2000; Turner et al. 2000, Johnson and Hunn 2010).

After European contact, many of these place names and descriptions were changed to reflect values important to the colonizers. Such names did not often reflect habitat or geographical descriptions or the great depth of local resource management. For example, the present day Haida Gwaii was renamed “Queen Charlotte Islands” by explorer George Dixon, after his ship, which in turn was named after Queen Charlotte of England (Walbran 1971). Similarly the Nisga’a village of Laxgaltsap was renamed Greenville after a Methodist missionary, Alfred Green, who set up a mission there (Brock 2010). These types of name changes led to an erosion of local ecological and historical knowledge and contributed to a decline in knowledge of traditional ecosystem classification.

Much later in BC, ecologists developed a system for classifying and describing different ecosystems in the province called the biogeoclimatic ecosystem classification (BEC) system (Pojar et al. 1987). Within this word, “bio” indicates the biological nature of the area (what plants are found there), “geo” reflects the soils, geology and terrain of the area, and “climatic” refers to the prevailing climatic conditions. This system groups together ecosystems with similar climate, soils and vegetation over the entire province. In each BEC zone there are distinctive combinations of dominant plant species plus species that may be unique to that zone (Meidinger and Pojar 1991). Zones are named based on the dominant climax vegetation found in the area. For example, the Coastal Western Hemlock zone (CWH) is so named because climax forests on mesic sites are dominated by western hemlock (*Tsuga heterophylla*) along with other conifers that thrive in the coastal climate. Although the BEC system is not a system devised by First Nations people, it is widely recognized and used as a standardized tool derived from careful field analysis of the distribution of vegetation throughout the province (MacKinnon et al. 1992). As such, it will facilitate the comparison of plant species distribution on the traditional territories considered in this chapter.

4.3.1. ***Ethnographic context***

4.3.1.1. *Nisga'a First Nation*

Nisga'a traditional territory is in the Nass River valley in northwestern British Columbia. (see Chapter 1 for details). Historically, their traditional territory gave the Nisga'a access to areas in both the coastal temperate rain forest and the continental interior forests, as well as alpine, subalpine and marine areas. They would therefore have been in the position of being able to hunt, fish and harvest plant species for their own use and for trade over a large range of ecosystems. Nisga'a traditional territory includes areas where large quantities of eulachons can rightfully be harvested, which in the past provided the Nisga'a with enough eulachons for their own use as well as serving as an item of trade.

The eulachon is a small oily fish in the smelt family that spawns in coastal estuaries in late winter and early spring. A mainstay in the Nisga'a diet after long cold winters, it and the oil ("grease") derived from it is also high prized by First Nations in the adjacent areas (People of 'Ksan 1980; McNeary 1976; Sim'oogit Ni'isjoohl – Horace Stevens 2007; Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

Eulachons and eulachon grease were two of the most important trade items of the Nisga'a in traditional times. In fact, they were so important that the name "Nisga'a" is said to originate from the word for upper lip, **nisk**, and the word for lower lip, **tl'aak**. These two words are related to the eating of eulachons on their arrival at the end of a long winter. Stories say that all creatures when eating eulachons have a conspicuous upper lip and use both their upper and lower lip (Nisga'a Tribal Council 1995, Vol. I; Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin pers. comm. 2011).

The languages of the Nisga'a, Gitxsan and Coast Tsimshian are related and fluent speakers of these languages can be understood by one another to some extent (Tarpent 1987; Rigsby pers. comm. 2007; Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2011). Nisga'a and Gitxsan are more closely related to each other than either is to Coast or Southern Tsimshian (Rigsby and Kari 1987). The three languages are very similar and are considered by linguists to belong to the same language family (Seguin 1984; Rigsby pers. comm 2007; 2011; Tarpent pers. comm. 2011), which some consider to be part of the Penutian[3] stock (Tarpent 1997; Gordon and Grimes 2005). Where information with respect to Nisga'a plant use has not yet been retrieved for a particular species, but is recorded for the Gitxsan or Tsimshian, similarities in plant names may provide clues for Nisga'a use of that species.

4.3.1.2. *Gitxsan First Nation*

The traditional territory of the Gitxsan extends approximately from 54.50° to 57.27 ° N and from 126.73 ° to 130.19 ° W. It is interior territory with easy access to rivers for food and transportation. As such, their territory provided the Gitxsan with an abundance and variety of fish, fowl, land mammals and plants for their personal consumption and trade (People of 'Ksan 1980).

The importance of the Skeena River to the Gitxsan culture is reflected in their name. Gitxsan translates to "the People of 'Ksan" and is derived from "git" which means people in their language, and "xsan" ('ksan). "Ksan" is their name for the Skeena River that runs through their traditional territory. This river undoubtedly played an important role in their cultural economy, providing them with fishing grounds and water routes for trade with their neighbours.

The Gitxsan language contains two regional dialects, known as western (Geets) and eastern (Gigeenix) (Rigsby and Kari 1987; Gordon and Grimes 2005). The western dialect has many plant names similar to those of the Nisga'a. This is not surprising considering their close proximity to one another and their patterns of regular interactions.

4.3.1.3. *Tsimshian First Nation*

Tsimshian traditional territory extends approximately from 51.70° to 55.14 ° N and 127.50 ° to 131.15 ° W. This area includes the lower Skeena River drainage basin on the mainland, and the archipelago of islands from the mouths of the Skeena and Nass Rivers south as far as the Estevan Islands in Hecate Strait. In addition, they have territory around Metlakatla, Alaska, on Annette Island (McDonald 2005a). Historically the Tsimshian

[3] Penutian is a language family composed of languages from California and Oregon. Some researchers propose that the Tsimshianic languages are part of this group (Tarpent 1997).

were divided into 14 tribes and in modern times they consist of seven tribes (Martindale and Marsden 2003; Downs 2006; Kitsumkalum First Nation 2012).

Like the Gitxsan, their access to the Skeena River played an important role in their traditional lifestyle. The word Tsimshian (Ts'msyen) translates to "within the Skeena River," where "Ts'm" is "in, within or inside," and "(k)'syen"[4] denotes what is now known as the Skeena River (Miller 1997; Anderson pers. comm. 2012). The proximity of the Tsimshian to the ocean and their access to the Skeena River as part of their traditional territory provided them with the opportunity to become skilled at fishing and marine mammal hunting. The mild wet winters of the coast produce dense stands of conifers with lush shrub and understory vegetation which provided easy access to harvest many coastal plant species for their needs and for trade with others.

The language of the Tsimshian people consists of two dialects, the Coast Tsimshian (Sm'algyax – "real or true language") and the Southern Tsimshian language known as Sguxs by the people living in Klemtu (Halpin and Seguin 1990; Compton 1993; Tarpent 1997; Gordon and Grimes 2005).

4.3.1.4. Haida First Nation

Haida traditional territory extends approximately from 51.95° to 56.0 ° N and 130.86 ° to 134.40 ° W. It consists of the entire offshore archipelago of Haida Gwaii (consisting of two main islands, Graham and Moresby, and approximately 150 smaller islands) and some islands along what today is called the Alaska Panhandle, situated 80 km off the mainland immediately west of Tsimshian traditional territory (Boelscher 1989).

The original Haida word for the Haida nation and their territory is **xàayblaagwaayaay** (Skidegate/Southern Haida) or **xaadlaagwaayee** in Massett/Northern Haida, which translates broadly to "people of the homeland;" the Haida word "xadee" translates to "people" in English (Blackman 1982; Boelscher 1989; Enrico 2005). Their traditional territory consists primarily of islands in the rain forests of BC and Alaska, limited in area and with much mountainous terrain. Like the Tsimshian, the wet mild climate provided the Haida with easy access to dense stands of conifers, lush shrubs and understory vegetation for their own sustenance and trade. In the past, the physical

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4 Here the "k'" in front of "syen" is a prefix used in a place name and translates to "place of."

isolation of the Haida did not inhibit their ability to trade with other nations. Because of their physical location there was an abundance of western redcedar (*Thuja plicata*) growing on their territory. Easy access to this species facilitated the development of their skills and expertise in canoe building (Drucker 1965). Their large canoes were prestigious items of trade with their mainland neighbours (McNeary 1976; Norton 1981; Turner 2004). In addition, their offshore location provided them with easy access to a large variety of seafood important for their own use and for trade (Turner 2004).

The Haida language is considered a language isolate, meaning that it developed independent of other languages. However, there is some discussion regarding a possible genetic link between the Tlingit Nation to the north and the Haida (Enrico 2005). There are two major Haida dialects, northern and southern. The northern group is divided into Alaskan or Kaigani Haida and Massett (Northern Graham Island) Haida. The southern Haida had two dialects (Skidegate and Ninstints) but the Ninstints dialect is no longer spoken (Duff 1992; Enrico 2005).

4.3.1.5. *Tahltan First Nation*

Tahltan[5] traditional territory is located in northern British Columbia and extends into the Yukon, approximately from 56.14^{o} to 59.87^{o} N and from 126.75^{o} to 133.09^{o} W. Their oral traditions place them as the original people of the Stikine River watershed (Edōsdi 2012). The Tahltan call themselves titcaxhanotēn (“people of titcaxhan” which is an ancient headquarters near the mouth of the Tahltan River. Titcaxhanotēn translates to “salmon ascending the creek” (Edōsdi 2012).

Like the Gitxsan, their traditional territory is entirely interior. It centers on the upper reaches of the Stikine, with hunting grounds extending south to the drainage basin of that river and is bounded by the Coast Mountains to the west and the Cassiar Range to the east. Their traditional territory is immediately adjacent to Tlingit territory to the west and the Nisga’a and Gitxsan territories to the south. Traditionally, they fished for salmon in the Stikine at Nine Mile Flats in the summer and here they traded with the Tlingit, who

[5] “The name Tahltan by which the tribe is now (altogether) known to white people is claimed to be of Tlingit origin. Tałtankwan was formerly a common general term used by the Taku and Wrangel Tlingit for the tribe. It is really a Tlingit name for the low flat on the West side of the mouth of Tahltan River just opposite Titcaxhan” (Edōsdi 2012).

were their closest trading partners (Emmons 1911; Albright 1982). The Tahltan traditionally hunted in the uplands of their territory for moose and other game and gathered berries for winter storage. In the past the Tahltan travelled primarily by foot when hunting and used dog sleds and packs to transport their game (Albright 1982, McIlwraith 2007). They were frequently in dispute with the Nisga'a hunting grounds to the south (Emmons 1911, McIlwraith 2007; Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin pers. comm. 2012).

The Tahltan language, known as **Didenekeh** by the Tahltan, is a member of the northern branch of the Athapaskan Language Family (Poser 2003; Edōsdi 2012), which is made up of three subgroups: Northern, Pacific Coast and Apachean. The Northern branch includes First Nations in the interior of British Columbia, northern Alberta, northern Saskatchewan, northern Manitoba, Yukon Territory, Northwest Territories, and the interior of Alaska (Bob 1999). It is related to the Eyak language of southern Alaska, which is not spoken today (Gordon and Grimes 2005).[6]

4.3.1.6. *Tlingit First Nation*

Tlingit traditional territory extends approximately from 54.70^{o} to 60^{o} N and from 130.23^{o} to 140^{o} W. Today the Tlingit are frequently referred to as two groups, the Inland Tlingit and Coastal Tlingit (Figure 4.2). The Tlingit people were of interior origin. However, some headed to the coast in search of better living conditions and ultimately became primarily a coastal people who used canoes for their transportation and harvested much of their food from the sea. Ultimately the trade between Inland and Coastal Tlingit was controlled by the coastal people (Emmons 1991).

The word "Tlingit" is used by the Tlingit to distinguish a human being from an animal (Emmons 1991). The Tlingit dictionary lists the word "**leengít**" for "person" and the Tlingit people (Naish and Story 1996). The Tlingit language is considered a Na-Dené language distantly related to Eyak and the Athapaskan languages. Tlingit dialects include Tongass Tlingit, Sanya Tlingit, Henya Tlingit, Transitional Tlingit, Central Tlingit, Gulf Coast Tlingit and Inland Tlingit (Crippen 2011).

[6] Athapaskan and Eyak are related to Tlingit in the Na-Dene Language Grouping (Leslie Saxon pers. comm. 2012)

The Tlingit appear to have often controlled trade with the Tahltan. For example, although the Tlingit did not claim fishing rights on the Stikine River, they claimed exclusive fishing rights on all northern tributaries of the Stikine and ownership of the adjacent berry patches on what was considered Tahltan territory (Teit 1912 *in* McClellan 2001, Emmons 1991).

4.4. Methods

In order to explore the likelihood of trade for a particular plant product based on plant species distribution, it was necessary to evaluate the distribution of selected species relative to the First Nations territories included in this study. To this end:

- seven plant species were chosen for evaluation;
- information on their distribution throughout the study area was collated;
- maps were generated to portray plant species distributions as they relate to biogeoclimatic zones and traditional territories; and
- plant names employed by the different northwestern First Nations were tabulated and compared.

4.4.1. *Species Selection*

Seven plant species were selected for evaluation, one tree, six shrubs and one herbaceous species (Table 4.1). Plants were selected based on reportedly broad versus narrow distributions and the value of these species to northwestern First Nations. Most collaborators knew the Nisga'a name for each of the selected species, even though not everyone could recall specific uses for all of them. Some species were widespread, some more restricted in distribution. All but one of the species, beaked hazelnut, (*Corylus cornuta*), is found on all six traditional territories. Hazelnut was included for evaluation because of its documented use (People of 'Ksan 1980; Smith et al. 1997; Turner 1997), nutritional value and ease of harvest and storage (Kuhnlein and Turner 1991, Turner 1997), and the unusual occurrence of a disjunct population on Gitxsan territory (Krajina 1982).

Table 4.1. List of species studied to look for evidence of trade.

Common name	Species	Family	Growth form	Primary use
devil's club	*Oplopanax horridus* (Sm.) Miq.	Araliaceae	shrub	medicine
beaked hazelnut	*Corylus cornuta* Marsh.	Betulaceae	shrub	food
soapberry	*Shepherdia canadensis* (L.) Nutt.	Elaeagnaceae	shrub	food
black huckleberry	*Vaccinium membranaceum* Douglas ex Torr.	Ericaceae	shrub	food
false hellebore	*Veratrum viride* Aiton	Liliaceae	herbaceous	medicine
Pacific crabapple	*Malus fusca* (Raf.) C.K. Schneid.	Rosaceae	shrub	food
western yew	*Taxus brevifolia* Nutt.	Taxaceae	tree	medicine

4.4.2. *Species Distributions*

To determine the distribution of species on the traditional territories, data were gathered from herbaria at the University of Victoria (UVIC), the Royal BC Museum (V), the University of British Columbia (UBC), the Canadian Museum of Nature (CAN, CANA, CANAL, CANAM), the University of Alaska (ALA) and the complete relevé (field plot) data base associated biogeoclimatic ecosystem classification (BEC) field work conducted by provincial government ecologists. For each collection record, the latitude and longitude were recorded. The numbers of documented collections or observations of each species on each territory were tallied, and expressed as a proportion of the total number of collection records for that species in the study area.

4.4.3. *Map Creation*

Biogeoclimatic zone boundaries (v7.0 classification, 2009) were obtained from GeoBC[7] and mapped as one layer on a provincial base map[8] (Albers 1983 projection) using the ArcMap v9 (ESRI[9] 2012) geographic information system (GIS). Dr. Tongli Wang of the

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[7] Biogeoclimatic base map available at:
http://apps.gov.bc.ca/pub/geometadata/metadataDetail.do?recordUID=51819&recordSet=ISO19115
[8] Provincial base map available at:
http://maps.gov.bc.ca/arcserver/rest/services/Province/albers_cache/MapServer
[9] ESRI is the acronym for the Environmental Systems Research Institute of Redlands, California.

University of British Columbia provided the BEC equivalent climate zones for neighbouring Alaska (Wang and Aitken *in press*). The maps were cropped to include only the areas of study (i.e., lands north of 52^{o}N and west of 126^{o}W.) The boundaries of First Nations territories were manually digitized from a map produced by the Union of British Columbia Indian Chiefs (1993), and added to the cropped map as another layer. Finally, a point coverage based on the documented distribution of the seven plant species shown in Table 4-1 was added as another layer.

Once the data were compiled for creating the maps, the relative abundance of each species found on each territory was determined. This was done by making GIS intersections of observed plant locations with the boundaries of BEC zones and First Nations territories. The total number of samples collected or observed for each species on each territory was divided by the total number of samples collected or observed and expressed as a percentage. Similarly, an estimate of relative abundance for each species in each biogeoclimatic zone across all territories was calculated by dividing the number of plant collection or observation points in each zone by the number found across all zones.

4.4.4. *Comparison of Plant Names*

For purposes of evaluating the unique or similar names for each species under study, the most recent written sources and current online resources were used to provide species names in each language. Nisga'a plant names are from the most modern Nisga'a dictionaries (McKay et al. 2001, Williams 2006, Tarpent 2011), and from First Voices (available at http://www.firstvoices.com/en/Nisgaa). Gitxsan words are from Hindle and Rigsby (1973) and First Voices (available at http://www.firstvoices.com/en/Gitsenimx). Tsimshian words are from Anderson et al. (n.d.), and Campbell (2005). Haida words are from Tuner (2004). Tlingit words are from Naish and Story (1996) and from James Crippen (pers. comm. 2011). Tahltan words are from Turner (2011).

4.4.5. *Limitations of the Data*

While the distributional data and the resulting maps appear to reasonably portray species distributions, they are by no means complete. Clearly they show only a sample of where each species is likely to be found. Although herbarium collections are a good source for this type of data, there are shortcomings with determining species presence or absence based on herbarium data alone. Typically species are sampled in the most easily accessed areas (where there are roads), so many places where a particular species might occur have not yet been accessed or collected from. In addition, there are undoubtedly locational inaccuracies in some of these data, especially the older collections. Alaska was not sampled in the ground plots represented in the BEC database, and since a large part of the data represented on the maps is based on BEC data, the intensity of observations for the Tlingit and the more remote northern Inland Tlingit and Tahltan territories is likely not as great as it is elsewhere. The affinities of plant species with different BEC zones (see vegetation tables in Banner et al. 1993) allow one to infer their distribution somewhat from the BEC zone distributions, which are also provided and described with respect to their overlap with different First Nations Territories.

4.5. Results

Despite the caveats noted above, the seven species maps clearly show an uneven distribution of some plant species on the traditional territories of the Nisga'a, Gitxsan, Tsimshian, Haida, Tahltan and Tlingit[10] peoples. The distribution points on the map that represent the latitude/longitude where samples were collected or observed show a diffusion of points across the BEC zones that is generally in keeping with the reported range and habitat affinities of each species (Pojar and MacKinnon 1994). Table 4-2 shows the proportion of BEC zones in each First Nations territory. The species maps are presented individually below in the species by species discussion.

As summarized in Table 4.2, vegetation on the six traditional territories is broadly similar in that some of the same zones exist on all of the territories. All have Coastal Mountain-heather Alpine (CMA), Coastal Western Hemlock (CWH) and Mountain Hemlock (MH) biogeoclimatic zones on their territories. The Tlingit and Tahltan have all nine BEC zones present on their territories, while Tsimshian and Gitxsan have seven, the Nisga'a six and the Haida three. The proportion of available land within each particular BEC zone

[10] On the maps and in the Tables 3.2 and 3.3 "Inland Tlingit" does not include Inland Tlingit territory that extends into the Yukon.

varies by First Nation, suggesting that ease of access to important plant species also varied depending on the traditional territory and the natural distribution of the species in question.

Table 4.2 shows that all nations have territory in the treeless Coastal Mountain-heather Alpine (CMA) or Boreal Altai Fescue Alpine (BAFA) zones, although the Haida have less than 1% in the high-altitude CMA, and the Tsimshian ~7% in both treeless zones. The nations with more interior area on their territories have between 20% and 40% of their territory in the CMA and BAFA, giving them access to more interior plant species as well as access to land mammals. However, the Haida and Tsimshian have the highest proportion of Coastal Western Hemlock (CWH) on their territory, which makes up 96% of Haida territory and 73% of Tsimshian territory, while the Tlingit have 57% and the Nisga'a 27% of their lands as CWH. This wet coastal zone has an abundance of plant species (especially the highly treasured and widely traded western redcedar) as well as access to marine mammals for food and trade.

4.5.1. *Species Presence or Absence on Each Territory*

Based on herbarium and BEC data, Table 4.3 shows the relative frequency of each species present on each territory. Such comparisons allow speculation on the overall abundance and possible access to each species on individual territories and the possible need to trade for that species. The Nisga'a and the Tsimshian have all species present to some extent on their traditional territories (Table 4.3). All other territories have one to three species absent or not recorded in the source data. For example, the Gitxsan have the largest proportion of beaked hazelnut (95%) on their territory but no Pacific yew, while the Haida have a high proportion of the documented yew locations (90%) but no black huckleberry or hazelnut. The table suggests that the Tahltan and Inland Tlingit have no hazelnut, Pacific crabapple or Pacific yew.

Table 4.2. Distribution of biogeoclimatic zones on the traditional territories of First Nations in northwestern BC and Alaska.

	Nisga'a		Gitksan		Tsimshian		Haida		Tahltan		Tlingit		Inland Tlingit	
BEC zone	km^2	%	km^2	%	km^2	%	km^2	%	km^2	%	km^2	%	km^2	%
Boreal Altai Fescue Alpine (BAFA)	1428	9	6549	21	211	1	--	--	22490	31	697	1	10396	26
Boreal White and Black Spruce (BWBS)	--	--	--	--	--	--	--	--	8570	12	478	1	8983	23
Coastal Mountain-heather Alpine (CMA)	2265	15	293	1	2566	7	100	1	6688	9	16428	22	7218	18
Coastal Western Hemlock (CWH)	4166	27	928	3	26109	73	17793	96	1302	2	42895	57	731	2
Englemann Spruce Subalpine Fir (ESSF)	1536	10	13011	43	457	1	--	--	6413	9	638	1	1915	5
Interior Cedar Hemlock (ICH)	3047	20	6413	21	118	0	--	--	1090	1	58	0	0	0
Mountain Hemlock (MH)	3031	20	1127	4	6325	18	724	4	1729	2	12671	17	1249	3
Sub Boreal Spruce (SBS)	--	--	2012	7	33	0	--	--	1289	2	247	0	1634	4
Spruce Willow Birch (SWB)	--	--	127	0	--	--	--	--	23810	32	985	1	7677	19
Total	15473	100	30461	100	35819	100	18616	100	73380	100	75095	100	39803	100

Table 4.3. Relative frequency of each species on each traditional territory.

	Nisga'a	Gitxsan	Haida	Tsimshian	Tahltan	Tlingit	Inland Tlingit	Total	Total Samples
Species	%	%	%	%	%	%	%	%	
Corylus cornuta	3.1	95.4	0.0	1.5	0.0	0.0	0.0	100	65
Malus fusca	12.2	10.8	29.7	25.7	0.0	21.6	0.0	100	74
Oplopanax horridus	20.6	35.6	1.3	27.7	9.9	1.5	3.5	100	751
Shepherdia canadensis	3.8	25.8	0.5	3.8	46.2	0.5	19.4	100	186
Taxus brevifolia	1.6	0.0	85.5	8.1	0.0	4.8	0.0	100	124
Vaccinium membranaceum	11.1	62.5	0.0	14.3	10.6	0.5	0.9	100	574
Veratrum viride	11.0	22.8	24.2	27.7	4.9	4.5	4.9	100	425

4.5.2. *Distribution of Species by Biogeoclimatic Zones*

Although the collection and recording of individual plant species locations is not exhaustive, these species are each known to be more abundant in some ecosytems than others (Banner et al. 1993). The distribution of BEC zones within traditional territories can therefore indicate where each of this species can be expected to grow. Therefore, at least at a general level, ecosystem distributions can help indicate whether a particular species is more likely found at high elevations, along the coast or in the interior. Table 4.4 shows the relative abundance of each species in each biogeoclimatic zone, calculated based on the number of samples found across all biogeoclimatic zones in the study area.

4.5.3. *Individual Species Distributions*

The distribution of each of the species, based on data collected from herbaria and the BEC database, is summarized individually below. Although not exhaustive, they show some general patterns of species distribution from which general inferences can be drawn.

Table 4.4. Abundance of species (%) in each biogeoclimatic zone.

Species	BAFA %	BWBS %	CMA %	CWH %	ESSF %	ICH %	MH %	SBS %	SWB %	Total No.	%
Corylus cornuta	3.1	0.0	0.0	1.5	6.2	89.2	0.0	0.0	0.0	65	100
Malus fusca	0.0	0.0	2.7	75.7	2.7	12.2	6.8	0.0	0.0	74	100
Oplopanax horridus	0.8	0.4	0.4	41.5	4.8	42.7	6.4	2.9	0.0	751	100
Shepherdia canadensis	3.2	40.9	1.1	1.6	7.0	28.5	1.6	9.1	7.0	186	100
Taxus brevifolia	0.0	0.0	0.0	99.2	0.0	0.0	0.8	0.0	0.0	118	100
Vaccinium membranaceum	13.8	1.4	2.6	16.2	26.3	28.2	8.4	1.7	1.4	574	100
Veratrum viride	9.3	0.5	2.2	47.2	13.0	4.9	18.9	1.7	2.2	407	100

It is unlikely that there is *Malus fusca* in the CMA and the collections probably represent locational errors in the herbarium records.

4.5.3.1. *Corylus cornuta* var. *cornuta* Marsh. (beaked hazelnut)

The distribution of beaked hazelnut in Figure 4.3[11] shows that it is found predominantly in the Interior Cedar-Hemlock (ICH) zone, on Gitxsan traditional territory (Table 4.3). Two other collections of beaked hazelnut in the ICH have also been documented on Nisga'a territory. This distribution is consistent with research that indicates that this variety of beaked hazelnut is an interior species more common in southeastern British Columbia and coastal Vancouver Island, with a disjunct population near Hazelton, BC (Krajina et al. 1982, Pojar and MacKinnon 1994).

4.5.3.2. *Malus fusca* (Raf.) C.K. Schneid. (Pacific crabapple)

The distribution of Pacific crabapple (Figure 4.4) shows that it is found on all traditional territories except that of the Inland Tlingit and Tahltan (Table 4.3). This species thrives on moist to wet, open forests, streambanks (Douglas et al. 1999b) and this characteristic is reflected in its distribution predominantly in the CWH on Haida, Tlingit and Tsimshian territories. It occurs sporadically at elevations up to the lower edge of the Mountain

[11] Traditional boundaries presented on all species distribution maps are not intended to represent legal boundaries and should be considered approximate representations only.

Hemlock (MH) zones on Tsimshian, Nisga'a and Tlingit territory (Figure 4.4, Table 4.4). Scattered populations do occur in the ICH and at elevations bordering on the Engelmann Spruce – Subalpine Fir (ESSF) zone on Gitxsan territory.

4.5.3.3. *Oplopanax horridus* (Sm.) Miq. (devil's club)

The distribution of devil's club in Figure 4.5 shows that all nations had access to this species on their traditional territory (Table 4.3). It is distributed from low to subalpine elevations in the CWH, MH, ICH, ESSF, Sub-Boreal Spruce (SBS), BAFA, and Boreal White and Black Spruce (BWBS). For the Gitxsan, Tahltan and the Inland (Taku) Tlingit, documented locations are found at higher elevations. The Tsimshian have most (28%) of the documented devil's club locations on their territory, predominantly in the CWH, while the Haida have only 1%, all in the CWH zone. The Gitxsan have 26% of documented locations represented on their territory in the ICH and ESSF, while the Tahltan and Inland Tlingit with little or no ICH have it scattered in the SBS, ESSF, BAFA and BWBS. Since devil's club is known to be a moist site indicator species (Klinka et al. 1989), it can be assumed that the sites where devil's club has been recorded are moist to wet sites. The Nisga'a have devil's club scattered in the ICH, CWH and MH (21% of all documented locations) but the collections on their territory are predominantly from the ICH.

4.5.3.4. *Shepherdia canadensis* (L.) Nutt. (soapberry)

The distribution of soapberry in Figure 4.6 indicates that it is primarily an interior species that grows from low to subalpine elevations (Table 4.3). On this map, collections of soapberry are most abundant on Tahltan territory (with 46% of documented locations) in the BAFA, BWBS and ESSF zones. On Gitxsan traditional territory (26%), collections are from the ICH, ESSF and borderline SBS. There are also a few collections in the interior Nisga'a territory in the ICH and ESSF, and from interior Tsimshian territory in the MH and borderline CWH/MH zones. A curious result is one or two collections of soapberry on Haida territory at a high elevation (CMA or MH zone) and in the CWH right along the coast. With the exception of rare presence of soapberry on Haida Gwaii, the results are consistent with the ecological and habitat information found in E-Flora BC.

