Some contributions to the Stó:lō Ethnobotany

Introduction

I had the pleasure of participating in the Ethnohistory Field School during the Spring of 2009. Initially, the Stó:lō Nation invited me to do a project on their ethnobotanical garden and make some recommendations for landscaping around a newly constructed care center for Stó:lō elders. While I began research related to those initiatives, I couldn't keep myself away from the archives, which contain a plethora of dusty interview transcripts rich in ethnobotanical knowledge. I also had the opportunity to conduct interviews with three Stó:lō elders. These interviews were full of so many discoveries that I was obliged to include in this paper a few rich ethnobotanical accounts that are not directly related to the ethnobotany garden. Therefore, I have adjusted the topic of my paper slightly to accommodate them.

The first section of this paper is a history of the major pieces of literature pertinent to the ethnobotany of the Stó:lō . Next I describe the Stó:lō territory and seasonal round as a means of setting up a discussion of intensive resource use and management. This discussion includes two detailed examples directly from one of my interviews. Finally, I delve into my assigned subject of the ethnobotany garden and use the archived interviews I read as a platform for assessing the composition of the ethnobotany garden.

A brief historiography of Stó:lō ethnobotany

Throughout the 201 years since Simone Fraser explored the lower reaches of the Fraser River, additional explorers, settler Canadians, linguists, ethnographers, Stó:lō employees and others, have made written records of the Stó:lō use of plants and animals.

The earliest class of writings to contain ethnobiological information were the reports and journals of early explorers. The Simon Fraser expedition arrived in Stó:lō territory on June of 27, 1808 and traveled through for about two weeks. During this time descriptions of the food given to them by the people they encountered are frequent (Lamb 1960, p97). These accounts are often too vague to identify the species of plants or animals that they ate, but meals often included dried berries, roots, fish, and oil, which may be an accurate reflection of the traditional Stó:lō diet.

Two decades after Simon Fraser retraced his path back up the Fraser Canyon, the Hudson Bay Company established Fort Langley. Part of their mandate was to keep a journal of the weather, trade, and travel. This journal was maintained from 1827 though 1830 and contains references to salmon, sturgeon, cedar bark, berries, deer, waterfowl, and wapato. (Suttles 1998)

One of the first reports that explicitly focused on the aboriginal people was made by Captain Wilson. Written like the ethnological reports of the early 20th century,

Wilson describes the people that inhabited present day southern Vancouver Island and the British Columbia mainland. He included a couple pages of ethnobotanical notes that describe what food was eaten and how it was acquired. (Wilson 1866, p282-284)

The last explorer journal I reviewed was by Henry Custer. Custer was a topographer that was hired by the Border commission to survey the North Cascades in the vicinity of the 49th parallel. Custer made six expeditions into the North Cascades (National Park Service 1999) with the aid of aboriginal guides and porters. He wrote a report in 1866 that contains his observation of landscape burning, canoe and raft construction, cedar bark huts, mountain goats, trout fishing, and blueberries that were so delicious that his guides nearly deserted him (Custer 1866).

At the end of the 19th century and early 20th century the science of ethnography began to flourish, and many professional academic ethnographers undertook field work in the Fraser Valley. Scholars such as Franz Boas (1887, 1894) and Charles Hill-Tout (1904,1905), documented the food, medicine, and material culture as part of their broader surveys of Stó:lō life. While these do contain some valuable plant accounts, they frequently generalize plant species as berries or roots, making precise interpretation difficult. This may have been due to the scholars' limited knowledge of botany, confusion resulting from the huge diversity of useful plants, or a dearth of female informants, the primary holders of plant knowledge.

Stó:lō research from the middle of the 20th century includes some significant contributions by resident and regional ethnographers. The first of these was the amateur ethnographer Oliver Wells (1987) who lived in Chilliwack and conducted 46 interviews with 16 elders in the 1950s and 60s. A number of these interviews are rich with ethnobotanical information. Wells was particularly focused on documenting language and he occasionally interrupts plant accounts to ask for the plant name. On the other hand, he did pursue some ethnobotanical topics in great detail, such as canoe making. The next ethnographer in this category was Erna Gunther. Gunther was a student of Franz Boas. Though Gunther didn't work directly with the Stó:lō , she worked with other Salishan people and wrote the first publication explicitly on ethnobotany in the region which is titled Ethnobotany of Western Washington (1945). She taught at the University of Washington and her students included Wayne Suttles and Wilson Duff.

Wayne Suttles was a professor at the University of Washington. Suttles devoted his life's work to understanding the Salish and frequently includes ethnobotanical accounts in his work, such as his 1955 publication on the Katzie (Suttles 1955). Suttles was also a Salishan linguist and documented several plant names.