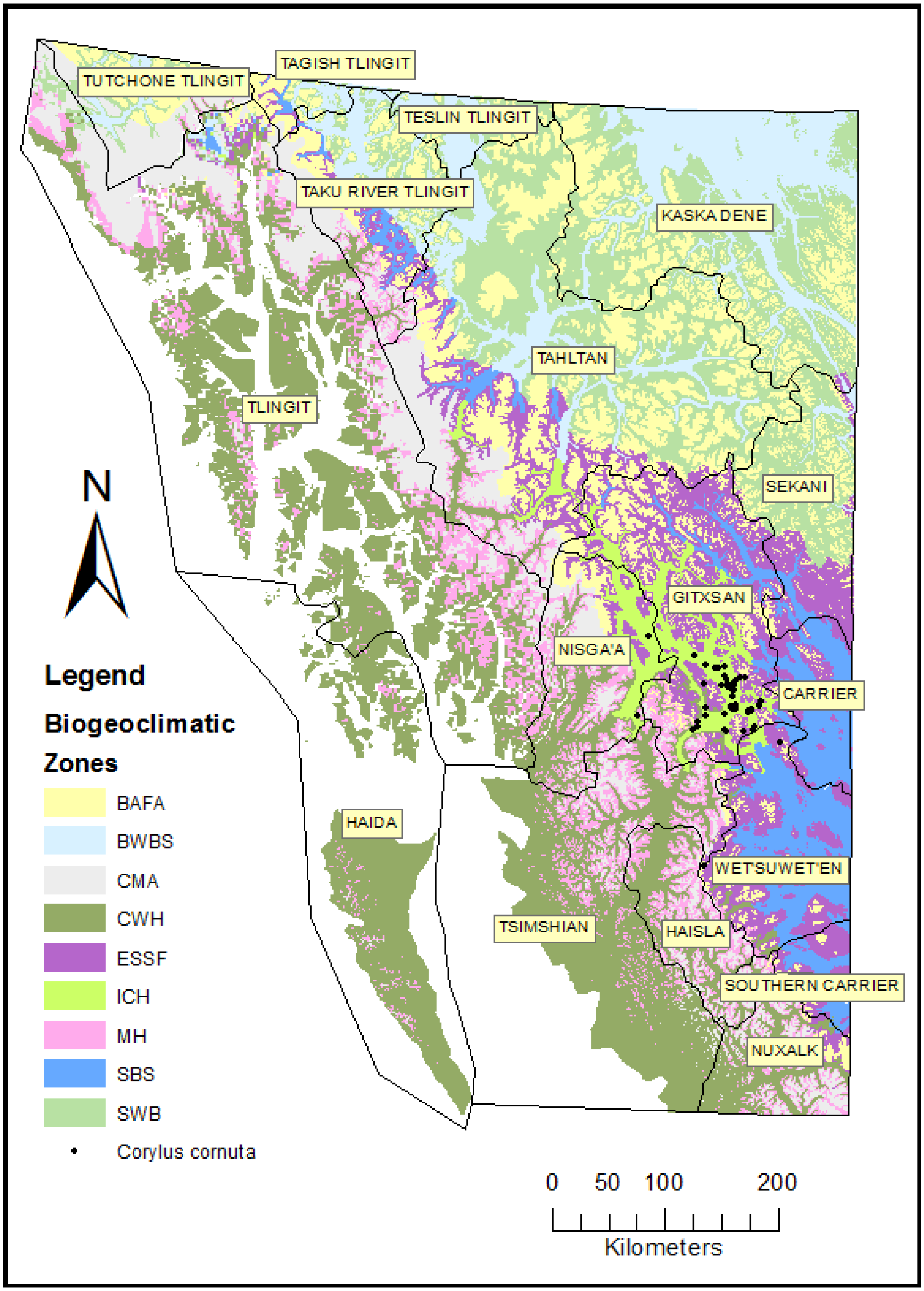

Figure 4.3. Distribution of *Corylus cornuta* var. *cornuta* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

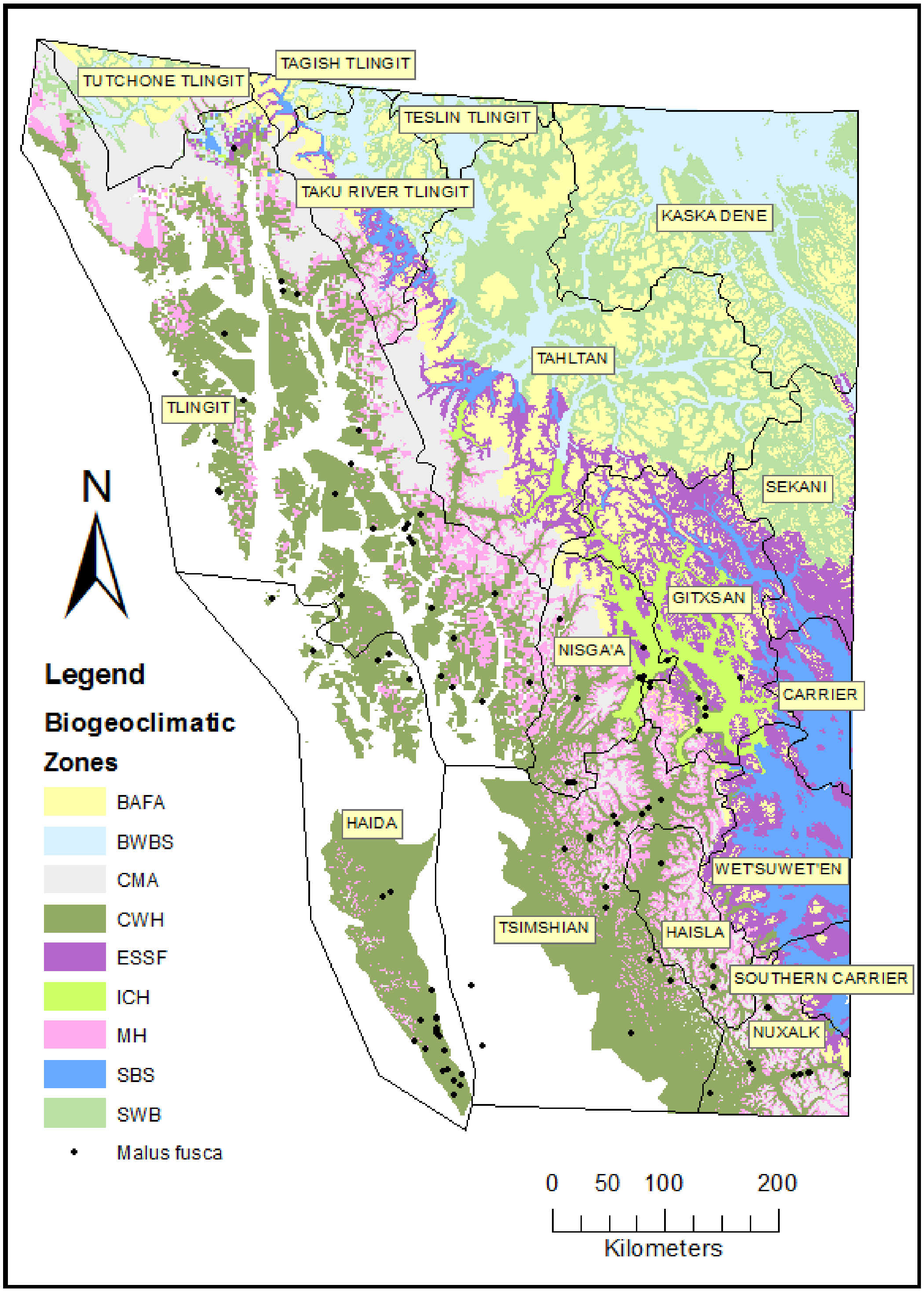

Figure 4.4. Distribution of *Malus fusca* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

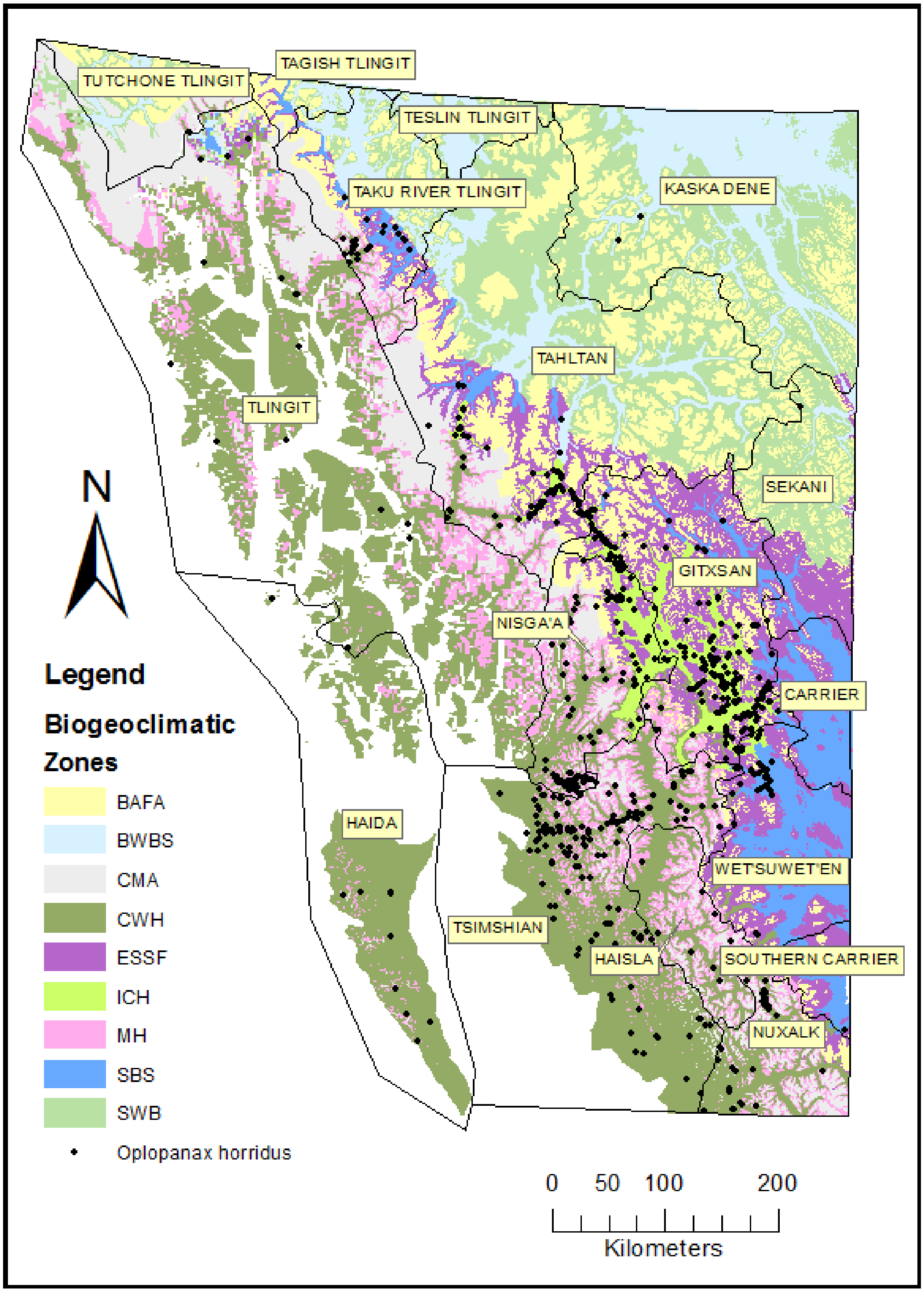

Figure 4.5. Distribution of *Oplopanax horridus* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

4.5.3.5. *Taxus brevifolia* Nutt. (Pacific yew)

The distribution of Pacific yew in Figure 4.7 shows that almost 90% of the collections are on Haida traditional territory in the CWH (Table 4.3), with a few scattered populations on Tsimshian and coastal Tlingit territory in the CWH and one collection in the borderline CWH/MH zone on Nisga'a traditional territory. The distribution as it is shown on the map is consistent with research that suggests that this species is common on moist to mesic slopes at low to middle elevations in the Northwest (E-Flora BC, Douglas et al. 1998).

4.5.3.6. *Vaccinium membranaceum* Douglas ex Torr. (black huckleberry)

The distribution of black huckleberry in Figure 4-8 shows that this generally high-elevation species is almost exclusively found in the interior of the traditional territories. It is found in greatest abundance on Gitxsan traditional territory (63% of documented locations) in the ESSF and ICH. It is less abundant but definitely present on Nisga'a (11%), Tahltan (11%) and Tsimshian territories (14%). On Nisga'a land it is in the ICH, MH, ESSF and BAFA zones, while on Tsimshian territory it is scattered in the CWH and MH zones and on the border between these two zones. On Tahltan land it is scattered throughout the BAFA, BWPS, and SBS zones, with just one or two collection in the ICH. The Inland Tlingit have a few scattered populations in the CWH, BAFA, and SBS zones (Figure 4.8, Table 4.3).

4.5.3.7. *Veratrum viride* Aiton (false hellebore)

False hellebore (Figure 4.9) is found in all nine biogeoclimatic zones, but it is most abundant in the CWH (Table 4.3). False hellebore is a very wet to moist indicator species (Klinka et. al. 1989), but can tolerate a range of cool temperatures as indicated by its growth in all zones (E-Flora). False hellebore appears most abundantly on Tsimshian (29% of documented locations), Haida (25%) and Gitxsan (23.8%) territories. On Tsimshian and Haida territory it is primarily in the CWH, while on Gitxsan territory it is scattered throughout the ICH and borderline ICH/ESSF zones. On Nisga'a territory (12%) it is found in the CWH, ICH, ICH/MH border areas, and ESSF zones (Table 4.3).

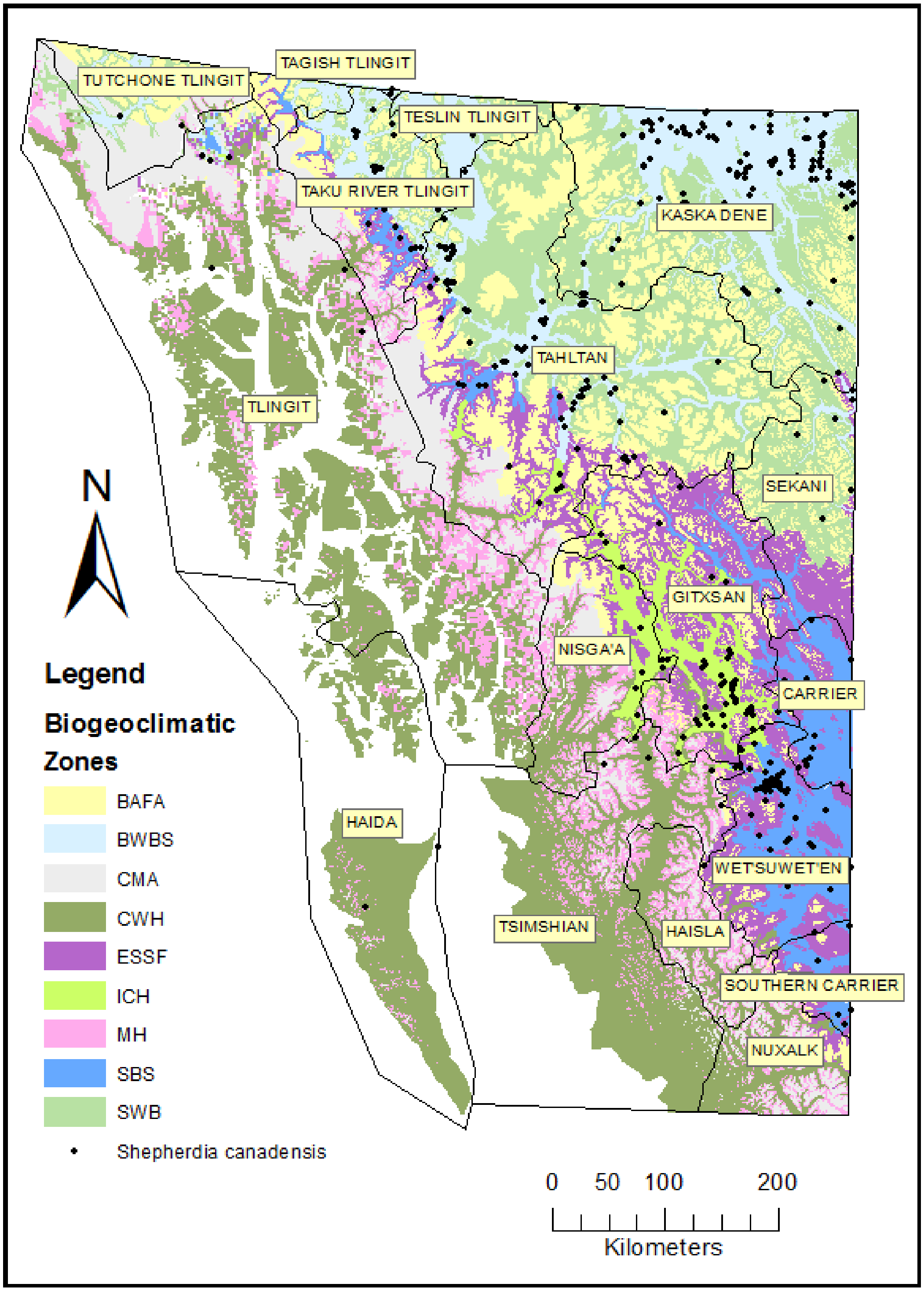

Figure 4.6. Distribution of *Shepherdia canadensis* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

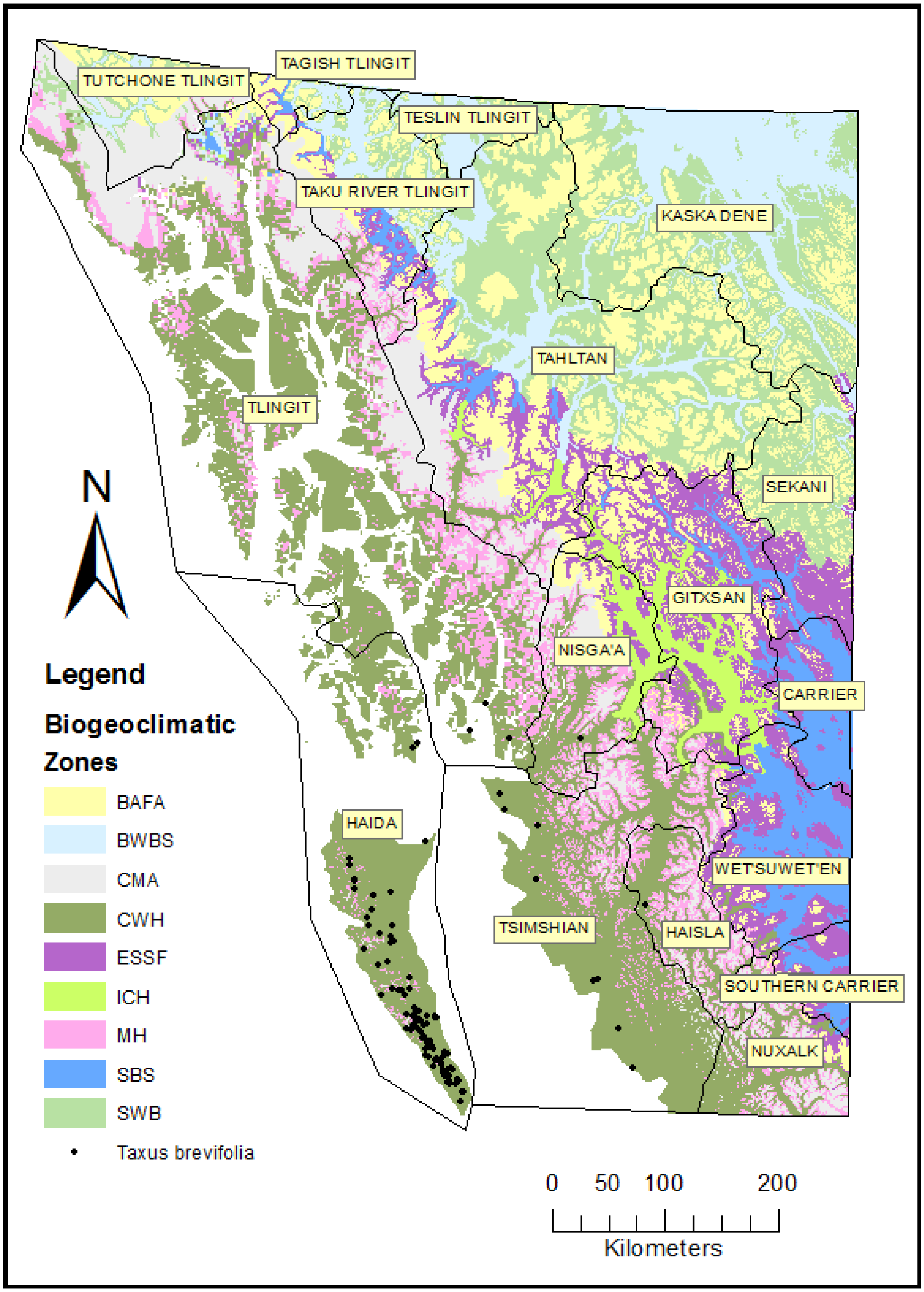

Figure 4.7. Distribution of *Taxus brevifolia* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

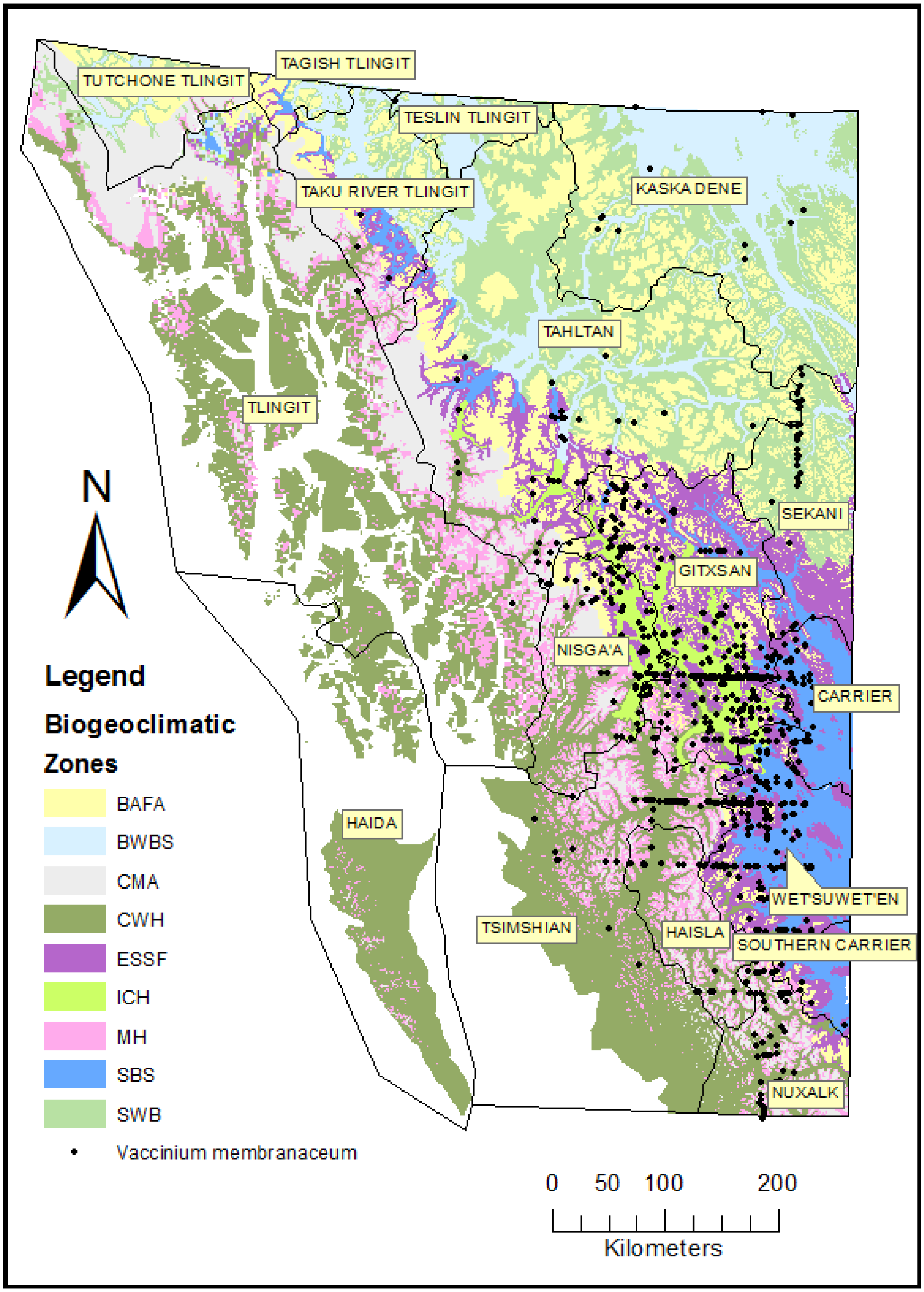

Figure 4.8. Distribution of *Vaccinium membranaceum* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

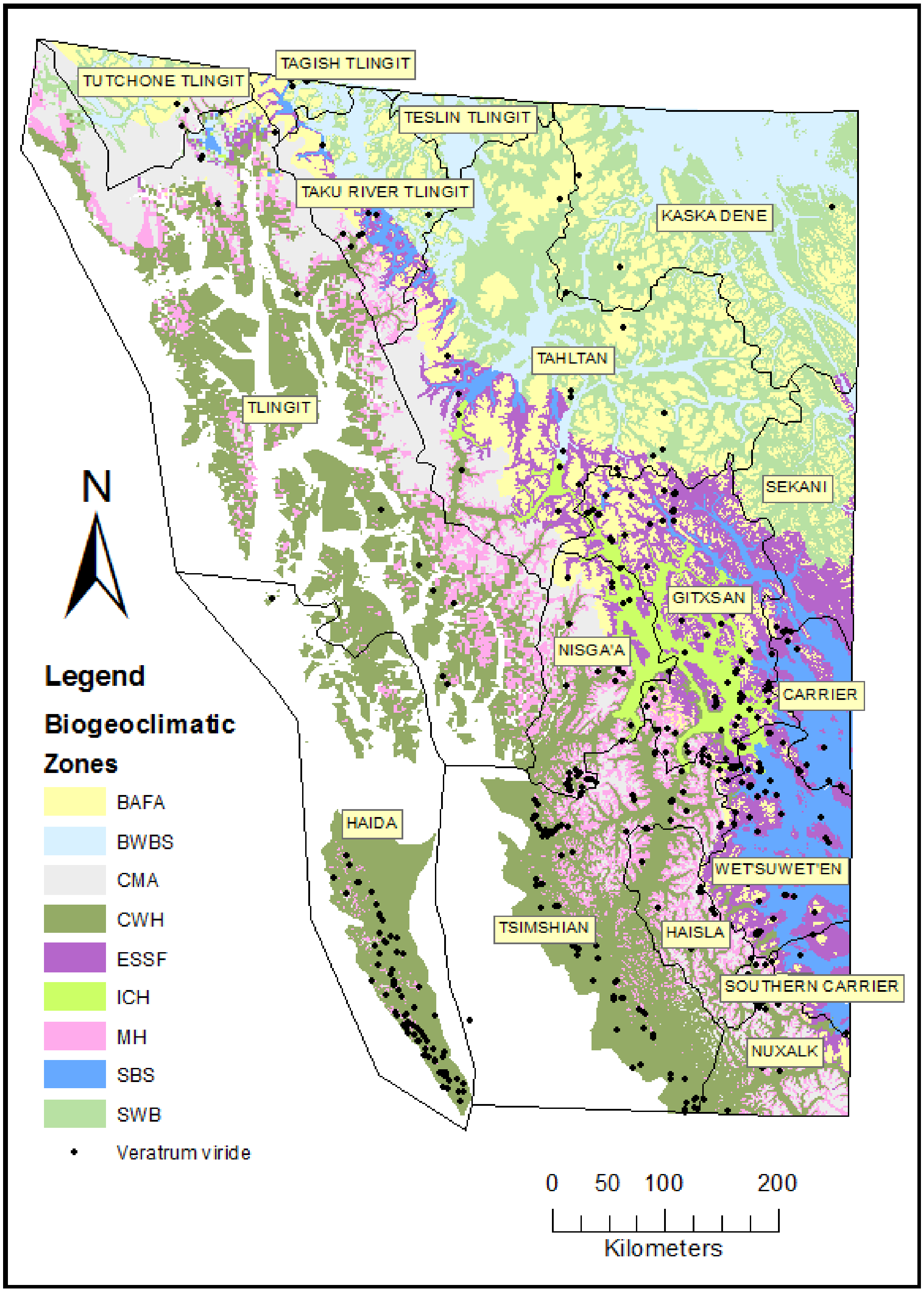

Figure 4.9. Distribution of *Veratrim viride* in the biogeoclimatic (BEC) zones and traditional territories of First Nations in northwestern BC and neighbouring Alaska.

4.5.4. *Individual Species Names*

Several species appear to have names that are either cognate[12] or borrowed words (Table 4.5). The words for crabapple, devil's club, soapberry, and yew are evidently cognate in Nisga'a, Gitxsan and Tsimshian. One of the several Nisga'a and Gitxsan words for black huckleberry are cognate, as is the Tsimshian and second Gitxsan words for this species. Words for soapberry (Nisga'a and Gitxsan **is,** Coast and Southern Tsimshian **as**) have the same origin or etymon[13] in the reconstructed ancestral language (Tarpent pers. comm. 2012). The Skidegate Haida (and Haisla) use of **as** or **is** indicates that they borrowed or adopted the word, most likely through trade. The Tlingit, Massett Haida and Alaska Haida words for this species, **xakwl'ee** (Tlingit) and **xagutl'iid** (Haida) most probably have the same origin. There appears to be a link between the words for hellebore in Nisga'a (**ts'iks**) and Tlingit (**s'iksh**), both of which refer to the whole plant.
The Nisga'a word **ts'iks** also occurs in Gitxsan, but there is also a Gitxsan word for the roots alone (**melgwaskw**), not retrieved in Nisga'a.

4.6. Discussion

Results suggest that although many of the same species are found within each territory, the relative abundance is variable (Table 4.3). This is not surprising considering that although the territories have some biogeoclimatic zones in common, there are differences in the extent of these zones on each territory (Table 4.2). Furthermore, although some species grow across a variety of biogeoclimatic zones, they often predominate in one particular zone (Table 4.4), which presumably supports conditions for optimal growth of that particular species. For example, *Malus fusca* (Figure 4.4) occurs predominantly in the mild coastal climate of the CWH but it is also found, to a lesser extent, in the ICH, MH and ESSF zones (see also Klinkenberg 2012). *Shepherdia canadensis* (Figure 4.5), on the other hand, is dominant in the interior zones (Klinka et al. 1989; Klinkenberg 2012) and is particularly common in the mid-Skeena area (Pojar and MacKinnon 1994).

[12] Cognate means that the words have the same ancestral origin.
[13] Etymon (plural etyma) is the single word in the original (or in this case, proto-) language from which a set of words is derived (Tarpent pers. comm. 2012).

Table 4.5. List of plant words in northwest native languages.[14,15]

Species	Common name	Nisga'a	Western Gitxsan	Tsimshian	Skidegate Haida	Massett Alaska Haida	Tlingit	Tahltan
Corylus cornuta	beaked hazelnut	*ts'ak'a tyaýtkw; maaýa tyay'tkw; ts'ak'a ts'inhlik'*	*sg̲an- ts'ek'*	*wineeym desx*$_1$	unknown	unknown	unknown	unknown
Malus fusca	Pacific crabapple	*milkst*	*milkst*	*moolks*	*k'ay; k'aay; k'aanhll; k'anhll; k'ayluus*	*k'ay, k'aay*$_2$ *k'ayanhla*$_2$*; k'ayánhl*^{3}	*x'ús' lingít x'áax'i, kaxwats'*	unknown
Oplopanax horridus	devil's club	*wa'ums*	*wa'umst*	*wooms*	*ts'iihllnjaaw ts'iihlinjaaw*	*ts'iihlanjaaw*	*s'áxt', áchta*	*khos chō, xwvs choo*
Shepherdia canadensis	soapberry	*'is*	*'is*	*'as*	*'as*	*xagutl'iid*$_2$*; xagwtl'íid*$_3$	*xákwl'ee, xákwlh'i, xákwtl'i*	*ishghohje, ishghoche*
Taxus brevifolia	Pacific yew	*haxwdakw*	*haxwdakw*	*sahakwdak*	*hlg̲iid*	*hlg̲iid*	*sáqs, s'ak̲s*	unknown
Vaccinium membranaceum	black huckleberry	*simmaaý*	*sim maa'y,*	*maay,*	none recorded	none recorded	unknown	*etsis tse dle, etsihcho*
Veratrum viride	false hellebore	*ts'iks*$_4$	*ts'iks*$_4$*, melgwasxw*$_5$	*huułens*	*gwaayk'ya gwaayk'yaa*$_5$	*gwaayk'aa*$_2$*, gwáayk'aa*$_3$	*s'íksh*$_5$	*needehi, nehdehi*

1.= Nuts in general; 2= Massett Haida; 3=Alaska Haida; 4 = whole plant; 5= root only

[14] Plant names are from: Nisga'a: McKay et al. 2001, Williams 2006, Tarpent 2011; Gitxsan: Hindle and Rigsby 1973; First Voices; Johnson 1997; Tsimshian: Anderson et al. (nd), Campbell 2005; Haida: Turner 2004; Tlingit: James Crippen (pers. comm. 2011), Naish and Story 1996; Tahltan: (Turner 2011).

[15] Nisga'a orthography was devised by Rigsby, subsequently refined by Tarpent (*in* McKay et al 1986); Gitxsan orthography was devised by Rigsby (Hindle and Rigsby 1973); Tsimshian orthography was devised by Dunn (1978); Tlingit orthography is the revised popular orthography devised by Constance Naish and Gillian Story (1996); Tahltan orthography was devied by Carter (1991 in Edōsdi 2012); Haida orthography was devised by the Skidegate Haida Immersion Program (1988).

Trade has always been an important economic and social activity amongst the First Nations considered in this study. The maps clearly show the differences in species distribution on the traditional territories of the Nisga'a, Gitxsan, Haida, Tahltan, Tsimshian and Tlingit First Nations. These differences, in turn, denote the potential for regional surpluses and demands, and hence indicate the probable directions of trade for particular plant products.

The species names (Table 4.5) show many similarities among Nisga'a, Gitxsan and Tsimshian languages. Cognate (or possibly borrowed) words exist between Nisga'a, Gitxsan and Tsimshian for crabapple, devil's club, soapberry and yew, between Nisga'a and Gitxsan for black huckleberry and false hellebore, and between Gitxsan and Tsimshian for black huckleberry.

The existence of these related terms is not surprising since the people live in such close proximity to one another and their languages are considered by linguists to be related (Rigsby and Kari 1987; Tarpent 1987). The relationship between Nisga'a and Gitxsan is described as that of "sister" languages, and their linguistic relationship to Coast Tsimshian as that of "cousins" (Rigsby and Kari 1987).

Nisga'a and Gitxsan share the same number of consonant and vowel sounds in their language, similar grammatical structure and spelling, and many words in common (Rigsby and Kari 1987; Tarpent 1997). The two languages differ in how their words sound and how they appear when written based on the sound differences (Rigsby and Kari 1987) (e.g., "**wa'ums"** in Nisga'a and "**wa'umst"** in Gitxsan for devil's club). The similar spelling but different sound of the Tsimshian word "**wooms"** reflects similarities commonly found between the languages with a common origin that have diverged from a common ancestral or proto-language. (Rigsby and Kari 1987).

Similarities and differences in the names for important plant species are consistent with the idea that the direction of trade goods and linguistic borrowing could be linked to relative species abundance. Many linguists agree that the borrowing of words frequently occurs for social-cultural, economic and geographical reasons (Campbell 2004; Hock 1991). Therefore, determining the existence of such connections as considered in this study can be helpful in understanding cultural and economic relationships between different nations and language groups (Turner and Loewen 1998; van Eijk 2003; Turner and Burton 2010).

4.6.1. *Individual Species Discussions and Implications for Trade*

4.6.1.1. *Corylus cornuta – beaked hazelnut*

Although hazelnut is widespread throughout the southern part of the province, (Turner 1995, 1997) it occurs only sporadically north of 52^{o} and west of the Rocky Mountains in the ICH (Klinkenberg 2012).

The map (Figure 4.3.) and species tallies show that it is predominantly found in the ICH (43%, Table 4.4) and that it is dominant on Gitxsan territory (95%, Table 4.3). In fact, there was so much hazelnut growing in the area that in 1868, when Thomas Hankin staked out a town site in the area adjacent to the native settlement of Gitwangaak, he named it Hazelton (Akrigg and Akrigg 1997).

The use of hazelnuts for food and for technological purposes is most widely recorded for the Gitxsan. They ate the nuts and also used the wood for hockey sticks and the branches for mats for kneeling and sleeping as well as for cleaning fish (Pojar and MacKinnon 1994; Turner 1998). Due to its sporadic distribution these nuts were not widely used by most of the other nations in the study.

Both the Nisga'a and Gitxsan ate the nuts (Chapter 2; Turner 1995, 1997) and both nations have names for this species. This Nisga'a words translate to: **tsak'a tyaýtkw** (dish of thunder)**, maaýa tyay'tkw** (berries of thunder)**, ts'ak'a ts'inhlik'** (squirrel's dish) (Chapter 2, Table 4.2). These words refer to the nut alone, not to the tree (Tarpent 2011).

The recorded Gitxsan word(s) for hazelnut **s<u>k</u>'ants'ak'** or **sgan-ts'ek' (**bush plate) (Table 4.3) likely refer to the shrub. In Gitxsan, **s<u>k</u>'an** or **sgan** translates to "bush", "wood" or "support" (Smith et al. 1997; Johnson 1999). Logically then, the hazelnut fruit itself was likely known as ts'ak' or ts'ek'. These words may refer to the tiny cup or bowl created when breaking the nut (Hindle and Rigsby 1973; Smith et al. 1997).

Given the presence of the word **ts'ak'** in Nisga'a and Gitxsan, those two words are likely cognates and the differences in the words for hazelnut reflect the linguistic and cultural differences between the Nisga'a and Gitxsan. Words for hazelnut that occur in southern nations are also commonly associated with thunder as well, possibly related to the noise that is made when the nuts are broken or chewed (Tarpent 2011).

The Tsimshian have a word for nuts in general, **wineeym desx**, and this translates to "food" (**wineey**) "for squirrels" (**desx**) (Anderson et al. n.d.; Turner and Thompson 2006). Since hazelnuts were probably the only nuts that originally grew on Tsimshian traditional territory, and some reports say that saplings of hazelnut were cultivated by the Tsimshian (McDonald 2003), it is likely that this term referred to hazelnuts. Alternatively, there could have been a term exclusively for hazelnuts that is not recorded in the literature consulted. A similar, alternate Nisga'a name for hazelnut was given by a Nisga'a collaborator who said hazelnuts were sometimes called **wineex ts'inhlik'** (squirrel food) because the squirrels sometimes would get the nuts before people could (Sigidimnak' Ẃii Ts'iksna'aks – Pauline Grandison 2008).

The Gitxsan were noted to harvest hazelnuts, bury them in the ground for 10 days to remove the husks, then shell them and eat them raw or alternatively raid the squirrel caches (Turner 1997). Since the nuts keep well, are nutritious and easily transported, it is somewhat surprising to see few references to its trade in the northwest. That is not to say that it wasn't occasionally consumed and exchanged at feasts or as part of other inter-regional transactions.

Transplanting of desired species was widely practiced by aboriginal people across North America (Blackburn and Anderson 1993; Black 1994; McDonald 2003, 2005b; Turner and Peacock 2005). It is therefore worth considering that the disjunct population of hazelnut found on Gitxsan territory (Pojar et al. 1994; Krajina et al. 1982) may have originated from transplanted hazelnut saplings or nuts traded from the south or east.

4.6.1.2. *Malus fusca* (Pacific crabapple)

Pacific crabapple is a moisture loving species found across a range of biogeoclimatic zones with the greatest abundance in the CWH (76%) (Figure 4.4, Table 4.4, Klinkenberg 2012). It is considered an indicator species of wet to very wet sites in the CWH (Klinka et al. 1989).

The fruit was used as a stored winter food by the Nisga'a and the neighbouring Tsimshian, Gitxsan, Haida and Tlingit. It was abundant enough on each territory that crabapples were considered a staple winter food as well as an item of trade and prestigious gifting. Crabapples are the most frequently mentioned fruit in Tsimshian stories (Turner 1995).

The fruits were prepared for storage in similar ways across the territories by cooking them slightly and mixing them with grease (Chapter 2; People of 'Ksan 1980; Emmons 1991; Turner 1995, 1997, 2004; Turner and Thompson 2006). Such similarities suggest that the trading of knowledge and "recipes" was practiced or that the practices are ancient, known to proto-Tsimshianic peoples. The Nisga'a often ate crabapples in the winter mixed with snow and eulachon grease as an ice-cream like treat (Turner 1995; Chapter 2). There are no records of the Tahltan harvesting or using crabapple, and no name for this species could be found in the Tahltan literature reviewed.

The existence of words for crabapple listed in Table 4.5 suggests that all Haida words and Tlingit names for crabapple are different from one another, and both nations have words that are different from the Nisga'a, Gitxsan and Tsimshian names. The Haida have several terms for crabapple that are interchangeable between Skidegate, Masset and Alaska peoples. The word **k'áywahl** translates "to be sour" in Haida.

The Nisga'a and Gitxsan words for crabapple are the same (**milkst**) and the Tsimshian word, **moolks**, is cognate. In Nisga'a **milksa<u>x</u>** is the word for "sour" and in Tsimshian it is **moolksax** (McKay et al. 2001). The descriptive naming of the fruit parallels the English common name (Little et al. 1988).

Crabapple wood was used for technological purposes by the Nisga'a and other Northwest peoples to make fishing hooks and other implements (Chapter 2; Turner 1998, 2004). The Gitxsan and Haida used the bark for medicinal purposes (Smith 1929; Turner 2004).

Crabapple was often cultivated in the Northwest, typically around village sites, to ensure a consistent supply of the highly valued fruit and wood (McDonald 2005b; Moss 2005; Turner and Peacock 2005; Turner and Thompson 2006). The Tsimshian recognized several varieties of crabapple, each with different names (Turner and Thompson 2006).

4.6.1.3. *Oplopanax horridus* (devil's club)

Devil's club is found on all the territories in the study region, but is evidently most dominant in the ICH on Gitxsan traditional territory (36%) and in the CWH on Tsimshian territory (28%) (Figure 4.5, Table 4.3). Results also show that collections were almost equally distributed in the ICH and CWH (43%) (Table 4.4). Devil's club is found in all biogeoclimatic zones, with its province-wide modal abundance in the ICH and its next most abundant representation in the CWH (Klinkenberg 2012). It is considered an indicator species of wet to very wet conditions in the CWH (Klinka et al. 1989) and it is diagnostic of nutrient-rich, wet sites in all treed biogeoclimatic zones south of the boreal region (Banner et al. 1993).

It might be expected that the data would show that there is more devil's club on Haida territory because their traditional territory is almost exclusively CWH (96%) (Table 4.2). However, there are more collections of this species on Tsimshian territory (Table 4.3), probably reflecting better access and more complete sampling on the mainland that constitutes the CWH zone on Tsimshian territory, compared to the islands of Haida Gwaii and southern Alaska.

Devil's club was and still is used for medicinal and spiritual purposes by all the nations included in this study, and people prepared the stems and/or roots in similar ways for medicinal use (Smith 1929; Emmons 1991; Johnson 2006; Turner 2004; Turner and Thompson 2004). In fact, it is widely used by more than 38 linguistic groups across northwestern North America for over 34 different purposes (Lantz et al. 2004). All Nisga'a collaborators were familiar with the name and with many uses for this species. Many people use it today as medicine for specific illnesses, as a general tonic and for spiritual purposes (Chapter 2; Nisga'a Tribal Council 1995, Vol. IV). General medicinal uses are summarized in Chapter 4 and in Lantz et al. (2004). There is limited information on its use for food or technological purposes. The Tlingit ate the early spring shoots for food and burned the whole plant as material for dye (Greene 1896; Osgood 1937) and the stems were used for fish lures and octopus sticks by the Haida and the Nitinaht of Vancouver Island (Turner et al. 1983; Turner 1998; 2004).

The Nisga'a, Gitxsan and Tsimshian have cognate words for devil's club: **wa'ums** (in Nisga'a), **wa'umst** (in Gitxsan), and **wooms** (in Tsimshian). The Haida have the same word in all dialects: **ts'iihlanjaaw** (or variants). The word **ts'iihl** translates to "gambling stick" in Haida (Turner 2004). It is unclear if these sticks would have been used in playing the game or if they were used as lucky charms when gambling or both (Turner 2004).

The Tlingit have two words for devil's club (**s'axt'** and **áchta**) which may be regional variations of the same word. Similarly, the Tahltan have two words (**khos chö** and **xwvs choo**) which are also likely regional variations of the same word. This word translates to "big spine" (or thorn), a general term in Athapaskan languages, also sometimes applied to wild rose (Turner pers. comm. 2012).

Despite the similarity in use, the Haida, Tlingit and Tahltan clearly have developed their own terms for devil's club. The fact that this species exists on all their territories but that the names are different could indicate that its use was fully engrained in each culture independent of their contact with each other, and that each nation had their own term for what was considered a powerful and important plant. However, since medicinal preparation and uses are so similar, it is likely that the many uses for this plant were frequently discussed and refined during trade or other types of cultural exchange.

4.6.1.4. *Shepherdia canadensis* (soapberry)

Soapberry is primarily an interior species (Figure 4.6), most abundant in the BWBS (41%) and the ICH (29%), with the proportions collected in the SBS, SWB, ESSF, BAFA and MH ranging from 1% to 9% (Table 4.4). The fact that no collections have been made in the CWH suggests that the desirable fruit of this species would not have been locally available to coastal communities. However, the data are not consistent with those reported in E-Flora BC, which shows it as present in all biogeoclimatic zones with greatest abundance in the SBS followed by BWBS > ESSF > ICH. This difference may be due to the fact that the modal distribution reported in E-Flora is based on its provincewide distribution, rather than the distribution for the study area alone. Alternatively, in the study area, there may have less sampling in the SBS, BWBS and ESSF zones.

Soapberries are widely used by First Peoples in British Columbia and adjacent US states to the south (Washington, Oregon and Montana) for food and medicinal purposes

(Kuhnlein and Turner 1991; Turner and Burton 2010). In these areas, the berries are primarily made into a special whipped confection traditionally served at feasts and on festive occasions. Names for soapberry and activities relating to the use of soapberry exist in most languages in northwestern North America. Many of the terms for soapberry are linguistically similar, not only within language families but across families in several cases.

Such similarities can be seen in the present study where the names are cognate words in Nisga'a, Gitxsan and Tsimshian (**'is** in Nisga'a and Gitxsan, **'as** in Tsimshian). A form of the same word, **'as,** was borrowed by the Skidegate Haida. The word **'is** possibly originated with the Gitxsan, since they are most often credited with using soapberries as a trade item because of their abundance on Gitxsan traditional territory (Gottesfeld 1994; Turner 2004; Turner and Thompson 2006; Sim'oogit Gadim <u>G</u>aldoo'o 2008; Sigidimna<u>k</u>' K'igapks 2008). The name for soapberry in the Massett dialect of Haida (**xagutl'iid**), as well as the Alaska Haida name, is evidently derived from the Tlingit term **xákwl'ee** **(**Naish and Story 1996), suggesting that the Masset and Alaska Haida had different trade routes for soapberries than that of the Skidegate Haida (Table 4.5; Turner and Burton 2010).

The Tahltan are reported to have the highest proportion of soapberry (46%) on their traditional territory (Table 4.3, Figure 4.6). There are few references to trade with their Nisga'a neighbours. In fact, they were frequently in conflict with the Nisga'a (Emmons 1911), so peaceful trade for soapberry or any other product may not have been well established. However, the Tahltan words for soapberry is **ishghohje** (**ghohje** translates to 'berry') so the morpheme **'ish'** may have been borrowed from the Nisga'a (Brown pers. comm. 2012).

The Tahltan traded goods (mostly furs) with the Tlingit (Emmons 1911) but trade of soapberries is not specifically mentioned. Inland Tlingit territories have a fair amount of soapberry (19%), which they may have traded to the Coastal Tlingit. The Tlingit also claimed the territory along the Stikine River from below Glenora to Telegraph Creek (Emmons 1911), a distance of about 24 km, although this area is clearly shown on Emmons map as Tahltan territory. Since the Tlingit did claim this area, their access to soapberry was greater than what is recorded in Table 4.3.

The Massett Haida, who had no soapberry on their traditional territory, traded with the Tlingit for soapberries (Turner 2004). The northern Haida probably traded soapberries from the Tlingit (Figure 4.6) (Thornton 1999). Since soapberry does not grow abundantly in coastal areas at present, it is likely that all soapberries traded by the Tlingit ultimately came from such inland sources. The coastal Tlingit tried to transplant soapberry bushes although this practice may not be an ancient one (Thornton 1999).

Further evidence for trade of soapberries between the Tlingit and Haida can be seen in their terms. The Tlingit word for soapberry is **xákwl'ee**, and the Massett and Alaska Haida word is **xagutl'iid**. These are obviously similar words, probably borrowed from the Tlingit into Haida, along with the traded berries.

Attributing the direction of borrowing from Tlingit to Haida is based on the occurrence of the ejective fricative[16] **l'** in the Tlingit word. Tlingit is the only language in North America that uses ejective fricatives. The Haida do not have this sound in their language, but accommodate it with an ejective affricates **tl'** which does occur in their language. In Tlingit **l'** and **tl'** are two different sounds. Therefore, if an ejective fricative occurs in a Tlingit word, it likely originated from the Tlingit because they would probably not borrow a word and change a **tl'** to a **l'** sound (Crippen 2012, pers. comm.).

4.6.1.5. *Taxus brevifolia* (Pacific yew)

A breakthrough in the treatment of certain forms of breast cancer and ovarian cancer occurred within the last three decades using the taxanes[17] from the bark of *Taxus*

[16] An ejective fricative is one of the rarest types of sounds in human languages (Crippen pers. comm. 2012). It is produced without vibrations of the vocal cords (voiceless) where air is forced out by pumping the glottis upward (ejective) and escapes through the mouth. The sound produced is articulated with the lower lips and upper teeth (i.e., it is labiodental, such as the "f" or "v" in English).

Tlingit's ejective fricatives are unitary sounds. Some languages get their ejective sounds by combining a sound with a glottal stop. Tlingit always makes a distinction between sequences of glottal stop and some other consonant versus real ejective sounds. So if some other language has a sequence of consonant plus a glottal stop then Tlingit speakers aren't going to mishear that as an ejective (Crippen pers. comm. 2012). Other ejective sounds occur in languages (e.g., ejective affricates). These sounds are produced by first stopping airflow completely then allowing it to flow through a constricted space. An alveolar lateral ejective affricate, which occurs in Nisga'a is a voiceless sound produced by directing the air over the side of the tongue (lateral consonant), allowing air to escape through the mouth (oral consonant). The sound is produced by stopping the airflow entirely, then permitting the air to flow through a constricted channel. Ejectives occur in Nisga'a as in the word **ts'iks** (false hellebore) or **t'ipyees** (stonecrop).

[17] A taxane is a type of drug that blocks cell growth by stopping mitosis (cell division). Taxanes interfere with microtubules (cellular structures that help move chromosomes during mitosis). They are used to treat cancer (http://www.cancer.gov/dictionary?cdrid=46138).

brevifolia. The drug was produced as Taxol® and was patented by Bristol-Meyers Squibb; the yew bark to produce it was commercially harvested on a large scale, without consideration of its importance to First Nations (Turner 2004). The conservation status of this species in BC today is "yellow"[18], meaning that it is of special concern, partly because of widespread commercial exploitation in recent years (Hartzell 1990). The active constituent useful in cancer treatment is now semi-synthesized from yew needles of *Taxus baccata L.* (European yew) and *Taxus wallichiana*[19] Zucc. (Himalayan yew) and widely used for such treatment (Jennewein and Croteau 2001; Cragg and Newman 2005).

Long before its published use as a cancer treatment, the bark of Pacific yew was highly treasured and widely used by the nations in this study for a variety of medicinal, technological and spiritual purposes (Turner 2004; Chapter 2; Sim'oogit Gadim Galdoo'o 2008; Jeff Benson 2008; Sigidimnak' Hlgu Wilksithlgum Maaksgum Hlbin – Emma Nyce 2008; Barbara Wilson pers. comm. 2008). Yew remains highly regarded and widely used across the study area, often mixed with other plant medicines. Such preparations, ingredients and proportions are considered proprietary by the people who hold the knowledge. In fact during the course of this study a Haida elder brought some yew bark to the Nass Valley and shared a preparation technique, which she asked people not to share further.

Technological use of yew wood by the Nisga'a, Gitxsan, Tsimshian and Haida include making bows, arrows, canoe paddles, fish hooks and other implements (Chapter 2; Nisga'a Tribal Council 1995, Vol. IV; Smith et al. 1997; Turner 2004; Turner and Thompson 2006).

This species is most dominant on Haida territory, which includes 90% of the documented collections or observations, predominantly in the CWH and borderline CWH/MH zones (Figure 4.6, Table 4.3). Its dominance in this ecosystem is different from that reported in E-flora BC, which describes its modal distribution in the ICH followed in order by the CWH > ESSF > AT > MH (Klinkenberg 2012), although an examination of the E-flora maps and Klinka et al. (1998) shows this ICH concentration to

[18] Yellow status includes species that are apparently secure and not at risk of extinction. Yellow-listed species may have Red- or Blue-listed subspecies.
[19] Synonymous with *Taxus yunnanensis* W.C.Cheng & L.K.Fu

be primarily in the interior Selkirk and Cariboo Mountains, not the northwestern ICH subzones.

Yew does predominate on Haida traditional territory, but its occurrence there is considered rare (Viereck and Little 1972). It seems that it was, and still is, highly valued. It has been suggested that in the past, the northernmost expansion of the Haida is almost identical to the coincident range of yew and western redcedar, suggesting that people wanted relatively easy access to these two important species (Norton 1981). Alternatively, it is possible that this highly valued species was transplanted to locations near village sites.

Yew is also highly valued by the Nisga'a and considered rare in the Nass Valley. Sim'oogit Gadim Galdoo'o (2008) said that his grandfather would go way up into the mountains near the coast to find yew, after performing a spiritual cleansing with **wa'ums** (devil's club) to bring him luck in finding this rare species. It is not evidently found on Gitxsan territory but the Gitxsan people also valued it for technological purposes and obtained it in trade from the Tsimshian of Fort Simpson (Smith et al. 1997). Herbarium collections from Tlingit territory[20] show that it is rare or marginally distributed there (Klinkenberg 2012).

The different names for yew in various languages reflect one of its most important technological uses rather than its medicinal use (Table 4.5). The word **haxwdakw** in Nisga'a and Gitxsan, and its variation, **sahakwdak,** in Tsimshian, figuratively means "bow." In Nisga'a and Gitxsan the literal translation is "instrument for shooting," the prefix **ha** or Tsimshian **sa** meaning "instrument for" and the verb **xwdakw** meaning "to shoot" with a bow or a gun (Tarpent 2011).

Several other languages of the coast also have names for yew referring to a bow or to shooting (Tarpent 2011). The Haida word **hlgiid** translates to "bow" as well, and in the past the Haida too made bows from yew because of its strength and flexibility. (Smith et al. 1997; Turner 2004; Turner and Thompson 2006). Whether the Gitxsan traded for bows or yew wood with the Tsimshian, Haida or Nisga'a is not certain but their word for this species is cognate with the Nisga'a and Tsimshian term. As noted, yew is scattered in coastal Tlingit territory, but the name **s'aks** (c.f. sucks) also means bow (Emmons 1991).

[20] not shown on the species map

According to James Crippen (pers. comm. 2012) all old examples of Tlingit bows in museums are made of yew wood.

The words for yew are cognate for Nisga'a, Gitxsan and Tsimshian and are distinct for Haida and Tlingit. However, the word in all languages translates to "bow," reflecting its common use by all nations in this study.

4.6.1.6. *Vaccinium membranaceum* (black huckleberry)

The distribution of black huckleberry represented by the collections data (Figure 4.8, Tables 4.3 and 4.4) is consistent with that reported in the literature. It is primarily a mid- to high-elevation species, more dominant in the interior and not found on Haida traditional territory (Klinka et al. 1989; Douglas et al. 1999a). The results with respect to distribution and naming are somewhat confusing for this species. It is found predominantly on Gitxsan territory (63%) but then next on Tsimshian territory (14%) rather than in the more inland areas of the Nisga'a or Tahltan (11%) (Table 4.3). These distribution results more probably reflect access differences for plot sampling and voucher collections rather than species distribution.

The names for black huckleberry (Table 4.5) also suggest that the distribution data may not be not truly representative. The Nisga'a and Gitxsan words for black huckleberry, **simmaaý** in Nisga'a and **sim maa'y** in Gitxsan, are cognate terms and they translate to "real or true berry" (Tarpent 2011). Such a word suggests that black huckleberry is the most preferred or highly prized berry species for both the Nisga'a and Gitxsan.

The Tsimshian, whose traditional territory is shown to have the second highest distribution of black huckleberry, also have a species they call **smmaay** but this name generally refers to the species *Vaccinium alaskense* Howel not necessarily to black huckleberry. The Tsimshin simply call black huckleberry, **maaý,** which is their general term for berry (Turner and Thompson 2006). The use of such a general term may mean black huckleberry is considered "the" berry of choice. However, if this is the case it is difficult to say why *Vaccinium alaskense* is called **smmaaý** (which presumably translates to real berry). E-Flora data show Alaska blueberry occurs in six of the nine biogeoclimatic zones found in the study area and reports its modal distribution across the province to be in the CWH (Klinkenberg 2012). Since the CWH is the dominant biogeoclimatic on Tsimshian territory (73%) (Table 4.4), the Tsimshian likely had this species in abundance as well on their territory.

The Tlingit also have a name for a treasured berry, **naanyaa kanat'aayí**, which translates to “big blueberry.” This species, however, is recorded as oval-leaf blueberry, *Vaccinium ovalifolim* (Emmons 1991). The information for the Tlingit use of black huckleberry is sparse and confusing in the literature. Black huckleberry does occur on Tlingit territory but its occurrence is sporadic, representing only 1% of the documented collections or observations (Table 4.3). Emmons (1991) notes that the berries were used for dye. This single technological use of a delicious berry may reflect its infrequency on Tlingit territory rather than its local importance or desirability as a food.

The existence of a Tlingit word for black huckleberry is also somewhat confusing. Emmons (1991) refers to **see-koch koo** as huckleberry or mountain blueberry and he notes this to be *Vaccinium caespitosum* Michx. (commonly called “bilberry” or “dwarf blueberry”). He also notes that berries of *Vaccinium membranaceum* were used for dye but does not give a Tlingit name for this species.

Emmons, as an anthropologist not a botanist, may have confused the different *Vaccinium* species, as they are difficult to distinguish. All that can be concluded from the available Tlingit literature is that black huckleberry existed on Tlingit territory, but it was not as abundant and evidently not as important to the Tlingit as it was to the Nisga’a and Gitxsan and Tsimshian.

The Tahltan territory has widespread representation of black huckleberry, making up 11% of documented occurrences (Figure 4.8, Table 4.3). They call this species **etsis tse dle** (small blueberry) and **etsihcho** (Table 4.5). They perhaps traded it to the Tlingit on occasion, who didn’t have that particular species in abundance (Emmons 1911; Albright 1982).

The Haida don’t have a particular word for black huckleberry, presumably because it was not found on their traditional territory. Since they have access to many other kinds of berries, they evidently did not routinely trade for this species.

The distribution of the different *Vaccinium* (blueberry or huckleberry) species is unique to each territory. All of the nations in this study had good access to one or more of the different kinds of blueberries and other berry species on their traditional territory to dry for winter use (People of 'Ksan 1980; Albright 1982; Emmons 1991; Boston et al. 1996; Nisga'a Tribal Council 1995, Vol. IV; Turner 2004; Turner and Thompson 2006; Sigidimnak' K'igapks 2008). Therefore, trade and perhaps the borrowing of terms for black huckleberry may not have been particularly important. However, that is not to say that berry cakes made entirely of black huckleberry or that included a combination of berry species were not ever traded or presented as gifts.

4.6.1.7. *Veratrum viride* (false hellebore)

The documented distribution of false hellebore (Figure 4.9) is somewhat different than that reported in the literature for BC as a whole, in that collections indicated that it is most abundant in the study area in the CWH (47%), followed by the MH (19%), and then the ESSF (13%; Table 4.4), whereas its modal distribution across BC is reported by E-Flora as being most abundant in the ESSF followed by the CWH (Klinkenberg 2012). Nonetheless, its abundance in the CWH is consistent with its description as a species of rich moist sites, with a distribution across all of the biogeoclimatic zones from lowland to alpine locations (Klinka et al. 1989; Douglas et al. 2001).

The roots of false hellebore were the part of the plant used in similar manners for both medicinal and spiritual purposes by all of the nations in this study as well as by other peoples. Medicinal use was primarily external, although there was some limited and cautious internal use (Emmons 1991; Sigidimnak' Noxs Ẃeen – Peggy Nyce 2008). It was considered a powerful plant to be prepared and used with great care (Emmons 1991; Compton 1993; Kari 1995; Nisga'a Tribal Council 1995, Vol. IV; Smith et al. 1997; Turner 2004; Johnson 2006). In fact, it is so powerful and dangerous that the Dena'ina people (of southwestern Alaska) developed a list of rules for handling this species (Kari 1995). The Nisga'a continue to prepare medicine from the roots of false hellebore and respect the powerful nature of the plant (Sigidimnak' K'igapks – Alice Azak 2008; Sim'oogit Gadim Galdoo'o – Charles Alexander 2008).

The words retrieved for false hellebore sometimes describe the whole plant (e.g., **ts'iks** in Nisga'a and Gitxsan) and the Tlingit word **s'íksh**, or just the roots (**gwaayk'ya** in Haida, **melgasxw** in Gitxsan). The second Gitxsan word for false hellebore,

melgwasxw, translates to “to burn something” (Smith et al. 1997) and, in fact, this root was often burned in medicinal preparations or used as a smudge for spiritual purposes. It is interesting and important to note that the cognate Nisga’a word for “to burn something” is **malkwdi** (McKay et al. 1986). It is possible that **malkwdi** or a word similar to it may have been used to denote the roots of **ts’iks** but was neither reported by the collaborators nor noted in the literature consulted, so this is just speculation.

The Nisga’a (**ts’iks**) and Tlingit (**s'iksh)** names for false hellebore are clearly related and the term was likely borrowed from one language to the other. Linguists suggest that **ts’iks** is an adaptation of Tlingit **s'iksh** because there is no sound **s'** in Nisga’a, so Nisga’a speakers interpret the Tlingit ejective fricative sound **s'** as their **ts'**. If the Tlingit had adopted the word from the Nisga’a, they would have retained the initial **ts**' which does exist in the Tlingit language, not changed **ts'** to **s'** (James Crippen pers. comm 2012).

Since false hellebore appears to be more abundant on Nisga’a territory (11%) than on Tlingit territory (5%) (Figure 4.9, Table 4.3) it cannot be argued that the Nisga’a adopted the Tlingit word when they traded the plant or roots because they didn’t have an adequate supply of their own. Nisga’a Chief Gitlax̱t’aamiks (Peter Nisyok, aged 91 when interviewed in the 1920s) recalled that there used to be much Tlingit mixed in with the Nisga’a language in the earlier days (Barbeau 1927b, BF 106:33 pt. 2), so it is more likely that the term for **ts’iks** was one of the many Tlingit words adopted into the Nisga’a language during their frequent contact and trade.

The Tahltan names for false hellebore are **needehi** and/or **nehdehi**. These terms are possibly cognate with the Upper and Inland Dena’ina name for the whole plant, **hdeldeh’**. The Dena’ina language is also part of the Athapaskan language family. This Dena’ina name translates in English to “the thing that makes you red” although it is not clear if the red refers to some part of the plant or what happens to you after you use the medicine (Boraas pers. comm. 2012).

The Tsimshian word for false hellebore, **huułens**, is very different from the Nisga’a and Gitxsan words. The Southern Tsimshian use a cognate **hú.łn̥s**. An ancient use of this word occurs in a story which describes a kidnapped Nisga’a women using the pulverized roots of false hellebore (“**hoolens**”) to blind the Haida chief who was her husband (Barbeau 1927c, BF 106:59 pt. 3). **Huułens** means both false hellebore and poison root in Tsimshian. **Huus** is the term for root in Tsimshian (Anderson et al. n.d.). So it possible that a form of **łens** might translate to "poison" in Tsimshian but this has not been confirmed.

The Haida apparently imported false hellebore from the Tsimshian even though the plant is common on their territory, suggesting perhaps a preference for the power of the plant on Tsimshian territory (Turner 2004).

There is evidence for a complicated development and exchange of terms associated with hellebore, and some material trade as well. Based on the plant distribution data and plant names in this study, it is evident that both the terms for false hellebore, the roots themselves and preparation methods were exchanged between some nations in this study, but details concerning the direction of trade and terminology are not well understood.

4.7. Conclusion

Widespread trade among Northwest Coastal nations, as well as trade between coastal people and interior peoples, is well documented in the literature (Manson 1832; People of 'Ksan 1980; Nisga'a Tribal Council 1995; Turner and Loewen 1998; Turner 2004; Daly 2005; Johnson 2006). Trade allowed access to foods, materials and medicines not abundant in a particular area to be exchanged for those abundant or of superior quality in the territories of another nation. Such exchange also facilitated the development of new ideas for preparation and use and expanded horizons, while offering flexibility in coping with both environmental and social change. At the same time, it strengthened the development of cultural distinctiveness and pride.

Northwest Coastal First Nations trade in plant materials, and the borrowing of associated names, can be summarized as follows:

- Beaked hazelnut: this species was not widely distributed in the study area and was most dominant on Gitxsan territory. One of the Nisga'a names given to it (**ts'ak'a tyaýtkw –** "dish of thunder") and Gitxsan names (variants of **sk̲'ants'ak')** may be related to the shape of the nutshell, as a small bowl. It was likely not widely used by the Haida, Tlingit or Tahltan, with no names retrieved for it and little or no record of its use by these peoples.

- Pacific crabapple: crabapples, present to some extent on six of the seven study territories, were used as a food and stored for winter. Names for this species (variants of **milkst**) are cognate in Nisga'a, Tsimshian and Gitxsan but there is no other evidence of the borrowing of terms into the other languages, although crabapples were a common trade or gift item.
- Devil's club: this species is found throughout the Northwest and was widely used for medicinal and spiritual purposes by all the study nations. Cognate terms (variants of **wa'ums**), exist among Nisga'a, Gitxsan and Tsimshian suggesting a long term use of this species. Haida, Tlingit and Tahltan each have their own unique terms for it, perhaps reflecting proprietary aspects to its preparation and use. On the other hand, similar uses and preparation could also suggest a sharing of ideas.
- Soapberry: these berries were frequently traded from Gitxsan to Tsimshian and Nisga'a. Their names for soapberries (variants of **is**) are cognate. Soapberries do not grow on Haida Gwaii. The Skidegate Haida traded the berries and adopted the name directly or indirectly from the Tsimshian. The Massett Haida evidently traded berries with the Tlingit and adopted their term for the berries (**xákwl'ee)**. It has not yet determined if the Tahltan words (**ishghohje**) is related to the Gitxsan, Nisga'a or Tsimshian terms.
- Pacific yew: this highly valued species which predominates on Haida traditional territory may have been an important item of trade from Haida to Tsimshian, Nisga'a, and Tlingit and others, possibly for goods such as soapberries that were highly valued by all First Nations (Turner and Burton 2010). The terms for yew (**haxwdakw)** are cognate in Nisga'a, Gitxsan and Tsimshian and not related between Haida and Tlingit. No term was retrieved for the Tahltan. The names universally reflect a widespread technological use for making bows.
- Black huckleberry: this species has cognate terms in Nisga'a and Gitxsan and its name (variants of **simmaaý –** "true berry"**)** reflects that it was and still is a highly valued food species. There is no widespread evidence of trade for this particular species, although berries in general were traded (e.g., soapberry). The Tsimshian

term may reflect their esteem for this berry as well if their name for it, (**maaý**), is interpreted to mean “the” berry.

- False hellebore: this species was highly regarded by all nations as a potent but potentially dangerous medicine and a plant with spiritual powers. The Nisga’a word (**ts’iks**) and one of the Gitxsan words are the same. There is evidence of adoption of the word from Tlingit (**s'íksh**) to Nisga’a although data reveals that this species was more abundant on Nisga’a territory. The Tsimshian word (**huułens**) is completely different from that of the Nisga’a or Gitxsan. The Tahltan word (**needehi)** is possibly cognate with the term **hdeldeh’** used by the Dena’ina (another Athapaskan speaking people), which translates to “the thing that makes you red.”

All well documented instances of recurrent trade clearly support the hypothesis that such enterprises were primarily undertaken from areas (and hence nations) of greater abundance of a particular plant product to areas of low abundance. Plant names were sometimes adopted along with the trade goods. Conversely, plant species that were abundant and easily accessible in an area (a group’s traditional territory) typically had unique or cognate indigenous names and were not usually traded. However, gifts of highly prized species such as soapberries or crabapples were frequently exchanged.

Trade between nations occurred regularly but trading partners and trade goods varied from year to year, depending on availability of particular species, as well as current alliances, marriages, the paying off of debts, and conflict over land (Nisga’a Tribal Council 1995, Vol. IV; Sterrit et al. 1998; Beynon 2000; Marsden 2000). For example, the Tahltan were reportedly frequently in conflict with other nations (Emmons 1991) and may have been excluded from trading at certain times, depending upon the state of conflict at any particular time. However, if they had a product in abundance that was needed by a trading partner, conflicts would likely have been, at least temporarily, resolved so that trade could peacefully occur (Emmons 1911). For example, with no access to coastal resources, but having highly valued furs, the Tahltan at times traded with the Coastal Tlingit (Emmons 1911).

The species distribution maps presented here suggests a definite link between the scarcity of a plant product within a particular territory and the trade for that product, as known from ethnographic accounts (e.g., trade for soapberry). There remain questions as to what determined which species and products were highly valued for trade and why some plant products were traded even though they may have been abundantly available to everyone on their own territory (as in the case of the Haida importing false hellebore from the Tsimshian).

It would be interesting to develop distribution maps for other species, especially the important conifers such as *Thuja plicata* (western redcedar), *Chamaecyparis nootkatensis* (yellow cedar), *Tsuga heterophylla* (western hemlock) and *Pseudotsuga menziesii* (Douglas-fir) to look for other potential trading patterns based on differential species abundance. In addition, linking the trade of plant products to the availability of furs, fish and other products might provide further insight into trading patterns and regional economies.

Potential links between adopting or borrowing words associated with regularly traded goods are not readily seen when comparing words for the sample species and their corresponding plant distribution. It is generally recognized that similar sounds and word structures frequently occur between neighbouring languages even when they are not genetically related, likely due to the influence exerted by one language over another (Sapir 1963) and that the borrowing of terms is a common linguistic practice (Campbell 2004). Such exchanges of sounds and terms were likely a result of frequent contact during trade and the resulting alliances that occurred as a result of such trade.

Results do suggest that there was consistently a relationship between species names in the linguistically related languages of the Nisga'a, Gitxsan and Tsimshian, known to share a common proto-language (Rigsby and Kari 1987; Tarpent 1997; Halpin and Anderson 1990).

This research provides important insights into the direction of trade for several species and the possible adoption of words linked to such trade. It can be concluded that the adoption of words from one language to another is not as straightforward as the trade for plants products. For example, the Haida, who had no soapberries on their territory, traded for soapberry with the Gitxsan and Nisga'a and Tsimshian and they adopted the word into their vocabulary (Figure 4.6., Table 4.4, Table 4.5). This research shows that the borrowing of words did occur between Nations not linguistically related (e.g., Nisga'a **ts'iks** and Tlingit **s'iksh** for false hellebore). The exchange of names here does not seem to be dependent on species abundance, as false hellebore is evidently more abundant on Nisga'a territory than on Tlingit territory (Figure 4.9, Table 4.4). Consequently, not all patterns of trade nor the borrowing of terminology can be linked to species abundance.

This research raises questions about trade based on plant distributions and the adoption of words from one language to another based on species abundance. It appears that trade for any species did not necessarily include the adoption of the term for that species. When being adopted into a recipient language, a word is not usually adopted into the language as is. Rather, the sounds, phonemes, morphemes, syntax and semantics are all borrowed and adapted to the donor language so that a loanword can change eventually to become part of a recipient language (Campbell 2004). However, the fact that the borrowing of words between cultures did exist lends support to the importance of trade and cultural exchange. The adaptation of the word into the recipient language highlights the importance of maintaining distinctive culture, language and traditions.

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Chapter 5

Prospects for Sustainability of *Oplopanax horridus* (Wa'ums), an Important Ethnobotanical Resource in the Nass Valley

And the girl asked: "Who are you who is so good to us?"
The young man replied: "I have been sent by my father who is the Chief of ***Wa'ums*** *… he heard the crying of the old lady and sent me to teach you the way of* ***wa'ums*** *… which you find all over this country … it is really a valuable plant and has many uses which will bring good fortune to all that use it … as well as good health …* (Charles Ryan 1929).

This is the most used plant of our nation (Sim'oogit Hleek – Dr. Joesph Gosnell August 2008).

There are certain ones you are supposed to look for and they have to be straight and the longer the better. You are supposed to thank the creator before you get it ... get down and talk to the plant before you take it and [say] *what you're going to use it for* (Sigidimnak' Hagwilook'am saxwhl giis – Irene Seguin 2008).

A guy, years ago, it was in the early 1900's, I guess ... a guy went into a bush on the island and he found one huge ***wa'ums****, about a foot across. Yeah, the old man knew about it and he didn't want to leave it and he only had a knife and he sat there all day cutting it with a knife. He didn't leave it and he was really lucky after that because* ***wa'ums*** *brings you luck* (Sim'oogit Ni'is Naganuus – Steven Doolan 2008).

5.1 Introduction

Oplopanax horridus (Sm.) Miq. (devil's club)[1] has long been an important plant to First Nations people in northwestern North America wherever it is found (Smith 1929; Smith et al. 1973; People of 'Ksan 1980; Turner 1982, 2004; Gottesfeld and Anderson 1988; Gottesfeld 1992, 1994; Johnson 2000; Lantz 2001; Moerman 2002, 2009; Lantz et al. 2004). It was, and continues to be, used for medicinal and spiritual purposes. More than 34 broad categories of medicinal use and eight categories of spiritual use of devil's club have been distinguished from across 38 linguistic groups of northwestern North America (Turner 1982; Lantz 2001; Lantz et al. 2004).

Devil's club is found throughout northwestern North America from coastal Alaska southward to central Oregon and eastward to the Yukon, northeastern British Columbia, northwestern Alberta, Montana, and Idaho (Hitchcock and Cronquist 1961; Viereck and Little 1972; Voss 1985; Lantz et al. 2004). There are also several disjunct populations near Lake Superior in Michigan and Ontario (Hitchcock and Cronquist 1961; Viereck and Little 1972; Voss 1985; Lantz et al. 2004). It is a shade tolerant understory shrub associated with very moist, nitrogen-rich sites in semi-open mature and old-growth forests, on water-receiving floodplains, in well aerated seepages, along stream edges, water-collecting sites and even occasionally on water-shedding sites if soils are calcareous[2] (Klinka et al. 1989; Beaudry et al. 1999; Lantz et al. 2004). Young foliage is often damaged by late frosts but plants regenerate quite well; they are fully hardy in winter (Leśnej et al. 2006). Devil's club stems are upright to decumbent and can reach heights up to 6 metres (Roorbach 1999; Lantz 2001; Lantz et al. 2004). The leaves are large (up to 35 cm across) and maple-shaped. The stems, petioles, and leaf veins of devil's club are covered with a dense armor of yellowish needle-like spines up to 2 cm long. The flowers are small and whitish, in terminal pyramidal clusters, and ripen to shiny, flattened, bright red berries. Devil's club forms large sprawling clones that expand laterally through the rooting of decumbent stems, which tend to develop when tall plants

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[1] Synonomy: *Echinopanax horridus* (Sm.) Decne. & Planch. ex Harms, *Fatsia horrida* (Sm.) Benth. & Hook. f. ex W.H. Brewer & S. Watson. Synonomies from E-Flora BC. Available at: http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Oplopanax%20horridus. Viewed on Nov. 7th 2011. A complete botanical description and distribution of this deciduous shrub can be found on E-Flora.

[2] Calcareous soils are alkaline soils with a high pH, generally formed from the weathering of sedimentary rock with a high calcium carbonate content.

topple and put the stem in contact with the soil. The growth behaviour of devil's club is such that it likely achieves a maximum height of 4-6 metres, after which stems collapse and become recumbent and may or may not retain the root stalks as the recumbent stems sprout adventitious roots to initiate what appear to be new individuals (Lantz 2001).

5.1.1. Traditional Use of *Oplopanax horridus* in the Northwest

Northwestern coastal nations have ancient oral histories with respect to the use and power of devil's club and how it first came to be known as a potent plant with a variety of uses (Ryan 1929). It has a wide variety of medicinal purposes (Table 5.1). The first written record of its use for medicinal purposes in the Northwest is from 1842. The records of Eduardo Blaschke, chief physician for the Russian American Company, described the use of devil's club ashes mixed with the resin of conifer trees as a treatment for sores (Blaschke 1842, pg. 74). In 1888, Emmons described the Tlingit use of devil's club for treating wounds, infections and sprains (Table 5.1) (Emmons 1991).

The medicine is generally made from the inner bark, although some people prefer to use the roots alone or a combination of bark and roots. The medicine prepared is used both in external and internal medicinal preparations. For external use, the inner bark and/or roots is made into poultices and applied directly to an ailing or injured area of the body. For internal use, a drink is made by simmering the bark and/or roots. Table 5.1 lists some medicinal uses for devil's club by First Peoples in northwestern BC and neighbouring Alaska.

Spiritually, devil's club was used in purification rituals before hunting and fishing to bring good luck and to mask the human odour, and (in ceremonial rituals) to ward off evil. First Nations also developed technological uses for parts of the plant. The woody stems were cut into segments and used to make fishing lures; whole stems were made into spears, and the berries, bark shavings and charcoal were used for dye and as pigment for facepaint (Turner et al. 1982, 1983; Gottesfeld 1992; Compton 1993; Moerman 2002). There are few references to its use for food but early spring buds were boiled and eaten by some people (Compton 1993).

Table 5.1. Examples of medicinal uses for *Oplopanax horridus* by peoples living in northwestern British Columbia and adjacent Alaska.

Nation	Chest	Cough, colds	Purg., Emetic	Gen.	Ulcer	Preg., birth	cancer	Derm., cuts	Absc.	Tonic	Arth., Rheu.	Diab.	STD
Nisga'a	√	√	√	√		√	√	√	√	√	√		
Carrier				√$_{6}$		√$_{10}$					√$_{6}$		
N. Carrier			√$_{10}$	√$_{10}$									
S. Carrier						√$_{10}$							
Gitxsan	√$_{10}$	√$_{4}$	√$_{4}$	√$_{10}$	√$_{10}$		√$_{4}$	√$_{4}$		√$_{4}$	√$_{10}$	√$_{4}$	√$_{10}$
Tlingit	√$_{2}$		√$_{2}$	√$_{2}$				√$_{2,6}$	√$_{2}$		√$_{6}$		√$_{2}$
Wit'suwit'in	√$_{4}$		√$_{4}$				√$_{4}$	√$_{4}$		√$_{4}$	√$_{4}$	√$_{4}$	
Haida			√$_{8}$	√$_{6,8}$	√$_{6}$		√$_{6}$	√$_{12}$	√$_{8}$		√$_{,6,,12}$		√$_{8}$
Tahltan				√$_{1}$									
Tsimshian	√$_{8}$	√$_{8}$	√$_{3}$	√$_{8}$			√$_{8}$				√$_{4}$		√$_{8}$
Gitga'at	√$_{13}$	√$_{13}$	√$_{13}$	√$_{13}$				√$_{9}$		√$_{13}$	√$_{13}$	√$_{13}$	
Tainina	√$_{7}$	√$_{7}$	√$_{7}$	√$_{7}$					√$_{7}$	√$_{7}$			
Aleut								√$_{11}$*			√$_{11}$*		

References: 1 = Emmons$_{1}$1911, 2 = Emmons 1991, 3 = Garfield and Wingert 1966; 4 = Gottesfeld 1994; 5 = Hebda et al. 1997; 6 = Justice 1966; 7 = Kari 1995; 8 = McGregor 1981; 9 = Port Simpson Curricular Committee 1973; 10 = Smith 1929, 1997; 11 = Smith et al. 1973; 12 = Turner 2004; 13 = Turner and Thompson 2006. *= external applications
Key to abbreviations: Purg. = purgative; Gen. = general; Preg. = pregnancy; Derm. = dermatological Absc = abscess; Arth.,Rheu. = arthritis and rheumatism; Diab. = diabetes; STD = sexually transmitted disease.

5.1.2. Nisga'a Use of *Oplopanax horridus* (Wa'ums)

Wa'ums, as devil's club is called in Nisga'a, is highly regarded by most Nisga'a and is used for a variety of medicinal, spiritual and cleansing purposes. In 23 interviews, all collaborators recalled the name for this plant, could easily identify it and knew of some medicinal and/or spiritual use for the stems or roots of the plant. Some prepare medicine for themselves or for others from the stems or roots (Figure 5.1) (Sigidimnak̲' K'igapks – Alice Azak 2007, 2008; Benson 2008; Sigidimnak̲' Hlgu Wilksithlgum Maaksgum Hlbin – Emma Nyce 2009). Many young people as well could identify **wa'ums**, knew its Nisga'a name and believed that it was a powerful plant (Calder 2008; Myrle Grandison pers. comm. 2008; Mansell Griffin pers. comm. 2008; Lena Azak pers. comm. 2009). People of all ages continue to hold the plant in high regard, although not all were necessarily aware of specific uses or methods of preparation. The medicinal and spiritual uses for **wa'ums** are detailed in Chapter 2.

Figure 5.1. K'igapks preparing the inner bark of **wa'ums** for medicinal use.

Some collaborators stated that tall, straight devil's club stems are preferred because they make the best medicine. There was a general consensus that in the fall, when leaves are turning brown and the flowers are gone, is the best time to begin harvesting **wa'ums** (Sigidimnak̲' Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008; Sigidimnak̲' Hlgu Wilksithlgum Maaksgum Hlbin – Emma Nyce 2008; Sigidimnak̲' K'igapks – Alice Azak 2008; Sigidimnak̲' Alisgum X̲sgaak – Diane Smith 2008). One person said that if you are going to harvest it at other times, you should be sure to use the roots (Benson 2008). Stalks can be harvested throughout the winter, so long as the stems are upright and not frozen or under snow (Sigidimnak̲' Ẃii Ts'iksna'ak̲s – Pauline Grandison 2008).

As recounted in Chapter 2, the Nisga'a prepare a decoction or infusion of the inner bark and/or roots of **wa'ums** alone or mixed with other medicinal plants to make medicine for a variety of ailments (Benson 2008; Sigidimnak̲' K'igapks – Alice Azak 2008; Sim'oogit Gadim G̲aldoo'o – Charles Alexander 2008). They also use a decoction of bark and/or roots of **wa'ums** to wash the body in preparation for hunting and fishing to cover the human scent (Sim'oogit Gadim G̲aldoo'o 2008; Sim'oogit Hleek̲ – Joseph Gosnell 2008), and for a variety of other spiritual purposes such as bringing good luck and protecting against evil (Sim'oogit Gadim G̲aldoo'o 2008; Sigidimnak̲' Hagwilook̲'am saxwhl giis – Irene Seguin 2008; Sigidimnak̲' K'igapks 2007, 2008). In addition, the outer bark and/or whole stems (with thorns attached) are put in the corners of dwellings, around windows and near doors to drive out bad sprits and bring good luck to the home. Bark is also burned on the tops of wood stoves so that the powerful odour will bring forth feelings of peace and harmony to the dwelling and its inhabitants (Sigidimnak̲' Hagwilook̲'am saxwhl giis 2008).

For millennia, **wa'ums** has been harvested at many locations throughout Nisga'a territory. Many individuals, families and **wilps** (houses) had treasured collection areas, typically in mature and old-growth forests, where year after year they went to harvest stems of devil's club. Over the last 50 years however, there has been active commercial logging in the Nass Valley, disrupting many of the old **wa'ums** collection sites. While some feel that there is "lots of **wa'ums** around if you know where to look ... especially in the valley bottoms" (Sim'oogit Hleek̲ – Joesph Gosnell 2008), others have expressed concern that there is no longer as much available, and that logging is permanently destroying optimum devil's club habitat and inhibiting the regrowth of healthy stems (Anonymous 2008-2009[*]; Benson 2008).

5.1.3. *Western Research Trials of* Oplopanax horridus *(Devil's Club)*

Prompted primarily by its importance to indigenous cultures for thousands of years, devil's club has become the focus of research in recent times (McCutcheon et al. 1993; Lantz 2001; Lantz et al. 2004).

According to Lantz et al. (2004), research on the phytochemical basis for the active ingredients of devil's club is confused somewhat by the fact that three distinct taxa are recognized and accepted by the World Checklist of Selected Plant Families (WCSP[3]) as belonging to genus *Oplopanax*[4]. However, other authorities treat these three species as subspecies of *O. horridus*. This variation in nomenclature, coupled with the use of the common name "devil's club" for all three species or subspecies, can lead to confusion when interpreting research results related to the medicinal potential of North American devil's club. Although comparisons of medicinal effectiveness of these three species don't seem to have been made, it would be important to understand which species or subspecies of devil's club is involved in any given study. Unless otherwise noted in this chapter, research results refer to the species found in North America, *Oplopanax horridus* (Sm.) Miq.

The active ingredients contained in the inner bark of devil's club have been found to inhibit the growth of certain bacteria and fungi that cause a variety of illnesses, e.g., tuberculosis and fungal pneumonia (McCutcheon et al. 1994, 1997; Kobaisy et al. 1997). More recent studies suggest that devil's club may have an effect in preventing the further growth of several types of human cancer cells, and has benefits as a tonic and for the treatment of arthritis and rheumatism (Tai et al. 2006; Xiao-Li et al. 2010; Tai et al. 2010). Dr. Tai is also conducting research with respect to the effectiveness of devil's club in the treatment of adult-onset diabetes but said that results to date are not conclusive (Joseph Tai pers. comm. 2011). However, research suggests

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[*] Personal communication during incidental discussion; some of the people who expressed this concern wish to remain anonymous.

[3] WCSP is an international collaborative programme that provides the latest peer-reviewed and published opinions on the accepted scientific names and synonyms of selected plant families. It allows one to search for all the scientific names of a particular plant, or the areas of the world in which it grows (distribution). Available at: http://apps.kew.org/ See also: http://www.theplantlist.org/browse/A/Araliaceae/Oplopanax/

[4] These include *Oplopanax elatus* (Nakai) Nakai (of Russia and Korea), *O. japonicus* (Nakai) (in Japan) and *O. horridus* (in North America).

that devil's club is a hypoglycemic (lowers blood sugar) and so could potentially be useful in the control of diabetes (Small and Catling 1999).

5.2. Rationale and Objectives for this Pilot Study

Previous research into the growth of devil's club in forests of different ages reveals that devil's club stems increase very gradually in size with age and implies that it takes >50 years for plants to attain sizes typically found in undisturbed forests (Lantz 2001; Lantz and Antos 2002). In discussion with research collaborators (Chapter 2), there were two recurring comments with respect to the continued availability of **wa'ums**. Some felt that logging was destroying the best **wa'ums** habitat, while others felt that the plant remains abundant on Nisga'a core lands and traditional territory, if you knew where to look. The other comment was that tall, straight upright stems of **wa'ums**, "about an inch or so" in diameter, were preferred for medicinal and spiritual purposes because they made the best medicine and were the most powerful and effective for medicinal or spiritual purposes.

Based on the high regard that many Nisga'a have for **wa'ums** and the fact that many want to use it, coupled with the potential impact of logging on this important species, a pilot study was designed and undertaken to examine the following questions:

- does devil's club persist after clearcut logging?
- if so, after such disturbance, how long does it take the plants to recover to the preferred size?
- if not, what conservation and restoration measures would be appropriate?

Specific hypotheses include:

- devil's club does persist or recover after logging (given enough time and suitable microsites); and
- devil's club increases linearly in size with time since disturbance.

5.3. Methods

Because most people talked about the preference for collecting tall, straight stems with large diameters, it was decided to measure the length and diameter of upright stems to determine if suitable stems can be found after clearcut logging, and (where found) to estimate how long it takes for the preferred size to regenerate in these disturbed areas.

5.3.1. *Selection of Sites*

The clearcuts chosen for sampling were limited to those easily accessible by road. An effort was made to sample a wide range of clearcut ages, with time since logging based on visual assessment of the regeneration status of each site. Exact periods since disturbance (logging) were determined later based on GPS co-ordinates taken at sample sites, cross-matched to associated data bases maintained by the Nisga'a Lisims Government, B.C. Ministry of Forests, Lands and Natural Resource Operations, and Northwest Timberland Ltd. in Terrace, BC (Table 5.2). The old-growth stands selected to serve as a control were chosen because two collaborators, who make medicine from devil's club, collect from these areas. They preferred these sites because large stems were easily accessible and the forest was undisturbed.

5.3.2. *Data Collection*

A total of 180 individual devil's club stems at 18 sites, representing 10 stand ages (16 clearcuts and two old-growth forest sites), were sampled over a two year period (Table 5.2). In both years, sites were chosen on the day of sampling by slowly driving along logging roads looking for sites that would be recognized as characteristic of devil's club ecosystems (Banner et al. 1993): i.e., lower slope positions or depressions with rich vegetation. When sites were selected, GPS coordinates, along with site and habitat features (detailed below) were recorded from the centre of a patch of devil's club. Starting from the point where GPS coordinates were collected, the ten nearest specimens of devil's club were measured for basal diameter of each upright stem, leaf diameter of the four to five largest leaves on each plant (at the widest point), and main upright stem length (from the ground to the base of the terminal bud; Figure 5.2). For each population the following site features were also noted:

- slope position;
- evidence of fire;
- presence of slash (logging debris);
- species and abundance of dominant vegetation; and
- shading from trees or overtopping shrubs.

Table 5.2. Locations sampled for devil's club.

Site	Location	Easting	Northing	Elevation	BEC Zone	Age (yrs)
Site 1	Branch 234600, N. Kwinhak	476141	6102821	326	CWHws1	17
Site 2	Branch 234600, N. Kwinhak	474994	6104103	24	CWHws1	5
Site 3	Ksedin Creek Main line,	479473	6105153	538	CWHws1	17
Site 4	Ksedin Creek Main Line	481238	6105138	617	CWHws2	18
Site 5	Ksedin Creek Main line	478266	6105550	387	CWHws1	5
Site 6	Beaupre Ck. km. 8.7,	498842	6107006	703	CWHws2	20
Site 7	Beaupre Ck	499745	6105656	686	ICHmc2	16
Site 8	Beaupre Ck	500027	6104607	711	CWHws2	14
Site 9	Beaupre Ck	498003	6113055	269	ICHmc2	37
Site 10	Old Growth Gingolx	439669	6095286	254	CWHwm	295
Site 11	Gitwinksihlkw	486676	6121954	356	ICHmc2	11
Site 12	Gitwinksihlkw	487570	6122185	273	ICHmc2	11
Site 13	Gitwinksihlkw	488204	6121710	235	ICHmc2	11
Site 14	Gitwinksihlkw	488164	6120997	212	ICHmc2	11
Site 15	Kitsault	508735	6147287	236	ICHmc2	3
Site 16	Kitsault	508426	6144599	304	ICHmc2	3
Site 17	Kitsault	508643	6144395	251	ICHmc2	3
Site 18	Gingolx Old Growth 2	508668	6144575	258	CHWwm	296

UTM Zone 09

Clearcut dates from records of the B.C. Ministry of Forests, Lands and Natural Resource Operations, Nisga'a Lisims Government and Trevor Jobb of Northwest Timberlands, Terrace.

Figure 5.2. Measuring devil's clubs stems.
Note curled and sparse foliage in the foreground.

5.3.3. *Data Analysis*

Measurements from individual devil's club stems sampled at the 18 sites were summarized or each sample site, with the means statistically analyzed by linear regression and one-way analysis of variance (ANOVA) to test for the influence of stand age on devil's club attributes. Regression analysis searches for a significant linear relationship[5] between a continuous dependent variable (in this case, some measure of devil's club size) and a continuous independent variable (in this case stand age or years since logging). An ANOVA examines the variation within and among discrete treatments or populations (in this case, stand ages or stand age groups) and evaluates how much of the overall variation in a response variable (here, plant size) can be attributed to the treatment or independent variable.

Statistical analysis evaluated the following indicators of devil's club stem size:

- stem diameter (cm);
- stem length (cm);
- useable bark area (cm^2), estimated as the surface area of a cylinder based on stem circumference and 80% of its length (diameter*π * 0.8 * stem length).[6]

Overall relationships among these three variables in individual stems were explored using Pearson's correlation coefficient (SAS procedure CORR; SAS Institute 2004). Results are presented primarily for stem diameter as the diameter of stems was considered a crucial criterion for harvesting good **wa'ums** (Sigidimnak' K'igapks – Alice Azak 2007; Sigidimnak' Alisgum Xsgaak – Diane Smith 2008).

Linear regression analysis was conducted separately for each of the three response variables described above. With stand age serving as a continuous independent (predictor) variable, one statistical analysis was conducted with all sites, including old-growth forest nominally denoted as being 295 and 296 years old as per forest cover mapping (Table 5.2). Because this analysis spanned three orders of magnitude in stand age, regressions were also conducted to test for relationships with the logarithm (base 10) of stand age. A third analysis was conducted without the old-growth site, thereby being more directly informative of devil's club recovery after

[5] A linear equation describes a relationship in which the value of one continuous variable depends on (and is directly proportional to) the value of another continuous variable.

[6] Estimates of useable bark area are based on using approximately 80% of the length of the harvested stem for preparing medicine. When observing traditional harvesters collecting stems and preparing medicine for traditional use, it was noted that generally entire stems are harvested but the narrow taper at the top of the stem is typically not used.

logging. If a significant regression was obtained, the resulting equation for a straight line was used to interpolate the number of years after logging required for devil's club to reach some preferred size thresholds (in this study, 2.5 cm in basal diameter). All regression analysis was conducted using SAS procedure REG (SAS Institute 2004).

Visual inspection of scattergrams plotting plant size against clearcut age revealed the possibility for some sharp thresholds or categorical differences in the size of devil's club in stands of different ages. Although sampling was not designed to test for thresholds in devil's club performance among stand age classes, analysis of variance (ANOVA) was used to better define the existence and location of any categorical differences. Separate ANOVA runs were conducted for stand means of each of the above attributes to evaluate variation among:

- those stand ages for which more than one cutblock was sampled (and treating both old-growth sites as approximately equal in age);
- four stand age classes, with individual sites grouped by decadal intervals, as ages <10 years, 10-19 years, 20-40 years, and old growth (>250 years old);
- three clearcut age classes, with individual sites grouped by decadal intervals as <10 years, 10-19 years, and 20-40 years; and
- two clearcut age classes, <10 years and >10 years since logging.

These broad age classes were required, rather than testing among individual stand ages using ANOVA, in order to have at least two replicate stands in each age class. In these analyses, SAS procedure GLM was used for the ANOVA because the same number of stands was not sampled for all stand ages. When ANOVA results revealed a significant effect ($p<0.05$), a Tukey post-hoc multiple comparison test (an option in SAS procedure GLM; SAS Institute 2004) was conducted to identify significant differences among stand ages and/or stand age classes.

The analyses revealed high variability in stem sizes among and within the sites sampled. Therefore, the sources of this variation were further evaluated for the stems growing in clearcuts. Factors tested in one-way ANOVAs included simplified site moisture regime (mesic versus hygric), shading (shaded or open), aspect (S versus other directions or flat conditions), evidence of fire (present or absent), and the presence or absence of 27 individual indicator plant species (Klinka et al. 1989). That is, separate one-way ANOVA runs were used to test the variation of devil's club stem diameter (for example) growing on mesic sites compared to hygric sites, in the shade or in the open, and so on.

5.4. Results

5.4.1. *Overview*

Generally, it was not difficult to find devil's club growing in stands of all ages. Living stems were especially prevalent on sites with no evidence of fire (96% of stems sampled)[7], with northerly aspects (74% of stems sampled), on moist or mesic sites (87% of stems sampled), and in nearly equal numbers on sites with and without shade from other vegetation (54% and 46 % of stems sampled, respectively). Dead devil's club stems were observed on a number of sites. Living stems on all sites were either not disturbed during logging or had resprouted from damaged stems since logging. Such survival is to be expected, provided logging practices (e.g., slash burning) don't affect the health of the forest floor to the extent that regrowth and clonal expansion of devil's club stems is inhibited (Lantz 2001).

Stem diameter, length and bark area were all significantly correlated, with diameter a good indicator of the estimated amount of bark available (Table 5.3). Table 5.4 presents the mean stem diameter, stem height and estimated bark area of devil's club for each of the sites (16 sites ranging in age from 3 to 37 years since logging and two old-growth stands with nominal ages of 295 or 296 years). The largest stems with the most material with which to make medicine came from a stand 11 years old (Gitwinksihlkw 12). The means and standard errors of diameter, length, and estimated bark area for these stems overlapped with those found in the old-growth stands near Gingolx. The smallest stems were from a stand that had been logged 3 years earlier (Kitsault 17).

Table 5.3. Correlation of individual stem attributes (n=180).

Stem Attribute	Diameter	Length	Bark area
Diameter	r=1	r=0.765, p<0.0001	r=0.933, p<0.0001
Length		r=1	r=0.899, p<0.0001
Bark area			r=1

[7] i.e. only 4% of the stems sampled showed evidence of fire.

Table 5.4. Mean and standard error results for devil's club stem diameter, height and usable bark area for individual stands ordered by age.

Location ID	Stand age	Stems measured	Mean diameter	Standard error	Mean height	Standard error	Mean bark area	Standard error
	(yrs)	(number)	(cm)	(cm)	(cm)	(cm)	(cm^2)	(cm^2)
Kitsault 15	3	10	1.68	0.07	41.7	6.5	180	31
Kitsault 16	3	10	1.30	0.08	24.1	3.1	82	16
Kitsault 17	3	10	1.18	0.12	21.7	4.3	77	25
Ksedin 5	5	11	1.25	0.23	31.8	9.5	236	71
Kwinhak 2	5	10	1.49	0.14	51.2	6.1	204	38
Gitwink 11	11	10	2.57	0.20	121.1	4.1	780	65
Gitwink 12	11	10	3.29	0.27	135.9	5.7	1136	121
Gitwink 13	11	10	2.57	0.17	131.7	4.3	854	68
Gitwink 14	11	10	2.33	0.19	119.6	10.0	728	112
Beaupre 8	14	10	1.46	0.15	81.9	9.6	330	68
Beaupre 7	16	10	1.69	0.20	78.1	10.0	372	92
Ksedin 3	17	10	2.38	0.41	84.1	12.6	612	201
Kwinhak 4	17	10	1.54	0.20	85.6	9.8	371	82
Ksedin 1	18	10	1.35	0.10	41.5	4.2	145	20
Beaupre 6	20	10	1.43	0.11	59.0	4.1	219	34
Beaupre 9	37	10	1.71	0.15	42.5	5.6	196	40
Gingolx	295	10	2.67	0.29	88.9	10.7	639	105
Gingolx 2	296	9	2.30	0.19	64.6	2.5	471	48

5.4.2. *Regression Results*

When considering the average growth of devil's club at each site sampled (n=18), linear regression of mean stem attributes showed no significant relationship to stand age (p=0.1631 for stem diameter, p=0.8423 for stem length, p=0.5196 for bark area) or to $\log_{10}$ of stand age (p=0.0830 for stem diameter, p=0.3262 for stem length, p=0.2489 for bark area).When all individual stem measurements were treated as independent observations (n=180), a significant (p=0.0019) though very weak relationship (R^2=0.06) was detected for stem diameter as a function of stand age. More significant relationships emerged when stem size was regressed against the log of stand age: p=0.0001 (R^2=0.08) for stem diameter (Figure 5.3), p=0.0001 (R^2=0.08) for stem length, and p=0.0010 (R^2=0.06) for bark area.

Although the trends exhibited by these three variables suggest that stem size increases with stand age to a certain extent, the regression relationships explain only 6% to 8% of the variance observed. Further analysis of the data was therefore carried out in order to portray thresholds observed upon visual inspection of the data shown in Figure 5.3. For example, it appears that stands less than 10 years old rarely support devil's club with stem diameters greater than 1.8 cm, stem lengths greater than 60 cm, or estimated bark area per stem greater than 300 cm^2.

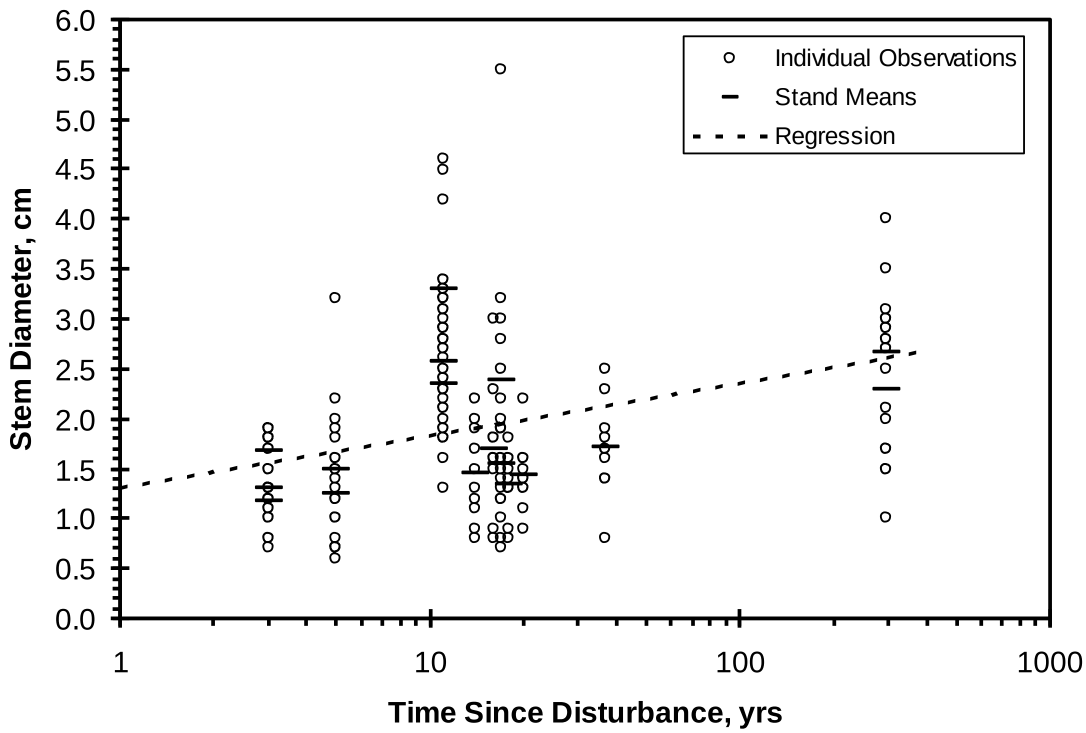

Figure 5.3. Relationship of individual devil's club stem diameters to time since disturbance, showing means for each site sampled, and the regression line derived for individual stem diameters: diameter = 1.29862 + 0.53186 $\log_{10}$(stand age).

5.4.3. *Analysis of Variance (ANOVA) Results for Stem Diameter*

Assessment of stem diameter differences using ANOVA and Tukey multiple comparison tests revealed some significant relationships among the five stand ages for which replicate cutblocks were available (F= 7.89, p=0.0070). But those differences (results not shown) were not consistently related to increasing stand age: devil's club in the 11-year old clearcuts had, on average, the largest mean stem diameter which were not significantly different from those of devil's club in the old growth, but were significantly different from the 3- and 5-year old sites.

When data from all the cutblocks sampled were combined into four decadal age classes, significant differences among stand age classes also emerged (F=3.45, p=0.0459). Due to the high variability within the four age classes (Figure 5.4), or perhaps the unequal number of stands within age classes, Tukey tests were unable to identify which means were significantly greater or less than others.

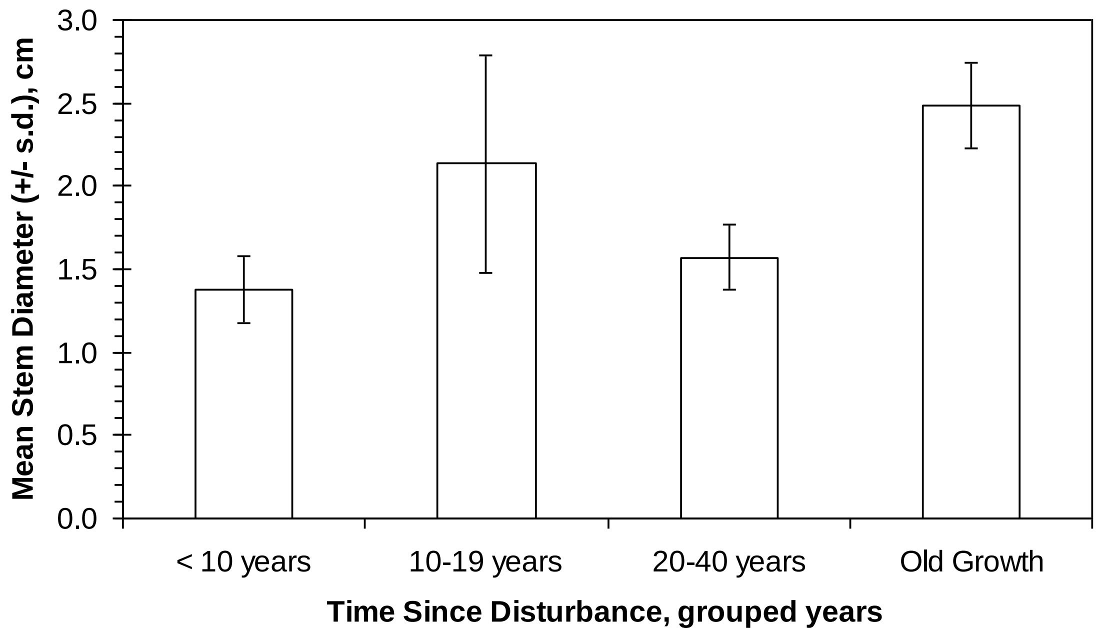

Figure 5.4. Mean devil's stem diameters in multiple stands grouped into four age classes; error bars are standard deviations among stand means.

Evaluating only the younger (<40 year old) stands – i.e., those that had been logged – in three age classes generated similar results for stem diameter: ANOVA F=3.53, p=0.0597. However, stem length differences were significant (F=10.72, p=0.0018), with stems in the 10-19 year age class averaging 98 cm in length, compared to 51 cm in the 20-40 year age class and 34 cm for those less than 10 years old. These differences were accentuated when testing for stand age effects around the 10-year threshold after disturbance, i.e., testing for significant differences between plants growing on clearcut sites <10 years old and >10 years old. ANOVA results for stem diameter demonstrated significantly larger stems in the older stands (where they averaged 2.1 cm) compared to the younger stands (averaging 1.4 cm; F=6.56, p=0.0209 Figure 5.5.). Even more pronounced results were found for stem length (averaging 87 cm compared to 34 cm; F=12.08, p=0.0025) and for bark area (averaging 528 cm^2 compared to 139 cm^2; F=8.25, p=0.0110).

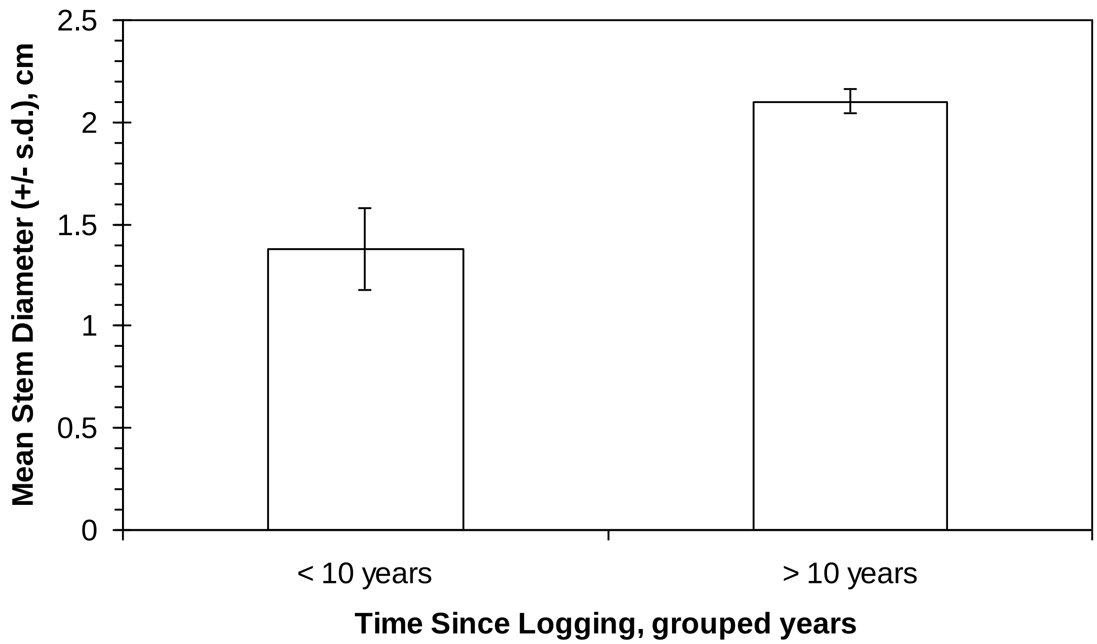

Figure 5.5. Mean devil's stem diameters in stands grouped into two age classes, namely clearcuts less than or greater than 10 years old since logging; error bars are standard deviations among stand means. ANOVA indicates that the means are significantly different at the 95% confidence level.

5.4.4. *ANOVA Results for Site and Species Association Factors*

Given the widespread variability in plant size revealed in the above analyses (especially in the cutblocks 10 to 40 years old), it appears that stand age alone is not the defining factor for determining the size of devil's club stems. One-way ANOVA to examine the relationship between stem diameter and stand age classes did not reveal a more consistent relationship than did regression analysis, although there seems to be some sort of threshold between 5 and 11 years of age. To further understand the variability observed in stem sizes, individual one-way ANOVAs were run to evaluate individual site factors that might contribute to differences in devil's club growth. Microsite factors such as evidence of fire, soil moisture regime, shading, aspect and the presence of various plant species were evaluated for their effect on stem diameter. For this analysis, only stems from the logged sites were evaluated (n=161) because the goal of this part of the study was to evaluate factors contributing to devil's club recovery after clearcut logging.

5.4.4.1. *Site Factors*

Analysis of the data with respect to the recovery of devil's club after logging showed that stems on slash-burned sites were significantly smaller than stems on unburned sites (F=11.15, p=0.0011). There were also significant effects when comparing open/shaded sites (F=6.36, p=0.0127) and gross site moisture regime (F=12.86, p=0.0004). Figure 5.6 shows the mean stem size was significantly greater when stems were growing in the open and on slightly drier sites.

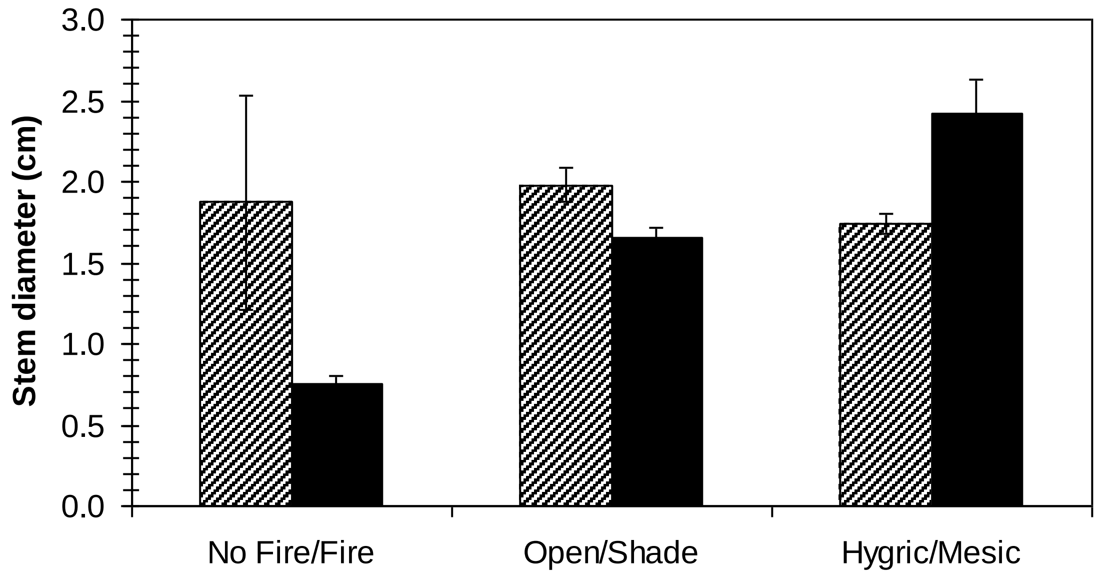

Figure 5.6. Significant differences (p<0.05) for devil's club stem diameters under contrasting (gray vs. black bars) microsite conditions. Error bars are standard errors of individual stem measurements.

5.4.4.2. *Species Association*

The presence or absence of particular plant species can be useful in predicting where larger devil's club stems are found. Table 5.5 lists 27 different indicator species and how frequently they were found growing in association with devil's club in clearcuts of all ages. Highlighted data show that there were eleven species for which their presence or absence was associated with significant (ANOVA, p<0.05) differences in the size of devil's club stems (Table 5.5).

The presence of a particular species growing in association with devil's club stems did not always signal superior diameters for the devil's club stems. Figure 5.7 shows that of the 10 species with significant relationships to devil's club stem size, only five were associated with an increase in devil's club stem diameters. These include two conifers, *Abies amabilis* (Pacific silver fir) and *Thuja plicata* (western hemlock), one shrub, *Rubus spectabilis*, (salmonberry),

Table 5.5. Mean and standard error for devil's club stem diameters associated with the presence or absence of plant species (or genera) observed growing in association with devil's club in all clearcut age classes.

Species	**Common name**	**Present**			**Absent**			**ANOVA results**	
		n	Mean	S.E.	n	Mean	S.E.	F	p
Abies amabilis	Pacific silver fir	10	2.55	0.16	168	1.86	0.07	6.46	0.0119
Athyrium filix-femina	lady fern	64	1.85	0.09	114	1.92	0.09	0.33	0.5644
Cornus canadensis	bunchberry	62	1.85	0.10	116	1.92	0.08	0.26	0.6114
Corylus cornuta	beaked hazelnut	10	1.54	0.20	168	1.92	0.07	1.87	0.1734
Epilobium angustifolium	fireweed	94	1.71	0.08	84	2.10	0.11	10.08	0.0018
Equisetum sp.	horsetail	30	1.49	0.08	148	1.98	0.08	8.59	0.0038
Geum macrophyllum	large-leaved avens	19	2.62	0.22	159	1.81	0.07	16.59	<.0001
Gymnocarpium dryopteris	oak fern	21	1.47	0.15	157	1.95	0.07	6.26	0.0133
leafy mosses	leafy moss	10	1.69	0.20	168	1.91	0.07	0.62	0.4316
Linnaea borealis	twinflower	10	1.71	0.15	168	1.91	0.07	0.51	0.4777
Lysichiton americanus	skunk cabbage	50	1.71	0.11	128	1.97	0.08	3.38	0.0678
Menziesia ferruginea	false azalea	41	1.68	0.13	137	1.96	0.08	3.64	0.0581
Poa glauca	glaucus bluegrass	19	2.62	0.22	159	1.81	0.07	16.59	<.0001
Populus tremuloides	trembling aspen	4	2.58	0.41	174	1.88	0.07	2.63	0.1063
Ribes sp.	currants	20	1.70	0.12	158	1.92	0.07	1.20	0.2748
Rubus idaeus	red raspberry	10	1.71	0.15	150	1.84	0.07	0.22	0.6426
Rubus parviflorus	thimbleberry	61	1.98	0.12	117	1.85	0.08	0.95	0.3317
Rubus spectabilis	salmonberry	29	2.59	0.13	149	1.76	0.07	26.68	<.0001
Salix sp.	willows	21	1.59	0.14	157	1.94	0.07	3.21	0.0747
Sambucus racemosa	elderberry	16	1.41	0.10	162	1.94	0.07	5.85	0.0166
Streptopus lanceolatus	rosy twisted stalk	1	1.90	-	177	1.90	0.07	0.00	0.9963
Thuja plicata	western red cedar	27	2.51	0.22	151	1.79	0.07	18.54	<.0001
Tsuga heterophylla	western hemlock	82	1.93	0.09	96	1.86	0.09	0.28	0.5943
Tsuga mertensiana	mountain hemlock	1	1.60	-	177	1.90	0.07	0.36	0.5487
Vaccinium membranaceum	black huckleberry	71	1.92	0.11	107	1.88	0.08	0.11	0.7361
Vaccinium ovalifolium	oval-leaved blueberry	71	1.92	0.11	107	1.88	0.08	0.11	0.7361
Veratrum viride	false hellebore	20	1.39	0.07	158	1.96	0.07	8.32	0.0044

one herbaceous species, *Geum macrophyllum* (large-leaved avens) and one grass, *Poa glauca* (glaucous bluegrass). In contrast, smaller than average devil's club diameters were associated with the presence of the shrub *Sambucus racemosa* (elderberry) and the herbaceous plants *Epilobium angustifolium* (fireweed), *Equisetum* spp. (horsetail), *Gymnocarpium dryopteris* (oak fern) and *Veratrum viride* (false hellebore).

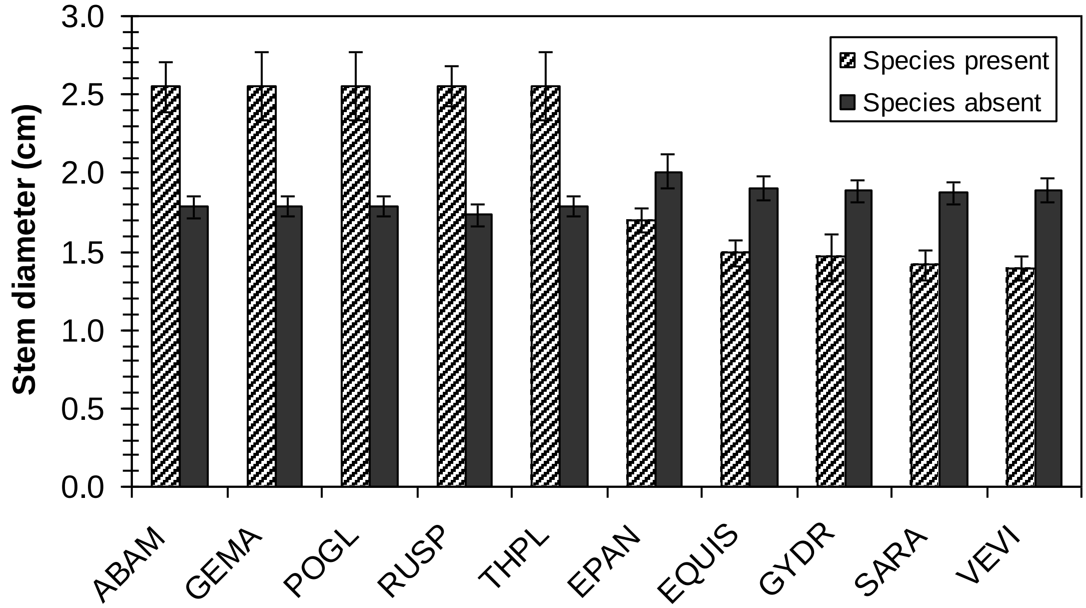

Figure 5.7. Significant results for analysis of variance comparing mean stem diameter in the presence/absence of individual plant species. Error bars are standard errors of individual stem measurements. Plant species codes are as follows: ABAM=*Abies amabilis*, GEMA=*Geum macrophyllum*, POGL=*Poa glauca*, RUSP=*Rubus spectabilis*, THPL=*Thuja plicata*, EPAN=*Epilobium angustifolium*, EQUIS=*Equisetum* spp., GYDR=*Gymnocarpium dryopteris*, SARA=*Sambucus racemosa*, VEVI=*Veratrum viride*.

5.5 Discussion

Nisga'a collaborators who use devil's club stems, for medicinal or other purposes, prefer to harvest them from undisturbed, old-growth forests. It is reasonable to expect that old-growth forests would have the largest stems of this slow-growing, shade-tolerant species, and that older clearcuts would support larger stems than more recent clearcuts. However, results suggest that, although time since logging is a factor in understanding the average size of devil's club after disturbance, other factors are also important. In particular, it is difficult to find large stems in the first 10 years after clearcut logging. The extent of stem damage from logging or fire, microsite factors (e.g., site moisture and nutrient availability, the presence of protective slash) also affect the persistence and recovery of healthy stems (Figure 5.6). These results are consistent with the literature which describes devil’s club as a shade tolerant species that is sensitive to fire and grows well on moist sites (Alaback 1980; Klinka et al. 1989; Howard 1993, Burton 1998; Roorbach 1999).

The significant relationships determined between devil’s club plant size (as indicated by stem diameter, stem length and bark area) and the logarithm of stand age supports the notion that stem size increases with stand age, though in a curvilinear manner. Field observations and subsequent analysis reveal that stand age alone does not predict plant size, as many of the largest stems were found in 11 year old stands (Table 5.4). In fact, relatively little of the variance (6% to 8%) in plant size was explained by stand age. There is a tendency for stems to increase in size with time since disturbance, but this relationship is not a linear one, as the rate of evident size increase in the first decade after logging does not continue indefinitely. Clearly other factors contribute to the persistence and recovery of devil’s club after disturbance because the largest stems are not always found in the oldest clearcuts. Under the right conditions, devil’s club stems in northwestern BC have been found that measure 6 cm in diameter (data in Burton 1998). Collaborators also report the incidental occurrence of plants of similar or greater sizes (Sim’oogit Ni’is Nag̲anuus – Steven Doolan 2007; Sigidimnak̲’ Alisgum X̲sgaak – Diane Smith 2008).

Stem diameters were found to be significantly smaller on sites where slash burning had occurred than on sites where there was no burning. Devil’s club is sensitive to fire (Fischer and Bradley 1987; Hamilton 2006) and is reported to be absent from burned sites for decades after catastrophic fire (Howard 1993). Its cover declines after slash burns of low to moderate severity (Hamilton 2006). This response to fire could reflect the fact that devil’s club, common on moist sites where fires are infrequent, is adapted to a long fire return interval (Banner et al 1993; Wong et al. 2003; Keeley et al. 2011). Shortening that interval through slash burning could affect the ability of devil’s club populations to persist on the landscape. Given the long natural fire return interval of ecosystems that support the growth of devil’s club, its sensitivity to damage by fire, and the criteria for its establishment and persistence, broadcast burning is not a recommended treatment after logging where maintenance of devil’s club is desired. Likewise, burn piles (consisting of logging slash, tree tops, and damaged wood) should not be placed on or near existing stands of devil’s club.

Devil's club is a shade tolerant species (Klinka et al. 1989; Burton 1998; Beaudry et al. 1999), and it can survive and persist in a forest understory. It can tolerate a wide range of light conditions from open to very low (Lantz 2001) but dominance by devil's club in a plant community may be favoured in shade (Roorbach 1999). Devil's club populations sampled by Burton (1998) showed higher plant biomass at light levels up to about 50% of full sunlight; biomass was no greater at higher light levels and was often less. Results presented here further substantiate these findings: devil's club was found in a wide range of open and shaded conditions, with some plants growing in open areas showing signs of stress (smaller leaves, leaves sometimes curled and edges browned). Nevertheless, significantly larger stems were documented under open conditions versus shaded conditions (Figure 5.6), where sunlight is blocked by shade from other living vegetation including juvenile conifer trees, shrubs, and herbaceous plants. Some of the largest stems ($F=16.75$, $p<0.0001$) were found growing in and among "dead shade," (i.e., shade cast by logging slash or wood waste) which does not compete with devil's club and may even limit competition from other vegetation. Given that devil's club can persist under a variety of light conditions, it is possible that the stems growing in close proximity to vigorous growth of other plants were in competition for moisture and nutrients and so were smaller. In contrast, devil's club stems growing in the shade of slash or logs were bigger because they can become dominant in shade and so were not competing for resources to the same extent (Roorbach 1999).

Formal determination of relative soil moisture regime (as described by Banner et al. 1993) at each sampling site was not conducted as part of this study. Nonetheless, observations of the habitat associated with individual stems often included observations on moistness of the soil and slope position. Analysis of those relationships revealed that stems were larger on sites that were slightly drier than those stems on very wet sites. Assuming that the very wet sites were sites that were not well drained, these observations are consistent with the perceived preference of devil's club for well drained, water-receiving sites (Klinka et al. 1989; Beaudry et al. 1999).

Devil's club stems were significantly larger when found growing in association with some species, and significantly smaller when growing in association with other species. Both *Rubus spectablis* (salmonberry) and *Veratrum viride* (false hellebore) are noted to be common associates of devil's club (Klinka et al. 1989), and can indicate sites suitable for devil's club even if it is not currently visible there. With the exception of *Poa glauca*, all of the species observed to be growing with devil's club (Table 5.5) are commonly associated with nitrogen-rich soils and fresh to wet soils (Klinka et al. 1989). It is possible that the smaller devil's club stems found in association with *Sambucus racemosa* (elderberry) and *Veratrum viride* (false hellebore), *Epilobium angustifolium* (fireweed) and *Gymnocarpium dryopteris* (oakfern) (Figure 5.7) reflect more intense competition from those species.

5.6. Conclusion

The need for this study was prompted by the fact that the Nisga'a consider devil's club to be one of their most important medicinal plants. Concern was expressed by some that devil's club is no longer so abundant in the Nass Valley, and that the large stems believed to make the best medicine are not as easy to find now due to clearcut logging. Based on the high regard the Nisga'a have for this medicinal and spiritual plant and the perception that it is being lost from the landscape, this pilot study was undertaken to address their concerns.

The results of this study reveal several important points related to the persistence and/or recovery of devil's club after logging:

- Devil's club can persist after logging, and there is a general tendency for stem numbers and size to increase as time passes;
- Unless they escape damage during logging, large devil's club stems can rarely be found in cutblocks less than 10 years old;
- Increase in size is only partially explained by time since logging, with stands as young as 11 years old producing stems equivalent in size to those in old-growth forests;
- Stems growing on sites that weren't burned after logging are significantly larger than stems growing on burned sites;
- "Dead shade" from slash and logs seems to be beneficial to the survival and growth of devil's club, as are somewhat well drained (but still moist) soils;
- Devil's club can recover after logging, provided that logging is carried out in a way that does not severely disturb existing devil's club populations.

Although devil's club can indeed persist and recover after clearcut logging, this does not mean that other components of old-growth ecology can recover as well. Some forest harvesting is a necessary part of our regional economy, but these results should not be considered an endorsement of old-growth logging or clearcutting. If we adopt a model of sustainable forest management that works toward the long-term conservation of all forest values (Adamowicz and Burton 2003), including the continued health of valuable medicinal plants such as devil's club, then the protection and facilitated recovery of non-timber forest products need to be considered before deciding where, when, and how to harvest trees.

In order to conserve devil’s club populations it is recommended that:

- healthy populations of devil’s club should be protected during clearcut logging, either in green tree retention patches or machine-free zones (Beese and Bryant 1999; Rosenvald and Lõhmus 2008);
- when clearcut logging, scattered slash should be left in devil’s club patches to provide protective shade for recovering plants;
- burn piles and slash burning should not be located in devil’s club patches;
- large-scale harvesting of devil’s club stems (if any) should be dispersed and monitored to determine sustainable rates of harvesting and recovery;
- a comprehensive ecosystem-based research trial should be undertaken to evaluate the demography, cover, biomass, and stem growth of devil’s club over a period of several years (related to soil type, soil moisture, soil nutrients, plant community, slope position, aspect and site history) after logging.

When considering the harvesting of devil’s club amidst the inspiration of ancient trees, old-growth forests offer both practical and spiritual values that cannot be replaced in a short period of time. In an old-growth forest, there are large devil’s club stems easily accessible on paths that have long been used for sustainable gathering. We cannot overlook the cultural and spiritual value of harvesting devil’s club and other traditionally used plants at locations that are familiar and have long been used for such purposes.

5.7. References

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Chapter 6

Nisga'a Plant Use: Past, Present and Future

> *When my grandfather was still alive too, and my mom and dad too, they would sit there by the table at lunch time. And they were all telling stories, lunchtime, suppertime, all meal times. They say that while you are eating, you're just like a sponge, you take in the story while you're eating. It will stay with you and you'll never forget it. It's like a tape recorder up there* (Sigidimnak̲' Alisgum X̲sgaak – Diane Smith 2008).

> *Today we learn most things from books and we write everything down. But in the old days, right when we were very young, we learned by watching and listening and helping however we could* (Sigidimnak' K'igapks – Alice Azak 2012).

6.1 Introduction

The title of this dissertation, "**Wilaat Hooxhl Nisga'ahl [Galdoo'o] [Ýans]: Gik'uuhl-gi, Guuń-sa ganhl Angoogam̓**" ("Using Plants the Nisga'a Way"), implies that the Nisga'a use of plants has always been, and will continue to be, an important part of Nisga'a lives. As reflected in the title, it was therefore the goal of this work to document traditional plant use, and in doing so, provide some insights as to how the cultural context of Nisga'a plant use has changed and how it will continue to do so.

Throughout this research, collaborators repeatedly recalled how their parents or grandparents would preserve fruit, carve canoes, tools and other implements, make medicine or use plants for spiritual purposes. They themselves did not have the same opportunity to immerse themselves so fully in those activities: they were children, teenagers and young adults during a period in history when the lives of indigenous people were rapidly changing. Most of the collaborators were sent away to residential schools at an age when, in their cultural tradition, they would have been consolidating information on traditional ways. In addition, rapid technological changes, advances in medicine, improved access to modern goods and services, and dependence on a monetary economy meant they were not so interested or able to learn the old ways. Nonetheless, the value of this knowledge is recognized, and the Nisga'a still retain aspects of their traditional culture with respect to plants while incorporating new ways to harvest, prepare and use them. For example, many Nisga'a jar or freeze fruit for their personal use and for traditional use at feasts. However, they not only collect berries from the wild, but grow cultivated varieties in their gardens or buy them from local growers or supermarkets. Similarly, some people harvest cedar bark for making baskets, or weaving headbands for regalia, but the cedar bark products (e.g., hats, bands, mats, baskets) are prepared for modern cultural events such as graduation ceremonies, or for sale as artistic creations. Some artists make their living from carving.

That the interest in plants and their many uses will continue into the future is evident from the renewed interest in Nisga'a cultural traditions on the part of younger people. At the university level, many people are taking classes in ethnobotany, Nisga'a language classes or general First Nations studies. In ethnobotany courses, students learn to identify plants and learn more about traditional plant use and knowledge in the Nass Valley and elsewhere. The classes are usually a combination of learning in a setting that blends traditional oral learning with book-based or web-based learning. Elders share their knowledge with students who also learn through lectures and university textbooks. This type of learning prepares them for a future where they become secure in their cultural identity, while providing an opportunity to acquire a post-secondary education that encourages them to expand upon what they learn.

Similarly, elders in the community routinely go into elementary school classrooms and preschools to teach the language, which inevitably includes discussion about plant use and plant names. The presence of elders sharing such knowledge in a modern classroom or pre-school setting helps young people understand and appreciate traditional knowledge in a context that also includes the knowledge and skills needed in the world ahead.

Based on the information and analysis reported in the preceding chapters, the purpose of this chapter is to summarize the importance of plants to the Nisga'a in the past and today, and then to extrapolate these trends to speculate on potential Nisga'a plant use in the future.

6.2 Nisga'a Plant Use in the Past

6.2.1. *General observations*

Chapter 2 provides a comprehensive description of traditional plant use for food, medicinal, spiritual and technological purposes. Work on this project has shown that the Nisga'a have a long history of plant use that has been passed down for generations (Nisga'a Tribal Council 1995, Vols. I-IV). The fact that plants were a vital part of traditional life is reflected in the fact that all collaborators remembered something about how plants were used in the past, despite the fact that many of them no longer participate in any kind of traditional harvesting or preparation. Although all collaborators today rely primarily on buying fruits and vegetables at regional supermarkets located over 100 km from their homes, they remember the uses, preparation and names for many of the traditional food plants on their territory. Similarly, although they primarily use western medicine to treat their illnesses, they recall their parents or grandparents preparing plants like **wa'ums** (devil's club), **ts'iks** (false hellebore), or **ho'oks** (amabilis fir) for medicine, and the use of **wa'ums** and **ts'iks** for bringing luck into the home. Such recollections are perhaps to be expected in an oral culture in which people have a long historic connection to their land. Their recollections are remarkable though, considering the impact of western culture on their traditional way of life as they were growing up, and are a testimony not only to their long history of relationships with plants and their territory but to the strength of their culture.

Over the course of this project, ~149 plant species were discussed with 21 collaborators (Appendix C). Trees, shrubs and herbaceous plants were predominantly discussed at the botanical species level. Because information related to grasses and grass-like plants, lichens, bryophytes, fungi and seaweeds was not as readily recalled or shared, these five lifeforms were usually discussed in a general sense, with a few types discussed more specifically. Through the collective memories of the collaborators and a review of available written material, uses for 110 species have been documented, with several species serving multiple roles in traditional Nisga'a culture (Table 6.1, Chapter 2).

Table 6.1. Summary of Nisga'a plant uses by growth form and biological category

Growth Form	Food	Medicinal	Spiritual	Technological	Total*
Trees	8	13	2	17	18
Shrubs	30	14	4	22	48
Flowering herbs	19	15	6	7	45
Ferns	2	1	0	3	6
Fern allies	2	2	0	4	6
Grasses/grasslike species	0	0	0	3	3
Mosses/Liverworts	0	2	0	4	6
Lichens	1	0	0	7	10
Fungi	2	3	0	1	6
Seaweeds	4	2	0	2	5
Horticultural spp.	4	0	0	0	4
Total	72	52	12	70	110

*Number of species having one or more reported uses.

Table 6.1 shows that shrubs were the dominant growth form recalled for food use. This high number is likely because the use of shrubs for food includes many berry species and the use of these berries was readily recalled because many of them continue to be harvested today. Trees, shrubs and forbs were all used for medicine in almost equal proportions.

Of the 21 collaborators (11 female and 10 male), women recalled more plant uses in all categories than men (Table 6-2). This trend may simply reflect the fact that, around the world, women have typically been the gatherers while men were the hunters (Ember 1978; Turner 2003; Waguespack 2005) and so the female collaborators were more knowledgeable about plants. However it may be that they were more comfortable discussing plants with me, another woman. Also, throughout their adult life, many of the female collaborators were the dominant caregivers and homemakers and would have had more time to practice and teach traditional ways, while men were more engaged in the western monetary economy and away from home more frequently.

Table 6.2. Summary of plant use by category and gender of collaborator*.

Categories	Total	Female	% Female	Male	% Male
Food	467	284	60.8	183	39.2
Medicinal	249	138	55.4	111	44.6
Spiritual	37	22	59.5	15	40.5
Technological	240	138	57.5	102	42.5

*Number of collaborators recalling use multiplied by number of species used for that category.

The oral interviews also revealed that both male and female collaborators remember learning all aspects of plant use from both their male and female relatives, but female relatives are more often remembered as teachers (Table 6.3). Men learned about plant medicines equally from their male and female relatives, but women were still more frequently mentioned by women as the ones who taught them about medicinal plant use.

Table 6.3. Origin of source of knowledge by gender based on collaborator recollections.

		Source of knowledge	
Type of plant use	Gender of collaborator	Male	Female
Food	Male	2	10
	Female	7	28
Medicinal	Male	12	12
	Female	15	28
Spiritual	Male	7	4
	Female	10	15
Technological	Male	13	9
	Female	8	16

*This information was compiled from the oral interviews by counting the number of times a collaborator recalled learning from a male or female relative.

The fact that women are more frequently mentioned as teachers with respect to plant use is consistent with historical information about people living off the land. Men generally travelled away from home to hunt, trap and fish while women cared for children, and gathered and prepared food for immediate consumption and storage (Turner 2003). If collaborators on this project had been asked who taught them about hunting or fishing, it is likely that men would be remembered as the dominant teachers.

6.2.2. *Documenting Nisg̲a'a Plant Names*

In addition to recording the use of plants, individual names were recorded definitively for 80 species: 13 tree species (conifer and deciduous), 35 shrubs, 17 flowering herbs (forbs), two ferns, one horsetail, two club mosses, three mosses, one liverwort, two fungi and four seaweeds. Many more plants were discussed, but Nisga'a names were either tentative, not recalled, or referred to by a common general Nisga'a term (e.g., **majagalee** for *Taraxacum officinale* (dandelion), *Achillea millefolium* (yarrow) and other wildflowers) (Chapter 2).

Plant names are an important aspect in the recollection of traditional plant use. On many occasions when collaborators did not readily identify a plant or recall any uses for it, learning the name of that plant would often trigger memories of past use. These kinds of recollection based on plant names serve to illustrate the important links between language and culture as embodied in the words of Tutchone elder Margaret Johnson, "the language helps you remember" (Johnson 2011).

6.2.2.1. *Similarities Between Nisg̲a'a and Gitxsan Names*

Information presented in Chapters 2 and 3 shows that many species were common throughout the Northwest and that regular exchange of both knowledge and goods was long an important economic and cultural activity for northwestern nations. This research also showed that many plant names were identical or similar between Nisga'a and Gitxsan (Smith 1929, People of 'Ksan 1980, Smith et al. 1997). Given the frequent contact between these two Nations, where species are common to both territories, similar names may be useful guidelines to future Nisga'a researchers in exploring plant use that is not recorded here. However, such similarities must only be considered a starting point for further collaborative research into Nisga'a traditional plant use, and should not be considered evidence that the Nisga'a used such species in the same or similar ways.

6.3. Nisga'a Plant Use in the Present

> *My great grandfather had strawberries – you can still see the strawberries that were there and there are some odd raspberries. He had a nice fence* (Sigidimnak̲' K'igapks – Alice Azak 2008).

Since the turn of the 19th century, the Nisga'a began working more frequently off their traditional territories for hourly wages (Lutz 2008). Men generally worked in the fishing and logging industries and women worked in the salmon canneries. The employment was seasonal, wages were low and market food was not always available, so many depended on tending gardens as well as harvesting wild plants to sustain themselves (Sigidimnak' K'igapks – Alice Azak 2008; Sigidimnak' Ẃii Ts'iksna'aks – Pauline Grandison 2008; Sim'oogit Gadim Galdo'o – Charles Alexander 2008). Unlike a generation or two ago, most households in the Nass Valley today do not have kitchen gardens, or at least not large ones. Although the eulachon harvest, salmon fishing and hunting remain a big part of the Nisga'a way of life, people are also dependent on the retail economy for many of their food needs, although some Nisga'a citizens have small private gardens. In recent years, some community members have experimented with establishing community gardens in Gitlaxt'aamiks, Laxgaltsap and Gitwinksihlkw.

People continue to harvest wild plants on a casual basis but the principle of the **ango'oskw** (control of a traditional territory by a particular family) does not necessarily guide harvesting practices. For example, when any Nisga'a want to collect berries they generally forage for them wherever they might be most abundant or can be conveniently accessed, rather than in the **ant'aahlkw** (proprietary berry picking place) of their **wilp**. Similarly, other food plants and plants for medicines are harvested from places where they are known to be most abundant. On the other hand, when harvesting of something specific like **hat'aÌ** (strips of inner bark) from **simgan** (western redcedar), people may go to their own traditional **ango'oskw** for this activity or request permission from members of another **wilp** before going out to harvest on the their **ango'oskw**.

6.3.1. ***Current use of Plants for Food***

In the modern day, the collection of wild plant foods, especially berries, is the most widely practiced traditional activity. Those who do harvest berries are aware of the best season for harvesting and the best places to go. People eat berries fresh, preserve them in glass jars, freeze them whole, or cook them with refined sugar to make them into jams. Freshly picked **maaý** (wild berries) are served at feasts as well as for personal use. Many still follow the tradition of giving the first berries (or any food) harvested to the head of the father's house, a practice called **wilksi-laks**.

Harvesting wild berries today symbolizes a blend of traditional and modern ways. Although berry picking today may not be governed by the concept of harvesting from your own **ango'oskw** (headed by a **Sim'oogit**), the Nisga'a are guided by the philosophy of the **Saytk'ilhl Wo'osim** (common bowl). The original concept of the **ango'oskw** has developed into an **ango'oskw** of the Nisga'a Nation, where there is a fair share for all Nisga'a (Griffin and Spanjir 2008).

6.3.1.1. *Season Rounds for Plant Foraging*

Most collaborators readily recalled the times and places in which the plants they were describing could be harvested. The first food routinely picked in any given year is the succulent leaves of **t'ipyees** (*Sedum divergens*), harvested in late March or early April (Table 6.1). Although technically not a berry, these little red unfurling leaves are eagerly harvested and eaten as they were in the past, mixed with eulachon grease as a dessert, or eaten on their own for their taste and to sweeten the breath. Some people harvest many **t'ipyees** and keep them in the refrigerator, but freezing them for use throughout the winter has not proven successful because the leaves became mushy. Similarly, one collaborator who eats the young stalks of **haḿoo<u>k</u>** (*Heracleum maximum*) found that these too became mushy when she tried to preserve them by freezing. Occasionally people teach their children about picking and eating **ulx** (newly emerging sprouts of *Rubus parviflorus* or *R. spectabilis*) but this activity is usually an incidental leisure activity.

In later April and early May, many Nisga'a harvest the leaves of **tiim la<u>x</u>la<u>x</u>'u** (*Rhododendron groenlandicum*[1] – Labrador tea or swamp tea) to use for tea. When picking in the spring, generally the leaves from the previous year are harvested, although some harvest the new leaves as well. The leaves are air dried and stored in paper or plastic bags or tins. The leaves are often given as gifts when visiting. Many appreciate the

[1] formerly known as *Ledum groenlandicum*

tea as a refreshing drink during and after dinner and the beverage is frequently served at feasts and tribal picnics.

Hlak̲'askw (*Porphyra* spp. **–** seaweed), found on the west side of the islands near Gingolx and at Iceberg Bay at the mouth of the Nass River, is harvested in late spring by some Nisga'a. **P'ihl'ooskw** (seaweed cakes) made from **hlak̲'askw** is also traded or purchased from coastal people who have easier access to this delicacy. **P'ihl'ooskw** is still a very popular food, enjoyed at feasts and at home.

In the early summer **is** (*Shepherdia canadensis* – soapberry) berries are eagerly sought. These berries are primarily used fresh or preserved to make soapberry "ice-cream," but some eat the berries as a tonic or use them for other medicinal purposes. As they are not abundant on Nisga'a traditional territory, they are often traded or purchased from Gitxsan or other northern interior peoples. **Naasik'** (wild raspberries) are picked in early summer, but today people more often pick cultivated varieties from their gardens or buy them at a local "u-pick" farm or from the supermarket. Berries of other *Rubus* species (such as *R. parviflorus* – thimbleberry, or *R. leucodermis* – blackcap raspberry) are picked incidentally. On the coast near Gingolx, people frequently harvest **miik̲'ook̲st** (*R. spectabilis – salmonberry*),

Next to soapberries, **simmaaý** (*Vaccinium membranaceum* – black huckleberry) and other *Vaccinium* species seem to create the most excitement amongst berry pickers, particularly in mid-summer. As with raspberries, many people buy cultivated blueberries from the supermarket, although most say they prefer the taste of the wild berries. Other berries such as **sbiks** (*Viburnum edule* – highbush cranberry), **snax** (*Crataegus douglasii* – black hawthorn) and **loots'** (*Sambucus racemosa* – red elderberry) are also harvested in the wild but this practice does not seem to be widespread today. Some harvest **snax** or **loots'** from their yards or gardens.

Other plant products are harvested incidentally, when people are out on the land for other reasons. For example, elders will sometimes harvest the roots of **t'uuna'akw** (*Typha latifolia* – cattail) and eat them fresh, if they happen to encounter them when they are at one of the eulachon camps.

Many elders have diets that consist primarily of fish and meat prepared traditionally, with little reliance on refined foods. However, even among elders, not all traditional foods are relished in the modern day. It is considered important, though, to teach students about foods no longer consumed but once enjoyed and perhaps necessary for survival. For example, in one village, the possibility of a school field trip with elders to demonstrate traditional harvesting of the inner bark of **sginist** (*Pinus contorta* – lodgepole pine) to make **ksuuw̓** has recently been discussed, although few people advocate a return to the widespread consumption of **ksuuw̓**.

Today, many Nisga'a actively harvest a variety of mushroom species (primarily *Tricholoma magnivelare* – pine mushroom) in the late summer and fall. Although mushrooms were not part of their traditional diet, harvesting them is a practice that has become popular over the last twenty years. Unlike the harvesting of berries for personal use, mushrooms are primarily harvested for sale to mushroom buyers for cash income and incidentally eaten during the mushroom season.

6.3.2. *Current Use of Plants for Medicinal Purposes*

The Nisga'a Lisims Government manages the delivery of health care for the Nisga'a and there is a diagnostic clinic in Gitlax̱t'aamiks and a satellite clinic in each of the other villages. Most people today seek medical advice from western-trained physicians and use prescription drugs and over-the-counter medications to treat their ailments. However, there is a growing interest in integrating traditional and cultural health with western practices for more effective, culturally appropriate treatment of illnesses. To prevent chronic illnesses such as diabetes, there is renewed interest in relying more on traditional foods and less on processed pre-packaged foods having less nutritional value. The Nisga'a Lisims Government was recently advertising a position for a Nisga'a Medicines Co-ordinator to coordinate the development, with Nisga'a elders, of a Nisga'a Valley Health Authorities Traditional Nisga'a medicines program (Nisga'a Lisims Government 2012).

Some people prefer to use traditional medicine in addition to or instead of prescription drugs. The roots and stems of **wa'ums** (devil's club – *Oplopanax horridus*) are the botanical product most widely harvested and prepared for medicine (Figure 6.1). It is taken in the form of a drink to treat a variety of illnesses and is used by many as a general tonic (Chapter 2). The root of **ts'aḵ'a aam** (licorice fern – *Polypodium* *glycyrrhiza)* is used by some for relieving sore throats and chest congestion (Figure 6.2). Many people make tonics from different berries and take them in increasing quantities to boost their intake of vitamin C when they are sick with colds or flu. Teas made with *Mentha arvensis* (field mint) and other leaves are used to make teas to settle upset stomachs. The leaves of **tiim laxlax'u** (Labrador tea – *Rhododendron groenlandicum*) are harvested by many and brewed into a tea to help induce a restful sleep and as a relaxant (Figure 6.3). One collaborator makes a tea from the leaves of **tiim laxlax'u** mixed with ground **wa'ums** bark as a tonic and relaxant. There is also growing interest in combining different medicines for treating a variety of illnesses, but the details of such recipes and practices are usually considered proprietary.

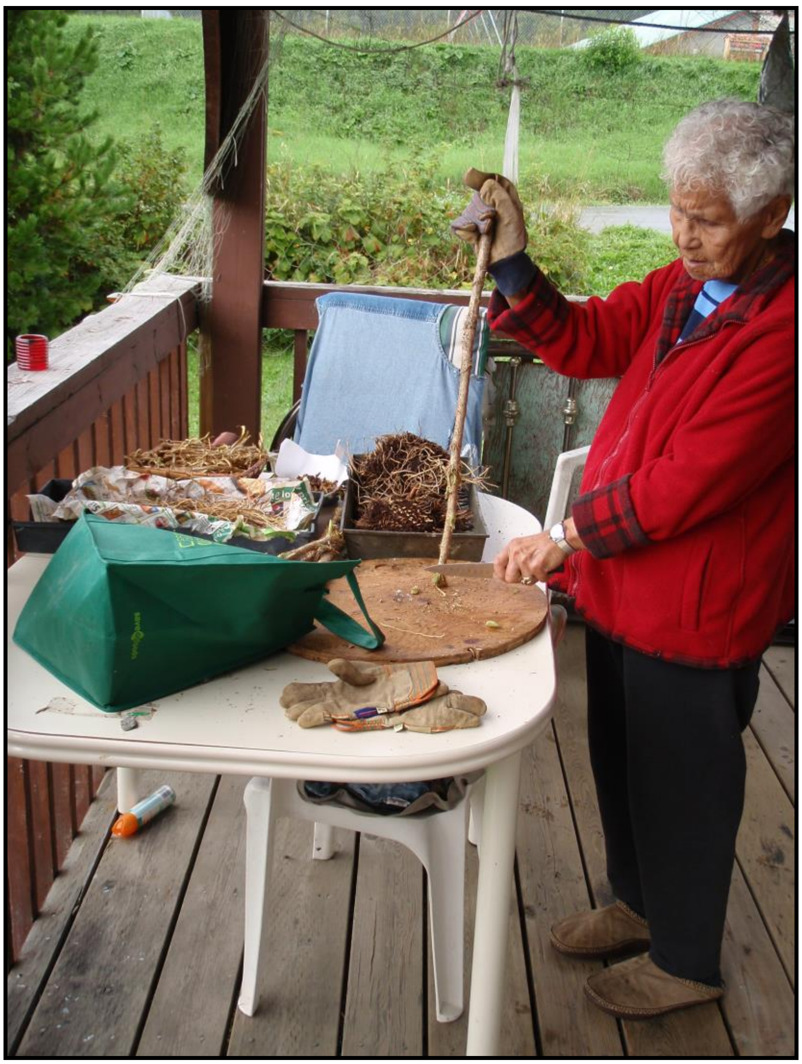

Figure 6.1. Sigidimnak' K'igpaks preparing **wa'ums** bark for medicine.

Figure 6.2. Roots of **ts’iks** (upper), and **ts’ak’a aam** (lower left) and **wa’ums** bark prepared for medicinal use.

Figure 6.3. Sigidimna<u>k</u>’ Hagwiloo<u>k</u>’am saxwhl giis and her grandchildren harvesting **tiim la<u>x</u>la<u>x</u>’u**.

6.3.3. *Current Use of Plants for Spiritual Purposes*

Two plants, **wa'ums** (devil's club – *Oplopanax horridus*) and **ts'iks** (false hellebore – *Veratrum viride*), are actively used for spiritual purposes. Many people put **wa'ums** stems or stem pieces in the four corners of their house, or even the corners of each room in their homes, to bring good luck and to keep evil away. Also, smudges of the stems and roots are burned on stove tops and the smoke produced is counted on to drive away bad thoughts or evil. Some make smudges to make their homes smell welcoming to good spirits and good people. Similarily, **ts'iks** roots are used to bring good luck. Some people burn the roots, use them in bathing, or carry them around in pouches or necklaces for good luck and keeping away evil.

6.3.4. *Current Use of Plants for Technological Purposes*

In the modern day, trees and shrubs continue to be used for technological purposes. **Anisa giikw** (boughs of western hemlock – *Tsuga heterophylla*) are used, as they were in the past, for lining the **ansaan** (bin) that holds **saak** (eulachons) while they are drying in the sun (Figure 6.4). **Daklhlim** (mauls) are made from the branches of **s<u>k</u>'an milkst** (crabapple trees – *Malus pacifica*) and conifer trees, to pound **dee<u>x</u>** (poles made from **giikw**) into the river bed (Figure 6.5). **Dee<u>x</u>** hold the **daga'ahl** (net) in place that is used for catching eulachons. The roots of **s<u>k</u>'an milkst** are heated on an open fire so they can be bent into a hoop, then the ends are tied together and used to make **w'agaa** (Figure 6.6).

Figure 6.4. Saak drying in an **anjam** protected by **anisa giikw** at Fishery Bay.

Figure 6.5. Alvin Azak using a **daklhlim** to pound **dee<u>x</u>** into the river bed at Fishery Bay.

Figure 6.6. Silas Azak at Fishery Bay holding a **w'agaa** made from the roots of **sk'an milkst** heated over an open fire and bent into a hoop shape.

Figure 6.7. Trevor Knott stirring **saak** using a **haageexanskw** made from **simgan** (Fishery Bay).

The hooped **w'agaa** slides from the top to the bottom of the **deex** and holds the **daga'ahl** apart. **Haageexanskw** (grinding paddles) made from **simgan** (western redcedar -- *Thuja plicata*) are still used to scrape the **anjamsnoo** (cooking bin) to prevent the **saak** from sticking to the bottom of the bin and to release the steam (Figure 6.7) (Sim'oogit Gadim Galdoo'o -- Charles Alexander 2008).

Luux (red alder – *Alnus rubra*) and **ksiluux** (green alder, i.e., undried red alder) is the preferred wood for smoking eulachons because it burns hot. **Ammḿaal** (black 321 cottonwood – *Populus balsamifera* ssp. *trichocarpa*) is preferred for smoking salmon because it doesn't burn so hot that it will make the fish too hard or dry. In addition, many homes continue to heat their homes with firewood, for which any species of tree (but mostly conifers) is suitable so long as the wood is well dried.

As in the past, **simgan** (western redcedar – *Thuja plicata*) is an important life-changing tree, widely used today in Nisga'a culture. Mature **simgan** are valued for totem poles and canoes and as beams for buildings designed to reflect traditional architecture. The village of Laxgaltsap has an area where canoes are carved using a combination of traditional and modern tools (Figures 6.8 and 6.9). A traditional Nisga'a canoe program launched in 2008 involves Nisga'a learning to carve canoes and paddles under the instruction of Nisga'a master carvers. Nisga'a youth then take part in canoe trips along the coast and on the Nass River system, with cultural teaching from elders along the way. Such carving of canoes based on patterns similar to those of ancient tradition and the trips in these canoes are used both to teach the past and instruct and inspire young people in the hopes of preparing them for a successful future that embodies the discipline and strength of traditional ways (Figure 6.10) (Murdock-Smith 2008).

Cedar bark from both **simgan** and **sgwinee'e** (yellow cedar -- *Chamaecyparis nootkatensis*) is harvested and used to make baskets, mats, headbands and other items to be used as part of regalia worn at feasts, graduation ceremonies, weddings and other celebrations. Greenery from some **bilak** (mosses) and *Lycopodium* spp. are harvested for making wreaths and other decorations for personal use or for sale (Sigidimnak' Alisgum Xsgaak -- Diane Smith 2008). Artists carve woods of **luux** (red alder -- *Alnus rubra*) and **k'ookst** (Douglas maple -- A*cer glabrum*) and many make a living from selling their artwork (Sim'oogit Gwiis Ha -- Roger Watts 2008).

6.4. Speculation on Plant Use in the Future.

> *We must take care of this earth -- all the animals, every stream in the valley -- and this land on which you and I live*. (Ayuukhl Nisga'a (as quoted in Nisga'a Lisim Government n.d.).
>
> *Ecological sustainability is a prime consideration in the development and approval for all operations within Nisga'a Lands and the Nisga'a Forest Act sets high standards to maintain biodiversity* (Nisga'a Lisims Government n.d.).

Since the signing of the Nisga'a Treaty in 2000, the Nisga'a have been empowered and free to make decisions with respect to management of 2000 km^2 of core Nisga'a land. As

Figure 6.8. Examining a cedar log before carving begins.

Figure 6.9. Master carver Alver Tait holding a hand-carved wood tool.

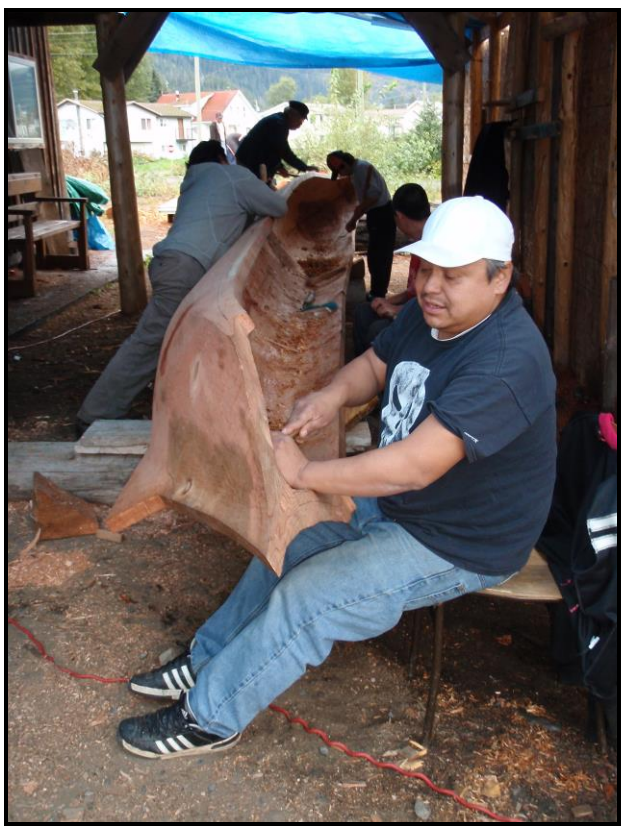

Figure 6.10. Albert Stephens carving a traditional **ḿaal** (canoe) from **simgan**.

in the past, management of their forest resources continues to be an important aspect of their culture. Today the primary focus of forest management includes managing timber harvesting (primarily of cedar, hemlock, spruce and fir species) as well as the development of economic opportunities around non-timber forest products (Nisg̱a’a Lisims Government n.d.). In order to ensure sustainability of any harvested plants – whether for timber or non-timber products -- inventories, monitoring and research with respect to regeneration and growth will be an important part of such development.

Today, the harvesting of pine mushrooms (*Tricholoma magnivelare*) is the dominant non-timber forest product industry. There are opportunities for the commercial utilization of other mushroom species and other non-timber forest products, such as harvesting wild berries for jams and juices (Burton 1999). Other possibilities include the harvesting of devil’s club (Chapter 4), other potential medicinal products, and the harvesting of floral greens. Developing opportunities for compatible forest management (the integration of timber harvest with management for non-timber forest products) can provide social, ecological and financial opportunities (Berch and Kranabetter 2010) that could benefit the Nisg̱a’a well into the future.

6.4.1. Future Food Use

Current cultural practices indicate that traditional foods will continue to be used on a day to day basis and remain an important aspect of the strong Nisg̱a’a feasting tradition. Eating preserved wild and cultivated berries and soapberry whip and drinking **tiim lax̱lax̱’u** at the end of feasts will likely continue well into the future (Chapter 2).

Management of the forest in the future may include managing for a sustainable supply of wild plant foods. Given current trends towards a global economy, it is likely that people will continue to access much of their food for personal use from distant places. However, the growing interest in accessing food locally, the “100-mile diet” and bioregionalism (Smith and MacKinnon 2007; Rose et al. 2008) suggest that the Nisg̱a’a may have renewed interest in harvesting wild berries and other plant foods from their land. In addition, new wild foods not traditionally consumed may become an important part of eating from local sources. For example, there may be an increase in the use of green shoots of **ḵ’ots** (false Solomon’s seal – *Maianthemum racemosum*) or the fiddleheads of ostrich fern (*Matteuccia struthiopteris*) which are sometimes found at farmer's markets.

Due to an increase in illnesses such as diabetes and heart disease, there is a growing interest in many First Nations communities in North America to return to a greater use of traditional foods (Turner and Turner 2007). Nisga'a Valley Health offers workshops for their citizens to help them control these and other conditions related to an increased consumption of processed foods and a reduction in physical activity. While eulachons, salmon and wild game are still a large part of the Nisga'a diet, the use of traditional plant foods is not so widespread. A return to the consumption of healthy fruits and greens harvested from their land could become an important way both to encourage physical activity and add high-quality nutrition to the diet (Kuhnlein and Turner 1996; Chan 2011).

6.4.1.1. Future Development of Non-timber Food Products

<u>Mushrooms</u>

Nisga'a core lands have a large area in the Interior Cedar-Hemlock (ICH) biogeoclimatic zone that is considered to be prime habitat for pine mushrooms. Pine mushrooms are mychorrizal[2] on lodgepole pine (*Pinus contorta*) and western hemlock (*Tsuga heterophylla*) trees, and depend on this association with mature trees for their propagation and survival (Kranabetter et al. 2002; Menzies 2006; Berch and Kranabetter 2010). Logging in a way compatible with the goal of maintaining prime habitat for these mushrooms will be an important part of future forest management, to ensure a continuous supply of pine mushrooms.

Depending on supply and demand, other mushroom species (e.g., boletes – *Boletus* spp., cauliflower mushrooms – *Sparassis crispa*, and chanterelles – *Cantharellus* spp.) could be harvested in the future. With careful management and planning, mushroom harvesting and processing could become a local small-scale industry for the Nisga'a.

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[2] A mychorrizal relationship is the symbiotic (mutually beneficial) association of the mycelium of a fungus with the roots of certain conifers and other plant species.

<u>Blueberries</u>

The development of a small industry based on the harvest of wild blueberries and huckleberries for the production of jams, juices or other food products could be developed on Nisga'a core lands where several *Vaccinium* (blueberry and huckleberry) species can be found. Such an initiative would require the recognition and special management of optimal habitat to be maintained as berry producing areas. Berry production could be managed in conjunction with clearcut harvesting and lower silvicultural stocking standards for forest regeneration. Optimal berry sites could be further maintained through brushing and/or the re-introduction of controlled burning to optimize berry production (Johnson 1994; Burton et al. 2000; Burton 2006; Trussler and Johnson 2008). Development of a small-scale industry based on sustainable berry harvesting could create much needed local employment in the future (Burton 1999).

<u>Other Food Products</u>

Harvesting **<u>k</u>'alams** (rosehips) and various leaves and/or roots from plants such as **tiim laxlax'u** (*Rhododendron groenlandicum*), **naasik'** (red raspberry), yarrow (*Achillea millefolium*), or mint (*Mentha arvensis*) may provide opportunities for the development of a small cottage industry. These products, all found in the Nass Valley, are currently sold in health food stores, but primarily seem to be derived from European or eastern sources. Harvesting in a sustainable manner will be an important aspect of any such industry, and research into the optimum time and practices for harvesting may be needed. The practice of spring harvesting old leaves only was recalled by one research collaborator (Sigidimna<u>k</u>' Hagwiloo<u>k</u>'am saxwhl giis – Irene Seguin pers. comm. 2010). Recent research suggests that harvesting only the mature leaves of *Rhododendron groenlandicum* results in better growth of plants in the next growing season. In contrast, harvesting both old and new leaves constrained growth and future lead production (Tendland et al. 2012).

6.4.2. *Future Use of Plant Products for Medicinal and Nutraceutical Purposes*

It is likely that the Nisga'a will continue to use **wa'ums** (devil's club – *Oplopanax horridus*) for medicinal purposes. In addition, since this species is under study by western researchers for its potential as both a pharmaceutical and nutraceutical product (Chapter 2), there may be increased interest in harvesting it commercially. However, if devil's club or any other medicinal plant traditionally used by the Nisga'a is harvested commercially, sustainable harvest and the issue of intellectual property rights will be important considerations for such development (Nabahan et al. 1996).

Compensating First Nations for their knowledge is a complicated issue. Intellectual property rights, as they exist today, do not take into account the cultural laws and protection unique to each First Nation. In the case of medicinal and nutraceutical ideas, sharing the information so a "product" can be developed means that the information must be made public. This practice means that the knowledge is open to appropriation by outsiders. Determining how compensation can be fairly apportioned is also difficult where medicinal preparations and use are similar amongst many First Nations[3] (Assembly of First Nations 2009).

Plants such as yarrow (*Achillea millefolium*), arnica (*Arnica* spp.) and fireweed (*Epilobium angustifolium*) are currently used worldwide to make nutraceutical products for treating minor ailments (Small and Catling 1999). These species are all found on Nisga'a core lands and it is plausible that these or other potentially useful species could be harvested and perhaps even processed in the area. Sustainable harvest of any plant species will be an important consideration for such use.

6.4.3. *Future Use of Technological Plant Products*

Because the eulachon harvest is such an identity-confirming activity for the Nisga'a, the traditions around the harvest, including the manufacture and use of traditional tools, can be expected to continue as a dominant part of Nisga'a culture.

Nisga'a lands provide many plant products that may be harvested for use in arts and crafts well into the future. With the revival of interest in traditional knowledge, the sustainable harvest of cedar bark will likely continue to be a part of Nisga'a culture as people make goods for personal use in regalia or to sell for cash income. This kind of economic activity will provide elders with the opportunity to continue to teach ways to

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[3] For more information on this topic see http://www.afn.ca/uploads/files/rp-research_ethics_final.pdf Accessed May 1st 2012.

harvest cedar bark without damaging the trees as well as techniques for basketry and other cedar-based arts.

As in the past, trade between northwestern First Nations in valued raw materials such as cedar wood for carving canoes will continue to play a role in Nisga'a culture. The exchange of **simgan** to make canoes has become especially important since the Traditional Nisga'a Canoe Project was launched in 2008. Logs from the Kitkatla First Nation were given as a gift to the Nisga'a to launch their Traditional Nisga'a Canoe project[4].

There is also the potential for development of a small-scale industry based on the sustainable harvest of floral greens or other craft materials from Nisga'a core lands. For example, falsebox (*Paxistima myrsinites*) found in the area is often used commercially in fresh floral arrangements and could be harvested for this purpose. Careful management of any non-timber resource will be a necessary part of any such industry to avoid overharvesting (Lynch and McLain 2003, Ehlers et al. 2003).

Like falsebox, new species not traditionally harvested may become an important part of the developing Nisga'a economy. Future utilization of such plants will help to ensure the continued foraging and preparation of wild plants and provide an ongoing connection to the land that reinforces the cultural identity of the Nisga'a as the People of the Nass River Valley.

6.5. Outcomes of this research

This research, which took almost six years to complete, is the combined effort of many people. As such, there are several positive outcomes that aid in assuring that Nisga'a traditional botanical knowledge has been made more available now and will become an inspiration for the future.

As a result of this research:

- Nisga'a plants use with respect to food, medicinal, spiritual and technological uses has been documented.

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[4] For more information on the Traditional Nisga'a Canoe Project please see https://sites.google.com/a/nvha.ca/main/the-canoe-journey

- There is a stated increase in interest to learn about plants and their traditional uses. It is hoped that an online resource based on this research will be made available for the Nisga'a to access and revise as more information becomes available.
- The possibility of a Nisga'a publication on their traditional plant use is under discussion by some Nisga'a.
- Nisga'a plant names have been connected to the correct scientific names for many species.
- Spellings of plant names have been updated and revised for use in Nisga'a language classes, in school classrooms, and for the online Nisga'a language resource, First Voices.[5]
- Herbarium sheets for use in classrooms and on display at the Nisga'a Museum in Laxgaltsap have been prepared. These herbarium sheets include traditional plant names and uses, as well as standard information such as scientific name and collection location.
- Voucher specimens of plant species discussed are available to the Nisga'a for their storage and use.
- Photographs of most of the plant species discussed are available to the Nisga'a for use in publications and to assist in future species identification.

6.6. Conclusion

The primary goal of this research was to document Nisga'a traditional ethnobotanical knowledge. The Nisga'a ethnobotany presented here is a good beginning but it is far from complete. Nonetheless, it represents an organized effort conducted in collaboration with Nisga'a elders and other citizens to record Nisga'a traditional plant knowledge based on correct species identification.

It is important that any further effort to document Nisga'a ethnobotany be undertaken very soon. During the course of this research, several elders who held important traditional knowledge passed away, and with their passing much of their knowledge was lost because it had not been fully documented or recorded. The elders of

[5] First Voices available on-line at: http://www.firstvoices.com/

today (some of whom were collaborators in this research) constitute the last generation of Nisga'a who actively participated in harvesting at least some of their traditional foods and medicines with their parents and grandparents. Many are eager to share their knowledge, especially with younger generations of interested Nisga'a.

The knowledge recorded here belongs to the Nisga'a. As a researcher given permission by the Nisga'a to do this collaborative work, I have made every effort to accurately transcribe the information in a respectful way that would be useful and hopefully an inspiration to the Nisga'a to expand on this study.

6.7. References

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Appendix A. Key to the Nisga'a Alphabet[1]**.**

Name of Sound	**Form**	**Example**		**Closest English Equivalent**[2]	
Short A	**a**	l**a**kw	firewood	**a**	apple
Long A	**aa**	ad**aa**wak	story	**aw**	l**aw**
B	**b**	**b**ilak	moss	**b**	**b**erry
D	**d**	**d**amtx	fern	**d**	**d**andelion
Short E	**e**	g**e**nx	trail, road	**e**	m**e**t
Long E	**ee**	majagal**ee**	flower	**ay**	cl**ay**
Front G	**g**	digit	smoked oolichans	**g**	**g**rass
Back G	**g**	gan	tree	**gg**	lo**gg**er
GW	**gw**	**gw**oom	dust or ashes	**gu**	lan**gu**age
H	**h**	hap'iskw	grass	**h**	**h**ay
HL	**hl**	**hl**ak'askw	seaweed	**l**	l in p**l**ay
Short I	**i**	**i**s	soapberries	**i**	it
Long I	**ii**	g**ii**kw	hemlock tree	**ee/ea**	str**ee**t, tr**ea**t
J	**j**	**j**axwas	salal berries	**j**	**j**asmine
Front K	**k**	**k**siluux	green alder	**k**	key
Hard Front K'	**k'**	tl'oo**k'**	mud	**k'**	loo**k***
Soft Back K	**k**	see**k**s	spruce	ck	back*
Hard Back K'	**k'**	**k'**ookst	maple tree	**clear throat**	crows call "**caw**"*
Soft KW	**kw**	**kw**sit	autumn/fall	**qu**	**q**ueen*
Hard KW'	**kw'**	kuu**kw'**	animal tail	**qua**	a**qua***
Soft L	**l**	ḿaa**l**	canoe	**l**	**l**awn
Hard Ĺ	**ĺ**	hat'a**ĺ**	inner cedar bark strips	**ll**	mi**ll**imeter
Soft M	**m**	**m**aaý	berries	**m**	**m**ountain
Hard Ḿ	**ḿ**	ha**ḿ**ook	cow parsnip	no	equivalent
Soft N	**n**	i**n**uu	turnip	**n**	tur**n**ip
Hard Ń	**ń**	sga**ń**ist	mountain	no	equivalent
Short O	**o**	l**o**k	rotten	**o**	**o**pposite
Long O	**oo**	l**oo**ts'	elderberries	**aw**	str**aw**berry
Soft P	**p**	wil**p**	house	**p**	**p**ine
Hard P'	**p'**	**p'**ihlooskw	squares of seaweed	**pp**	a**pp**le
S	**s**	**s**biks	highbush cranberry	**s**	**s**almon

[1] Orthography developed by Bruce Rigsby 1973 (in McKay et al. 1986; in Tarpent 1987)
[2] Closest English equivalent word suggested by Nisga'a language instructor Sigidimnak' Hagwilook'am saxwhl giis -- Irene Seguin pers. comm. 2012). The words with * are only approximations of the Nisga'a sound. An audio version of the complete Nisga'a alphabet is available: http://www.firstvoices.com/en/Nisgaa/welcome.

Appendix A. continued.

Name of Sound	Form	Example		Closest English Equivalent	
Soft T	**t**	ts’ak’a **t**yaý́tkw	hazelnut	t	**t**oma**t**o
Hard T'	**t'**	**t'**aagan	lumber	**tt**	ca**tt**ail
Hard TL'	**tl'**	**tl'**ok'ats	rhubarb	**tl**	po**tl**atch
Soft TS	**ts**	tl'ok'a**ts**	rhubarb	**ts**	**ts**unami
Hard TS'	**ts'**	gayda ts’uu**ts’**	mushroom	**ts**	lo**ts**
Short U	**u**	ulx	sprouts	**u**	**oo**ps but not long sound as in school
Long U	**uu**	l**uu**x	alder	**oo**	sch**oo**l
Soft W	**w**	**w**a'ums	devil's club	**w**	watch
Hard Ẃ	**ẃ**	**ẃ**aasan	pussy willows	**wh**	**wh**ere
*Front X	**x**	smax	bear, meat	no	equivalent
Back X	**x**	sna**x**	hawthorn berries	**x**	snac**k**
XW	**xw**	xwts'aa	blue facepaint	no	equivalent
Soft Y	**y**	ya'a	spring salmon	**y**	**y**awn
Hard Ý	**ý**	ýans	leaf/leaves	**ye**	**ye**s
Glottal Stop	**'**	gal'ink	storage box	**-**	uh**-**oh

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Appendix B. List of plant species observed and/or collected during the course of this research.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Trees									
Family: Pinaceae									
Abies	*amabilis*	Pacific silver fir	Old Greenville	464329	6093281	17	CB		
Abies	*amabilis*	Pacific silver fir	Logging rd. Gitwinksihlkw	487570	6122185	271		19Jul-10	CB/PB
Abies	*amabilis*	amabilis fir	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Picea	*sitchensis*	Sitka spruce	volcano trail	506438	6107284	563	CB/PB		
Picea	*sitchensis*	Sitka spruce	Tseax River	493460	6118365	51	CB/PB		
Picea	*sitchensis*	Sitka spruce	Tseax River	493460	6118365	51	CB/PB		
Pinus	*contorta*	lodgepole pine	volcano trail	506438	6107284	563	CB/PB		
Pinus	*contorta*	lodgepole pine	Tseax River	493460	6118365	51	CB/PB		
Tsuga	*heterophylla*	western hemlock	Gitwinksihlkw Fishwheel trail	486542	6116399	34	CB	23Aug-07	
Tsuga	*heterophylla*	western hemlock	Logging road. Gitwinksihlkw	487570	6122185	298	CB/PB?MA	19Jul-10	
Tsuga	*heterophylla*	western hemlock	Along Hwy. 113	483854	3886955	23		26Jul-10	CB/PB
Tsuga	*heterophylla*	western hemlock	Beaupre Rd.	499079	3889907	414			
Tsuga	*heterophylla*	western hemlock	Tseax River	493460	6118365	51	CB/PB		
Tsuga	*heterophylla*	western hemlock	Tseax River	493460	6118365	51	CB/PB		
Tsuga	*heterophylla*	western hemlock	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		

Appendix B. continued.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Tsuga	*mertensii*	mountain hemlock	volcano trail	506438	6107284	563	CB/PB	19Jul-06	
Family: Cupressaceae									
Thuja	*plicata*	western redcedar	Tseax River	493460	6118365	51	CB/PB		
Thuja	*plicata*	red cedar	Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB
Thuja	*plicata*	western redcedar	Tseax River	493460	6118365	51	CB/PB		
Deciduous species									
Family: Betulaceae									
Alnus	*rubra*	red alder	Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB /AA
Betula	*papyrifera*	paper birch	Tseax River	493460	6118365	51	CB/PB		
Betula	*papyrifera*	paper birch	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Family: Rosaceae									
Malus	*fusca*	Pacific crabapple	Gitwinksihlkw Fishwheel trail	486542	6116399	34		11Aug-08	CB
Malus	*fusca*	Pacific crabapple	Hot Springs trail	477379	6110258	33		28Jul-07	CB /PB
Family: Salicaceae									
Populus	*tremuloides*	trembling aspen	Tseax River	493460	6118365	51	CB/PB		
Populus	*balsamifera, ssp trichocarpa*	black cottonwood	Tseax River	493460	6118365	51	CB/PB		
Populus	*trichocarpa*	cottonwood	Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-08	CB

Appendix B. continued.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Shrubs									
Family: Aceraceae									
Acer	*glabrum*	Douglas maple	Tseax River	493460	6118365	51	CB/PB		
Family: Araliaceae									
Oplopanax	*horridus*	devil's club	Hot Springs trail	477379	6110258	33	CB		
Family: Betulaceae									
Corylus	*cornuta*	beaked hazelnut	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Family: Caprifoliaceae									
Linnea	*borealis*	twinflower	Gitlax̲t'aamiks, roadside	495071	6117007	107		26Jul-08	CB
Lonicera	*involucrata*	black twinberry	Gitwinksilhkw behind vill. hall	486549	6116399	42		8May-08	CB
Lonicera	*involucrata*	black twinberry	Gitwinksilhkw behind vill. hall	486549	6116399	42		16May-08	CB
Sambucus	*racemosa*	elderberry	Gitwinksilhkw N. side, foot bridge	485958	6116057	32		15May-08	CB /AA
Sambucus	*racemosa*	elderberry	Gitwinksilhkw, logging rd.	487854	6122104	271		22Jul-10	CB /PB
Symphoracarpus	*albus*	snowberry	Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB
Symphoracarpus	*albus*	snowberry	Gitwinksihlkw Fishwheel trail	486542	6116399	34		19Jul-07	CB
Viburnum	*edule*	higbush cranberry	Old Greenville Rd./nr. swamp	464752	6097706	12		27Jul-07	CB

Appendix B. continued.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Family: Celastraceae									
Paxistima	*myrsinites*	falsebox	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Paxistima	*myrsinites*	falsebox	Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB
Paxistima	*myrsinites*	falsebox	Gitwinksilhkw behind vill. hall	486549	6116399	42		15Jul-09	CB
Family: Cornaceae									
Cornus	*stolonifera*	red osier dogwood	Tseax River	493431	6118197	79	CB/PB		
Cornus	*stolonifera*	red osier dogwood	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Cornus	*stolonifera*	red osier dogwood	Tseax River	493460	6118365	51	CB/PB		
Cornus	*stolonifera*	red osier dogwood	Logging road. Gitwinksihlkw	486676	6121954	356		19Jul-10	CB/PB/MA
Cornus	*stolonifera*	red osier dogwood	Logging road. Gitwinksihlkw	487570	6122185	298		19Jul-10	
Family: Elaeagnaceae									
Shepherdia	*canadensis*	soapberry	Gitwinksilhkw N. foot bridge	485958	6116057	32		30Jul-10	CB
Family: Eriaceae									
Arctostaphylos	*uva-ursi*	kinnickinick	Gitwinksilhkw behind vill. hall	486549	6116399	42		16Jul-07	CB
Arctostaphylos	*uva-ursi*	kinnickinick	Gitwinksilhkw N. foot bridge	485958	6116057	32		18May-08	CB
Menziesia	*ferruginea*	false azalea	volcano trail	506438	6107284	563	CB/PB		
Menziesia	*ferruginea*	false azalea	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		

Appendix B. continued.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Menziesia	*ferrunginea*	false azalea	Logging road Gitwinksihlkw	487570	6122185	300		19Jul-10	CB/PB
Rhododendron	*groenlandi-cum*	Labrador tea	Old Greenville Rd.	464422	6093096	19		23Jun-08	CB
Vaccinium	*membrana-ceum*	black huckleberry	Logging road Gitwinksihlkw	487570	6122185	300		19Jul-10	
Vaccinium	*ovalifolium*	oval-leafed blueberry	Gitwinksilhkw cemetary rd.	486549	6116399	42		24Jul-10	
Vaccinium	*parviflorum*	thimbleberry	Logging road. Gitwinksihlkw	487570	6122185	300		19Jul-10	CB/PB/MA
Family: Grossulariaceae									
Ribes	*glandulosum*	stink currant	Old Greenville Rd.	467498	6098909	17		27Jun-09	CB
Ribes	?		Gitwinksihlkw, roadside	486240	6116500	51		16Jul-07	CB
Ribes	?		Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB
Ribes	?		Gitwinksihlkw Fishwheel trail	486542	6116399	34		23Aug-07	CB
Family: Rosaceae									
Amelanchier	*alnifolia*	Saskatoon berry	Gitwinksilhkw, S. side car bridge	486669	6116404	34		15May-08	CB
Amelanchier	*alnifolia*	Saskatoon berry	Tseax River	493460	6118365	51	CB/PB		
Amelanchier	*alnifolia*	Saskatoon berry	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Dryas	*drummondii*	yellow mountain avens	150 m east Gitwin.vehicle bridge, Gitwink	486669	6116404	34		15May-08	CB
Rosa	*nutkana*	Nootka rose	Gitwinksilhkw cemetary rd.	485836	6116335	40	CB	15Jul-07	CB

Appendix B. continued.

Genus	Species	Common Name	Location	Easting	Northing	Elevation (m)	observed	date	collector
Rosa	*nutkana*	Nootka rose	Gitwinksilhkw, lava beds	477379	6110258	33	CB	18May-08	CB
Rosa	*spp.*	wild rose	Tseax River	493460	6118365	51	CB/PB		
Rubus	*idaeus*	red raspberry	Tseax River	493460	6118365	51	CB/PB		
Rubus	*idaeus*	raspberry	Gitwinksilhkw , logging road	487570	6122185	271		19Jul-10	CB/PB
Rubus	*leucodermis*	black raspberry	Gitwinksilhkw bet. car&ft. bridg	487015	6115733	39		16Jul-07	CB
Rubus	*parviflorus*	thimbleberry	0.5 km N- road-side Laxgaltsap	462764	6099416	16		23Jun-08	CB
Rubus	*parviflorus*	thimbleberry	0.5 km N- road-side Laxgaltsap	462764	6099416	16	CB	26Jun-08	CB
Rubus	*parviflorus*	thimbleberry	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		CB/PB
Rubus	*pedatus*	five leaved bramble	Gitwinksilhkw, logging road	488154	6122058	231	CB/PB	19Jul-10	CB/PB
Rubus	*spectabilis*	salmonberry	Gitwinksilhkw, logging road	487570	6122185	298	CB/PB	19Jul-10	CB/PB
Rubus	*spectabilis*	salmonberry	Gitwinksilhkw, logging road	486676	6121954	356	CB/PB	19Jul-10	CB/PB
Sorbus	*scopulina*	western mountain ash	Gitwinksilhkw, rd. to cemetary	485836	6116385	90		24Jul-10	CB
Sorbus	*sitchensis*	Sitka mountain ash	Gitwinksilhkw, Irene's yard	485809	6116313	37		24Jul-10	CB
Spiraea	*douglasii*	hardhack	Gitwinksilhkw nr. Alice's n ditch	485740	6116290	37		19Jul-07	CB

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Family: Salicaceae									
Empetrum	*nigrum*	black crowberry	volcano trail	506438	6107284	563	CB/PB		
Salix	*arctica*	Arctic willow	volcano trail	506438	6107284	563	CB/PB		
Family: Poaceae									
Agrostis	*scabra*	tickle grass	volcano trail	506438	6107284	563	CB/PB		
Agrostis	*scabra*	tickle grass	Gitwinksilhkw, roadside	486240	6116500	51	CB	16Jul-07	
Agrostis	*exarata*	spike bentgrass	Nisga'a highway, gravelly roadside	491737	6117903	48	CB/PB		
Bromus	*sitchensis*	Alaska brome	near Gingolx, upper tidal flats	446283	6095621	27	CB/PB		
Bromus	*vulgaris/ciliatus ? ciliolatus*	brome	near Gingolx, upper tidal flats	446283	6095621	27	CB/PB		
Elymus	*glaucus*	blue wildrye	riverside	493431	6118197	79	CB/PB		
Festuca	*saximontana*	Rocky Mtn. fescue	volcano trail	506438	6107284	563	CB/PB		
Festuca	*compressa*	Rocky Mtn. fescue	Nisga'a highway	491737	6117903	48	CB/PB		
Festuca	*occidentalis*	western fescue	Gitwinksilhkw, Lookout trail	486371	6116654	123	CB/PB		
Festuca	*saximontana*	Rocky Mountain fescue	Tseax River	493460	6118365	51	CB/PB*		
Hordeum	*brachyantherum*	meadow barley	near Gingolx, upper tidal flats	446283	6095621	27	CB/PB		
Leymus	*mollis*	dune wildrye	nr.Gingolx mid-lower tidal flats	446283	6095621	27	CB/PB		

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Phleum	*pratense*	timothy	Nisga'a highway	491737	6117903	48	CB/PB		
Poa	*compressa*	Can. Bluegrass	volcano trail	506438	6107284	563	CB/PB		
Poa	*sp.*		Nisga'a highway	491737	6117903	48	CB/PB		
Poa	*compressa*	Can. bluegrass	Tseax River	493460	6118365	51	CB/PB		
Poa	*palustris ?*	fowl bluegrass	Gitwinksilhkw, Lookout trail	486371	6116654	123	CB/PB		
Trisetum	*spicatum*	spike trisetum	volcano trail	506438	6107284	563	CB/PB		
Family: Cornaceae									
Cornus	*canadensis*	bunchberry	Gitwinksilhkw, Lookout trail	486324	6116625	58	CB/PB		
Cornus	*canadensis*	bunchberry	Gitwinksihlkw, logging road	487570	6122185	298		19Jul-10	CB/PB/MA
Family: Cyperaceae									
Carex	*sitchensis*	Sitka sedge	near Gingolx,mid/ low tidal flats	446283	6095621	27	CB/PB		
Eriophorum	*angustifolium*	cottongrass	Old Greenville Rd	464329	6093281	17		21Jun08	CB
Eriophorum	*angustifolium*	cottongrass	Old Greenville Rd	464752	6097706	12		27Jul-07	CB
Scirpus	*microcarpus*	cattail	Hot Springs	477379	6110258	33		28Jul-07	CB/PB/AA
Family: Apiaceae									
Heraclum	*maximum*	cow parsnip	S. of Laxgaltsap	462757	6099432	97		24Jun08	CB

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Heraclum	*maximum*	cow parsnip	Old Greenville Rd	464329	6093281	17		27Jul-08	CB
Cicuta	*douglasii*	water hemlock	Old Greenville Rd	464329	6093281	17		27Jul-08	CB
Family: Apocynaceae									
Apocynum	*androsae-milfolium*	spreading dogbane	back of vill. hall, Gitwinksihlkw	485764	6116533	43		16Jul-07	CB
Apocynym	*androsae-milfolium*	spreading dogbane	back of vill. hall, Gitwinksihlkw	486549	6116399	42		11Aug-08	CB
Family: Araliaceae									
Aralia	*nudicaulis*	sarsparilla	Gitwinksihlkw Lookout trail	486324	6116625	58	CB/PB		
Aralia	*nudicaulus*	sarsparilla	Gitwinksihlkw Fishwheel trail	486542	6116399	34		11Aug-08	CB/AA
Family: Asteraceae									
Achillea	*millefolium*	yarrow	Nisga'a highway	491737	6117903	48	CB/PB		
Achillea	*millefolium*	yarrow	roadside Gitlaxt'aamiks	495071	6117007	107		23Aug-08	CB
Achillea	*millefolium*	yarrow	roadside Gitwinksihlkw	486676	6121954	35		16Jul-07	CB
Achillea	*millefolium*	yarrow	roadside Laxgaltsap	462661	6099216	17		26Jun-08	CB
Anaphalis	*margarit-acea*	pearly everlasting	back of vill. hall, Gitwinksihlkw	486549	6116399	42		19Aug-07	CB
Anaphalis	*margarit-acea*	pearly everlasting	back of vill. hall, Gitwinksihlkw	486549	6116399	42		16Jul-07	CB
Conyza	*canadensis*	horseweed	Nisga'a highway	491737	6117903	48	CB/PB		
Leucanthmum	*vulgare*	oxeye daisy	Tseax River	493460	6118365	51	CB/PB		

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Family: Crassulaceae									
Sedum	*divergens*	Pacific stonecrop	Tseax River	493460	6118365	51	CB/PB		
Family: Fabaceae									
Lathyrus	*nevadensis*	purple peavine	Gitwinksihlkw nr. WWN/midslope	485893	6116180	32		15May-08	CB
Lathyrus	*nevadensis*	purple peavine	back of vill. hall, Gitwinksihlkw	486549	6116399	42		16Jul-07	CB
Vicia	*americana*		back of vill. hall, Gitwinksihlkw	486549	6116399	42		16Jul-07	CB
Trifolium	*hybridum*	alsike clover	Nisga'a highway	491737	6117903	48	CB/PB		
Family: Gentianaceae									
Centaurium	*sp.*		Nisga'a highway	491737	6117903	48	CB/PB		
Family: Lamiaceae									
Prunella	*vulgaris*	self-heal	Gitwinksihlkw roadside	486676	6121954	35		16Jul-07	CB
Family: Liliaceae									
Disporum	*hookerii*	hooker's fairy bells	Gitwinksihlkw, forest behind hall	486549	6116399	42		8May-08	CB
Disporum	*hookerii*	hooker's fairy bells	Fishwheel trail, Gitwinksihlkw	486542	6116399	34		23Aug-07	CB
Disporum	*hookerii*	hooker's fairy bells	Fishwheel trail, Gitwinksihlkw	486542	6116399	34		19Jul-07	CB
Fritillaria	*camschatcen-sis*	chocolate lily	Laxgaltsap cemetary	462759	6098529	17		4Jul-08	CB/AA
Fritillaria	*camschatcen-sis*	chocolate lily	Gingolx, swamp near school	438758	6094636	9		8May-08	CB/AA

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Maianthemum	*dilatatum*	false-lily of the valley	Hwy. 113, edge of side channel.	483854	3886955	23		26Jul-10	MP/CB
Maianthemum	*dilatatum*	false-lily of the valley	Hwy. 113, edge of side channel.	483854	3886955	23		26Jul-10	MP/CB
Smilacina	*racemosa*	false Solomon's seal	Gitwinksihlkw, Fishwheel trail	486542	6116399	34		11Aug-08	CB/AA
Smilacina	*racemosa*	false Solomon's seal	Gitwinksihlkw, Fishwheel trail	486542	6116399	34		11Aug-08	CB/AA
Smilacina	*racemosa*	false Solomon's seal	Hotsprings trail	477379	6110258	33		28Jul-07	CB/AA/PB
Streptopus	*roseus*	rosy twistedstalk	Gitwinksihlkw, Fishwheel trail	486542	6116399	34		11Aug-08	CB
Streptopus	*roseus*	rosy twistedstalk	Hot Springs trail	477379	6110258	33		28Jul-07	CB
Streptopus	*roseus*	rosy twistedstalk	Hwy. 113, edge of side channel.	483854	3886955	23		26Jul-10	MP/CB
Streptopeus	*roseus*	rosy twistedstalk	Kitsault	508735	6147287	236		19Jul-10	
Veratrum	*viride*	false hellebore	Greenville	462669	6098383	17		16Jul-07	CB/AA
Veratrum	*viride*	false hellebore	Beaupre Rd.	499079	3889907	414			CB/AA
Family: Menyanthaceae									
Menyanthes	*trifoliata*	buckbean	Old Greenville Rd.	464422	6093096	19		21Jun-07	CB
Family: Monotropaceae									
Pterospora	*andromedea*	pine drops	Gitwinksihlkw. Lookout trail	486301	6116726	137	CB/PB	19Jul-06	
Family: Onagraceae									
Epilobium	*angustifolium*	fireweed	volcano trail	506438	6107284	563	CB/PB		

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Epilobium	*angustifolium*	fireweed	riverside	493431	6118197	79	CB/PB		
Epilobium	*angusti-folium*	fireweed	N Gitlaxt'aamiks, rd.side	462764	6099416	16		8Aug-08	CB
Epilobium	*angustifolium*	fireweed	Gitwinksihlkw, rdside, nr bridge	486173	6116433	48		16May-09	CB
Epilobium	*angustifolium*	fireweed	Gitwinksihlkw, rd.side nr. Bridge	486173	6116433	48		16May-09	CB
Epilobium	*ciliatum*	purple-leaved willowherb	Old Greenville Rd	464329	6093281	17			CB
Family: Orchidaceae									
Goodyera	*oblongifolia*	rattlesnake plantain	Fishwheel trail, Gitwinksihlkw	486542	6116399	34		23Aug-07	CB
Goodyera	*oblongifolia*	rattlesnake plantain	Gitwinksihlkw, behind vill. hall	486549	6116399	42		24Jul-10	CB
Plantanthera	*diltatum*	white bog-orchid	Old Greenville Rd	464329	6093281	17		27Jul-07	CB
Family:Polygonaceae									
Polygonum	*cuspidatum*	Japanese knotweed	near Gingolx	438809	6094660	17		19Jul-06	
Family: Pyrolaceae									
Chimaphila	*umbellata*	prince's pine	back of vill. hall, Gitwinksihlkw	486549	6116399	42			CB
Chimaphila	*umbellata*	prince's pine	Fishwheel trail, Gitwinksihlkw	486542	6116399	34		11Aug-08	CB/AA
Family: Ranunculaceae									
Actaea	*rubra*	baneberry	Gitwinksihlkw, Lookout trail	486301	6116726	137	CB/PB	21Jul-06	
Actaea	*rubra*	baneberry	Hot Springs trail	477379	6110258	33		28Jul-07	CB/PB

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Ranunculus	*acris*	buttercup	NE entrance to Laxgaltsap	462670	6099157	19		24Jun-08	CB/PB
Family: Rosaceae									
Aruncus	*dioicus*	goat's beard	NE entrance to Laxgaltsap	495071	6117007	107		23Jun-08	CB
Aruncus	*dioicus*	goat's beard	road/ Old Aiyan- sh boat ramp	495071	6117007	107		26Jul-08	CB
Aruncus	*dioicus*	goat's beard	Old GreenvilleRd	464329	6093281	17		21Jun-08	CB
Potentilla	*anserina*	silverweed	Old GreenvilleRd	464329	6093281	17		23Jun-08	CB
Comarum	*palustre*	marsh cinquefoil	Old Greenville Rd	464329	6093281	17		27Jul-08	CB
Family: Rubiaceae									
Galium	*triflorum*	sweet scented bedstraw	back of vill. hall, Gitwinksihlkw	485764	6116533	43		16Jul-07	CB
Family: Saxifragaceae									
Castilleja	*miniata*	common red paintbrush	back of vill. hall, Gitwinksihlkw	485764	6116533	43		16Jul-07	CB
Family: Scrophulariaceae									
Heuchera	*glabra*	smooth alumroot	volcano trail	506438	6107284	563	CB/PB		
Heuchera	*glabra*		Tseax River	493460	6118365	51	CB/PB		
Leptarrhena	*pyrolifolia*	leatherleaf saxifrage	W. branch Beaupre Rd.	499302	6106234	675		22Jul-10	CB/MA
Saxifraga	*bronchialis*	yellowdot saxifrage	Tseax River	493460	6118365	51	CB/PB		
Saxifraga	*bronchialis*	yellowdot saxifrage	volcano trail	506438	6107284	563	CB/PB		

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Saxifraga	*tricuspidata?*	three-toothed saxifrage	Tseax River	493460	6118365	51	CB/PB		
Saxifrage	*occidentalis*	western saxifrage	W. branch Beaupre Rd.	499302	6106234	675		22Jul-10	CB/MA
Family: Typhaceae									
Typha	*latifolia*	cattail	Hot Springs trail	477379	6110258	33		28Jul-07	CB
Ferns									
Adiantum	*pedatum*	maidenhair fern	logging road Gitwinksihlkw	488154	6122058	231		19Jul-10	CB/PB
Athyrium	*filix-femina*	ladyfern	Hot Springs trail	477379	6110258	33		11Aug-08	CB
Crypotgramma	*crispa*	parsley fern	Intersection Hwy. 113 and Gitwinksihlkw, lava bed ditch	487275	6115604	39		7Jul-07	CB
Cryptogramma	*crispa*	parsley fern	volcano trail	506438	6107284	563	CB/PB		
Cryptogramma	*crispa*	parsley fern	Tseax River	493460	6118365	51	CB/PB*		
Dryopteris	*expansa*	spiny woodfern	Beaupre Rd.	498909	498909	303			CB
Dryopteris	*felix-mas*	spiny woodfern	Gitwinksihlkw, back of vill. Hall	486549	6116399	42			CB
Gymnocarpium	*dryopteris*	oak fern	volcano trail	506438	6107284	563	CB/PB		
Gymnocarpium	*dryopteris*	oak fern	rdside Hwy. 113	483854	3886955	23		26Jul-10	MP
Gymnocarpium	*dryopteris*	oak fern	Tseax River	493460	6118365	51	CB/PB		
Polypodium	*glycyrrhiza*	licorice fern	Gitwink.lavabeds under rock	477379	6110258	33		21Aug-07	CB

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Polypodium	*glycyrrhiza*	licorice fern	Tseax River	493460	6118365	51	CB/PB		
Polystichum	*andersonii*	sword fern		477379	6110258	33		28Jul-07	CB
Polystichum	*sp.*		volcano trail	506438	6107284	563	CB/PB		
Pteridium	*aqulinum*	bracken	Rd. to OldAiyan-sh boatramp	495071	6117007	107		26Jul-08	CB
Pteridium	*aqulinum*	bracken	Old Greenville Rd.	464329	6093281	17		21Jun-08	CB
Pteridium	*aqulinum*	bracken	Gitwinksihlkw, roadside ditch	485809	6116313	35		17Jul-07	CB
Pteridium	*aquilinum*	bracken	Gitwinksilhkw , Lookout trail	486324	6116625	58	CB/PB		CB
Club Moss									
Equisetum	*arvense*	horsetail	logging road Gitwinksihlkw	488154	6122058	231		19Jul-10	CB/PB/MA
Lycopodium	*annotinum*	stiff clubmoss	volcano trail	506438	6107284	563	CB/PB		
Mosses/Liverworts									
Conocephalum	*conicum*	seal's tongue	W branch Beaupre Rd.	499302	6106234	675		22Jul-10	CB/MA
Hylecomium	*splendens*	step moss	Tseax River	493460	6118365	51	CB/PB		
Hylocomium	*splendens*	step moss	volcano trail	506438	6107284	563	CB/PB		
Pleurozium	*shcreberi*	red stem feather moss	volcano trail	506438	6107284	563	CB/PB		
Lichens									
Cladina	*alpestris*	star nosed reindeer	volcano trail	506438	6107284	563	CB/PB		

Appendix B. continued.

Genus	Species	Common name	Location	Easting	Northing	Elevation (m)	Observed	Date	Collector
Cladina	*alpestria*	star nosed reindeer	Tseax River	493460	6118365	51	CB/PB		
Lobaria	*pulmonaria*	lungwort	Tseax River	493460	6118365	51	CB/PB		
Lobaria	*pulmonaria*	lungwort	Tseax River	493460	6118365	51	CB/PB		
Stereocaulon	*paschale*	cottontail foam	volcano trail	506438	6107284	563	CB/PB		
Stereocaulon	*paschale*	cottontail foam	Tseax River	493460	6118365	51	CB/PB		

Collectors: CB: Carla Burton; AA: Alice Azak; PB: Phil Burton; MA: Melanie Andrej; MP: Margo Penner

Appendix C. Plants discussed during the research.

Common name	Scientific	nomenclature		Growth form
	Genus	**Species**	**Family**	
subalpine fir, balsam	*Abies*	*lasciocarpa*	Pinaceae	tree
Pacific silver fir, balsam	*Abies*	*amabilis*	Pinaceae	tree
spruce	*Picea*	*sitchensis*	Pinaceae	tree
lodgepole pine	*Pinus*	*contorta*	Pinaceae	tree
western hemlock	*Tsuga*	*heterophylla*	Pinaceae	tree
mountain hemlock	*Tsuga*	*mertensiana*	Pinaceae	tree
Douglas-fir	*Pseudotsuga*	*menziesii*	Pinaceae	tree
western redcedar	*Thuja*	*pllicata*	Cupressaceae	tree
yellow cedar	*Chamaecyparis*	*nootkatensis*	Cupressaceae	tree
paper birch	*Betula*	*papyrifera*	Betulaceae	tree
red alder	*Alnus*	*rubra*	Betulaceae	tree
Pacific crabapple	*Malus*	*fusca*	Rosaceae	tree
bitter cherry	*Prunus*	*emarginata*	Rosaceae	tree
choke cherry	*Prunus*	*virginiana*	Rosaceae	tree
trembling aspen	*Populus*	*tremuloides*	Salicaceae	tree
black cottonwood	*Populus*	*trichocarpa*	Salicaceae	tree
western yew	*Taxus*	*brevifolia*	Taxaceae	tree
Douglas maple	*Acer*	*glabrum*	Aceraceae	tree/shrub
devil's club	*Oplopanax*	*horridus*	Araliaceae	shrub
hazelnut	*Corylus*	*cornuta*	Betulaceae	shrub
honeysuckle, twinberry	*Lonicera*	*involucrata*	Caprifoliaceae	shrub
red elderberry	*Sambucus*	*racemosa*	Caprifoliaceae	shrub
snowberry	*Symphoricarpos*	*albus*	Caprifoliaceae	shrub
highbush cranberry	*Viburnum*	*edule*	Caprifoliaceae	shrub
falsebox	*Paxistima*	*myrsinites*	Celastraceae	shrub
bunchberry	*Cornus*	*canadensis*	Cornaceae	shrub
red-osier dogwood	*Cornus*	*stolonifera*	Cornaceae	shrub
common juniper	*Juniperus*	*communis*	Cupressaceae	shrub
soapberry	*Shepherdia*	*canadensis*	Elaeagnaceae	shrub
wolf willow, silverberry	*Eleagnus*	*commutata*	Elaeagnaceae	shrub
black crowberry	*Empetrum*	*nigrum*	Empetraceae	shrub
kinnikinnick	*Arctostaphylos*	*uva-ursi*	Ericaceae	shrub
salal	*Gaultheria*	*shallon*	Ericaceae	shrub

Appendix C. continued.

Common name	**Scientific**	**nomenclature**		**Growth form**
	Genus	**Species**	**Family**	
Labrador tea, swamp tea	*Ledum*	*groenlandicum*	Ericaceae	shrub
false azalea, fool's huckleberry	*Menziesia*	*ferruginea*	Ericaceae	shrub
bog cranberry	*Oxycoccus*	*oxycoccos*	Ericaceae	shrub
Alaskan blueberry	*Vaccinium*	*alaskaense*	Ericaceae	shrub
dwarf blueberry,	*Vaccinium*	*caespitosum*	Ericaceae	shrub
black huckleberry	*Vaccinium*	*membranaceum*	Ericaceae	shrub
oval-leafed blueberry	*Vaccinium*	*ovalifolium*	Ericaceae	shrub
red huckleberry	*Vaccinium*	*parviflorum*	Ericaceae	shrub
lingonberry, low-bush cranberry	*Vaccinium*	*vitis-idaea*	Ericaceae	shrub
stink currant	*Ribes*	*bracteosum*	Grossulariaceae	shrub
black gooseberry	*Ribes*	*lacustre*	Grossulariaceae	shrub
trailing black currant	*Ribes*	*laxiflorum*	Grossulariaceae	shrub
Saskatoon	*Amelanchier*	*alnifolia*	Rosaceae	shrub
black hawthorn	*Crataegus*	*douglasii*	Rosaceae	shrub
yellow mountain-avens	*Dryas*	*drummondii*	Rosaceae	shrub
Nootka rose	*Rosa*	*nutkana*	Rosaceae	shrub
cloudberry	*Rubus*	*chamaemorus*	Rosaceae	shrub
red raspberry	*Rubus*	*idaeus*	Rosaceae	shrub
black raspberry	*Rubus*	*leucodermis*	Roaceae	shrub
thimbleberry	*Rubus*	*parviflorus*	Rosaceae	shrub
five-leaf bramble	*Rubus*	*pedatus*	Rosaceae	shrub
salmonberry	*Rubus*	*spectabilis*	Rosaceae	shrub
trailing wild blackberry	*Rubus*	*ursinus [?]pubscens*	Rosaceae	shrub
Sitka mountain-ash	*Sorbis*	*sitchensis*	Rosaceae	shrub
hardhack	*Spiraea*	*douglassii*	Rosaceae	shrub
willow	*Salix*		Salicaceae	shrub/tree
pussy willow	*Salix*	*discolour* or other		shrub/tree
water hemlock	*Cicuta*	*douglasii*	Apiaceae	forb
cow parsnip	*Heracleum*	*lanatum*	Apiaceae	forb
water parsnip	*Sium*	*suave*	Apiaceae	forb
spreading dogbane	*Apocynum*	*adrosaemifolia*	Apocynaceae	forb
skunk cabbage	*Lysichiton*	*americanum*	Araceae	forb
common yarrow	*Achillea*	*millefolium*	Asteraceae	forb

Appendix C. continued.

Common name	**Scientific**	**nomenclature**		**Growth form**
	Genus	**Species**	**Family**	
pearly everlasting	*Anaphalis*	*margaritaceae*	Asteraceae	forb
burdock	*Arctium*	*minus*	Asteraceae	forb
oxeye daisy	*Chrysanthemum*	*leucanthemum*	Asteraceae	forb
dandelion	*Taraxacum*	*officinale*	Asteraceae	forb
lava berries	*Sedum*	*divergens*	Crassulaceae	forb
roundleaf sundew	*Drosera*	*rotundifolia*	Droseraceae	forb
creamy peavine	*Lathyrus*	*ochreleucus*	Fabaceae	forb
lupine	*Lupinus*	spp.	Fabaceae	forb
wild mint	*Mentha*	*arvensis*	Labiatae	forb
self-heal	*Prunella*	*vulgaris*	Labiatae	forb
nodding onion	*Allium*	*cernuum*	Liliaceae	forb
Queen's cup	*Clintonia*	*uniflora*	Liliaceae	forb
chocolate lily, riceroot	*Fritillaria*	*camschatcensis*	Liliaceae	forb
false lily-of-the-valley	*Maianthemum*	*dilatatum*	Liliaceae	forb
false Solomon's-seal	*Maianthemum*	*racemosa*	Liliaceae	forb
Hooker's fairybells	*Prosartes* syn .*Disporum*	*hookeri*	Liliaceae	forb
twisted stalk	*Streptopus*	*amplexifolius/roseus*	Liliaceae	forb
false hellebore	*Veratrum*	*viride*	Liliaceae	forb
buckbean	*Menyanthes .*	*trifoliata L.*	Menyanthaceae	forb
Indian pipe	*Monotropa*	*uniflora*	Monotropaceae	forb
yellow pond lily	*Nuphar*	*polysepala*	Nymphaeaceae	forb
fireweed	*Epilobium*	*angustifolium*	Onagraceae	forb
fairy slipper	*Calypso*	*bulbosa*	Orchidaceae	forb
common plantain	*Plantago*	*major*	Plantaginaceae	forb
western dock	*Rumex*	*acetosella*	Polygonaceae	forb
prince's pine	*Chimaphila*	*umbellata*	Pyrolaceae	forb
one-flowered wintergreen	*Moneses*	*uniflora*	Pyrolaceae	forb
red baneberry	Actaea	*rubra*	Ranunculaceae	forb
red columbine	*Aquilegia*	*formosa*	Ranunculaceae	forb
goat's beard	*Aruncus*	*dioicus*	Rosaceae	forb
marsh cinquefoil	*Comarum* (syn. *Potentilla)*	*palustres (palustris)*	Rosaceae	forb
wild strawberry	*Fragaria*	*virginiana*	Rosaceae	forb
large-leaved avens	*Geum*	*macrophyllum*	Rosaceae	forb

Appendix C. continued.

Common name		**Scientific nomenclature**		**Growth form**
	Genus	**Species**	**Family**	
silverweed	*Potentilla*	*anserina*	Rosaceae	forb
bedstraw	*Galium*	*various species*	Rubiaceae	forb
scarlet paintbrush	*Castileja*	*miniata*	Scrophulariaceae	forb
common cattail	*Typha*	*latifolia*	Typhaceae	forb
stinging nettle	*Urtica*	*dioica*	Urticaceae	forb
eelgrass	*Zostera*	*marina*	Zosteraceae	aquatic forb
spiny wood fern	*Dryopteris*	*expansa*	Dryopteridaceae	fern
ladyfern	*Athyrium*	*filix-femina*	Dryopteridaceae	fern
bracken	*Pteridium*	*aquilinum*	Denstaedtiaceae	fern
licorice fern	*Polypodium*	*glycyrrhiza*	Polypodiaceae	fern
maiden-hair fern	*Adiantum*	*aleuticum*	Pteridiaceae	fern
parsley fern	*Cryptogramma*	*acrostichoides*	Pteridiaceae	fern
horsetail	*Equisetum*	*arvense/, pratense,*	Equisetaceae	fern ally
horsetail species	*Equisetum.*	*hyemale, fluviatile*	Equisetaceae	fern ally
stiff clubmoss	*Lycopodium*	*annotinum*	Lycopodiaceae	fern ally/club moss
running clubmoss	*Lycopodium*	*clavatum*	Lycopodiaceae	fern ally/club moss
Pacific fir-moss/Chinese moss	*Huperzia*	*chinensis*	Lycopodiaceae	fern ally/club moss
Alpine fir-moss/Pacific clubmoss	*Huperzia*	*haleakalae*	Lycopodiaceae	fern ally/club moss
grasses	various		Poaceae	graminoid
small-flowered bullrush	*Scirpus*	*microcarpus*	Cyperaceae	graminoid
sedge	*Carex*	spp.	Cyperaceae	graminoid
mosses	various	various	various	bryophyte
peat moss	*Sphagnum*	spp.	Sphagnaceae	bryophyte
juniper haircap moss	*Polytrichum*	*juniperinum*	Polytrichaceae	bryophyte
large leafy moss	*Rhizomnium*	*glabrescens*	Mniaceae	bryophyte
snake liverwort	*Conicephalum*	*conicum*	Conocephalaceae	bryophyte
lung liverwort	*Marchantia*	*polymorpha*		bryophyte
lichens				lichens
witch's hair	*Alectoria*	*sarmentosa*		lichens
speckled horse hair	*Bryoria*	*lanestris*		lichens
reindeer lichen	*Cladina* .	spp.		lichens
cup lichen	*Cladonia*	spp.		lichens
wolf moss	*Letharia*	*vulpina*		lichens

Appendix C. continued.

Common name	**Scientific**	**nomenclature**		**Growth form**
	Genus	**Species**	**Family**	
lungwort	*Lobaria*	*pulmonaria*	Lobariaceae	lichens
freckle pelt	*Peltigera*	*leucophlebia*		lichens
foam lichens	*Stereocaulon*	spp.		lichens
old man's beard	*Usnea*	*longissima*		lichens
orange rock lichen	*Xanthoria*	sp.		lichens
mushrooms				fungus
cauliflower mushroom	*Sparassis*	*crispa (Wulfen) Fr.*	Sparassidaceae	fungus
puffball	*Bovista*	*pila*	Lycoperdaceae	fungus
pine mushroom	*Tricholoma*	*magnivelare*	Tricholomataceae	fungus
red leaf spot, ghost's ears	*Exobasidium C116*	*vaccinii*	Exobasidiaceae	fungus
hemlock fungus	*Fomitopsis*	*pinicola*	Fomitopsidaceae	fungus
poplar fungus	*Phellinus*	*tremulae*	Hymenochaetaceae	fungus
angel hair, stringy seaweed	*Gracilaria* or *Gracilariopsis*	*lemaneiformis* or ?		brown aquatic algae
giant kelp	*Macrocystis* .	*integrifolia (?)*	Laminariaceae	brown aquatic algae
bull kelp	*Nereocystis*	*luetkeana*	Laminariaceae	brown aquatic algae
bladderwrack	*Fucus*	*gairdneri* or *sp.*	Fucaceae	brown aquatic algae
red laver seaweed	*Porphyra*	*abbottae*	Bangiaceae	brown aquatic algae

Appendix D. Sample data sheet for Nisga'a use of plants for food.

Nisga'a name:	alda (ho'oks)	ho'oks (alda)	seeks	sginist	giikw	giikw
Common name:	subalpine fir, balsam	Pacific silver fir, balsam	spruce	lodgepole pine	western hemlock	mountain hemlock
Genus:	*Abies*	*Abies*	*Picea*	*Pinus*	*Tsuga*	*Tsuga*
Species:	*lasciocarpa*	*amabilis*	*sitchensis*	*contorta*	*heterophylla*	*mertensiana*
Collaborator	**Food uses**	**Food uses**	**Food uses**	**Food uses**	**Food uses**	**Food uses**
One	no food use recalled	no food use recalled	pitched used as chewing gum, inner bark eaten [**haadiks**]	in spring outer bark removed thin slivers eaten, like honey; this is k**nown as** sk'anhix [*similar to tree name]	sun dry the inner bark store in **gal'ink**; before processing it's haadiks, after process -ing it's **ksuuẃ**; bark scraped with a knife called a hakalakw	recognized two different species of hemlock but unsure if different there is a different Nisga'a name for this species
Two	no food use recalled	no food use recalled	pitched used as chewing gum, also as a dessert; pounded and dried like seaweed, like hemlock too.	pine sap eaten, chewed like gum	inner hemlock bark taken in the spring, pounded and made into **ksuuẃ**	unsure if different from western hemlock
Three	does not recognize the word **alda**, but knows **ho'oks**; no food use recalled	does not recognize the word **alda**, but knows **ho'oks**; no food use recalled	take the bark off in thin strips and eat it right away; it might be called **haadiks**; don't cook it, like you do hemlock; chewed the pitch like gum	in May, take the bark off the pine tree in early morning with a knife, looks like big white ribbons; just eat it right there before it melts; called **sk'aanhix**	take the hemlock bark off, cook it and store it, eat it with grease; on this inner bark was stored, called **giikw**	plant not discussed
Four	no food use recalled	no food use recalled	no food use recalled	no food use recalled	all kinds of berries mixed with inner bark and eaten -- called **ksuuẃ**, it was stored in barrels;	plant not discussed

Appendix E. Sample data sheet for Nisga’a medicinal plant use.

Nisga'a name:	**haxwdakw**	**k’ookst**	**wa'ums**	**‘tsak’a tyaýtkw,**
Common name:	western yew	maple	devil's club	hazelnut
Genus:	*Taxus*	*Acer*	*Oplopanax*	*Corylus*
Species:	*brevifolia*	*glabrum*	*horridus*	*cornuta*
Collaborator	**Medicinal uses**	**Medicinal uses**	**Medicinal uses**	**Medicinal uses**
Four	yew wood stems boiled for 12 hours and air inhaled; drink concoction; mixed with devil's club for various ailments; yew wood comes in about 1 1'2 inch diameter; boiled with devil's club for some ailments; when taking medicine, it is a personal thing; don't share that you are taking it; be in right frame of mind; want to heal your body;	plant not discussed	a powerful medicine; uses roots, harvested and then boiled for 16 hours; his grandmother used roots only not the thorny stems; if you find stems without thorns you can use those too 1 1/2 to 2 inches in diameter; harvested Sept. to Feb; if you have to harvest in summer, only use roots; learned from grandmother Agnes Benson; used for all kinds of medicine; mixed with yew wood sometimes; knew someone who took it for a liver ailment	plant not discussed
Five	plant not discussed	plant not discussed	devil's club powerful when the flowers are on, you don't pick it then, the smell can overwhelm you; many medicinal uses;	plant not discussed
Six	plant not discussed	no medicinal use recalled	mixture of mint leaf, devil's club, cloves and **tiim laxlax'u** [labrador tea] simmered together to make a tea for arthritis; people who have cancer mix it with something and drink it; taken like a tonic when preparing for sporting events; no made into capsules that young people take; Lavinia mixes it with **tiim laxlax'u** as a tea for arthritis;	plant not discussed
Eight	plant not recalled	no medicinal use recalled	mother scraped off the outside bark off the stem and put the inner white part in a gallon jar with boiling water, left it until it's cold then used it as a all purpose medicinal drink; tastes bitter, like beer; good for asthma; picked when all the leaves are off and can be picked until the leaves open up again.	no medicinal use recalled
Nine	no medicinal use recalled	no use recalled	drink prepared from the bark [with spines taken off] taken to clean out your intestinal tract; drink juice also when you are run down or feeling "raggy"; his mother would say "**wa see maks” wa'ums**" and we would drink it.	plant not discussed

Appendix F. Sample data sheet for Nisga’a spiritual and ceremonial plant use.

Nisga'a name:	**ammḿaal**	**wa'ums**	**k’ots**	**ts’iks**
Common name:	black cottonwood	devil's club	false Solomon's seal	hellebore
Genus:	*Populus*	*Oplopanax*	*Maianthemum*	*Veratrum*
Species:	*trichocarpa*	*horridus*	*racemosa*	*viride*
Collaborator	**Spiritual uses**	**Spiritual uses**	**Spiritual uses**	**Spiritual uses**
One	no spiritual use recalled	used along and with **ts'iks** to perform **sisatkw** [hunting ritual to bring luck];	thought this might be the plant that was thrown in creek to keep the creek free of the ghosts of people whose bodies were thrown into the creek after death from smallpox.	roots dried and sliced to keep away evil spirits; bathed in roots to keep evil spirits away; roots prepared with devil's club for **sisatkw** [cleansing ritual before going hunting]; seeds for necklaces; for purification before hunting; brings good luck;
Two	buds put in house to freshen the air and to make you feel good; you appreciate them.	keeps bad spirits away; preparation for hunting for good luck, mix it with **ts'iks**, you smell the breeze, wherever there is **wa'ums**, you smell it, the game smell it, they don't smell you	no spiritual use recalled	use it for smudging, if you think you have bad omens in your home you smudge it out; use **wa'ums** with it, smolders and do it from corner to corner, do it for four days
Four	plant not discussed	spiritual use not discussed specifically, but said you have to have a spiritual attitude when using it for medicine.	plant not discussed	plant not discussed
Five	plant not discussed	spiritual use not discussed specifically, but said you have to have a spiritual attitude when using it for medicine.	plant not discussed	plant not discussed
Eight	no spiritual use recalled	brings good luck and can keep bad spirits away; 30 cm piece, with spines taken off put in all windows in her house.	no spiritual use recalled	mother used the roots, the same as with **wa'ums**, burned it and let it smoke all around the house for luck.
Nine	no spiritual use recalled	no spiritual use recalled.	plant recognized but no use recalled	plant recognized but no use recalled, said Alice Azak or his sisters would know about this plant.
Nineteen	plant not discussed	Some people dry it and grind it into powder and carry it in pouches for good luck and for medicine. You must talk to the plant, respect it and gather it at certain times to make it work well. Prepare for four days before you go collecting.	plant not discussed	some people used to grind up the seeds and use them in the bath or for luck

Appendix G. Sample data sheet for Nisga'a technological plant use.

Nisga'a name:	**seeks**	**simgan**	**haawak'**	**ammáal**	**hańook, ho'ok**
Common name:	spruce	western red cedar	paper birch	black cottonwood	cow parsnip
Genus:	*Picea*	*Thuja*	*Betula*	*Populus*	*Heracleum*
Species:	*sitchensis*	*pllicata*	*papyrifera*	*trichocarpa*	*lanatum*
Collborator	**Technological uses**	**Technological uses**	**Technological uses**	**Technological uses**	**Technological uses**
Eight	dad used to make hammers from spruce for pounding anything.	racks for drying berries made from cedar; berries dried on these in the sun or over a fire.	plant not discussed	**ammáa**l means "good for canoes" and was used to make canoes; fluff not used for anything.	plant not discussed
Nine	Ancient story says that at the time of the flood, strong branches of this tree were used like anchors, attached to the canoe, then jammed in between rocks to stop the canoes floating away; in the old stories, this also is the tree that provided the pitch for burning.	late father called this tree "The Tree of Life" because of it's many uses;, branches, bark, sap and wood itself were used; canoes, totem poles carved from wood	a very hard wood, very hot burning so good for fire; also used for making wooden spoons and other utensils	cottonwood used to smoke salmon because it doesn't burn hot; really thick bark on older trees burn like coal; sometimes canoes were made from this tree	plant not discussed
Thirteen	branches used to get spawning salmon & herring eggs; [perhaps both hemlock and spruce used?] seeks is the one we always use	branches used for sticks for hanging eulachons to dry, still uses them; also used inner bark for baskets;	no use recalled	no use recalled., although she remembers in-laws using it	hard stalks are hard, are made into whistles
Twenty-two	knots from spruce tree used to girdle the tree before cutting it down, allows tree to dry before cutting it. Also marked the tree so no one else could cut it. Took five to six years for tree to dry and fall.	used for making boxes [**gal'ink**], rope, mats, baskets, canoes, it's called the tree of life; boughs for emergency sleeping mattresses, cedar planks, in the old days if they can't cut them down right away, they take slabs off the standing tree to start making a canoe;	used for firewood, burns well in the stove, can burn all night if dry; used for making sleighs, made in a certain way, without the use of nails, whole tree used, had to be able to bend	used to make canoes; dry rotten wood used for smoking salmon	no technological use recalled