Wilson Duff was another student of Erna Gunther's at the University of Washington and wrote his thesis on the Stó:lō ethnography. He took extensive field notes. These field notes (Duff 1949-50) and a 1952 (Duff 1952) publication

based on his thesis work with the Stó:lō , serve as the backbone for much of the ethnobotanical work with the Stó:lō as they include most of the useful plants, brief descriptions of how they were used, and their Halkomelem names.

Twenty years later in 1971, Nancy Turner published an ethnobotany of the Coast Salish of Vancouver Island, which includes a comprehensive list of plants, with their names and uses. Four years later she published Food Plants of Coastal British Columbia Indians (Turner 1975), which focuses on edible plants and expands on how they were generally used by First Peoples along the coast.

In the late 1970s and early 80s the Coqualeetza Training Center put out a series of five educational publications on Stó:lō hunting (1978) fishing (1979), plant gathering (1981) ethnobotany (1982) and use of cedar (1983). With the exception of 1982 Upper Stó:lō Ethnobotany, these booklets target children and in doing so represent an attempt by the Stó:lō to revitalize traditional knowledge. They also coincide with a shift in the field of ethnobiology towards supporting research agendas determined by aboriginal communities with aboriginal authorship.

In 1990, Turner collaborated with Thompson River Elders Laurence C. Thompson, M. Terry Thompson and, Annie Z. York to write a book on the Thompson ethnobotany (Turner et al 1990). This work is useful for understanding Stó:lō ethnobotany because of the close ties between the Thompson and the Stó:lō . For example, coauthor York spend a lot of her childhood on Stó:lō reserves. This ethnobotany is filled with detailed primary source accounts of plant use.

Most recently Kevin Washbrook, produced a paper titled “An introduction to the ethnobotany of the Stó:lō people in the area between New Westminster and Chilliwack on the Fraser River (Washbrook 1995).” Washbrook paper draws from all the Stó:lō ethnobotanical sources published prior to 1995.

While my paper made a survey of all of the sources mentioned above, special emphasis is placed on primary Stó:lō plant use accounts. I draw heavily from 25 interview transcripts from 33 Stó:lō elders, many of whom participated in Traditional Use Survey’s conducted by the Stó:lō Nation.[1] I also conducted three interviews with Stó:lō elders Ralph George, Rene Peter, and Isadore Charters to elicit specific details about plants and other topics that are emphasized in this paper.

[1] The objective of the Traditional Use Surveys was to document important resource sites in the Sto:lo territory (Washbrook et al 1998). While many useful species are mentioned in these surveys, details for where they are found are emphasized over how they are/were used. Of the approximately 187 Traditional Use Survey’s, the author only had time to review 25.

Physical Environment

The Stó:lō identify themselves with the lower reaches of the Fraser River. The Stó:lō territory is well defined by the Fraser River watershed downriver from Spuzzum. The world Stó:lō means "river" and the Stó:lō consider themselves to be the people of the river (Carlson 2001, pp 2,24) which is fitting given the geographic centrality and the economic importance of the Fraser River. Calling the Fraser *the* River may seem ethnocentric, but the Fraser River is the biggest river in British Columbia both by length and water volume (Wikepedia.org 2009), a fact that was recognized by other First Nations[2].

Stó:lō territory is markedly diverse. Elevations ranged from sea level in the Strait of Georgia to 2,104 meters at the top of Mt. Cheam. Mean annual precipitation ranges from just under 1000 mm in the south east corner of the Fraser valley and increase with elevation depositing about 1600 mm in Chilliwack and over 4600 mm in the Golden Ears Provincial Park (Taylor and Langlois 2000). The low and relatively dry Fraser delta supports a Coastal Doug-Fir Ecosystem while the rest of the Fraser bottomland and the lower portions of the valley walls are in the Coastal Mountain Hemlock Ecosystem. The middle elevation valley walls are in the Coastal Mountain Hemlock Ecosystem and the areas above the tree line are in the Coastal Alpine Ecosystem (Demorchi, Lea, and Button 2000).

The Stó:lō traditionally utilized all of the many habitats found within these ecosystems including rivers, lakes, marshes, bogs, floodplains, and alpine meadows. Since colonial times, Stó:lō land has been reduced enormously. The non-treaty establishment of reserves represented a huge loss of land, which Joseph Trutch, Chief Commissioner of Land and Works further reduced in 1867 by 92% (Carson 2001, p94). This massive seizure of land, epidemics of smallpocks, influenza, and tuberculosis, and other forces of assimilation have severely restricted access to traditional resources and the traditional knowledge necessary to utilize those resources. Despite a grim colonial history, the Stó:lō continue traditional practices such as fishing, hunting, and berry picking.

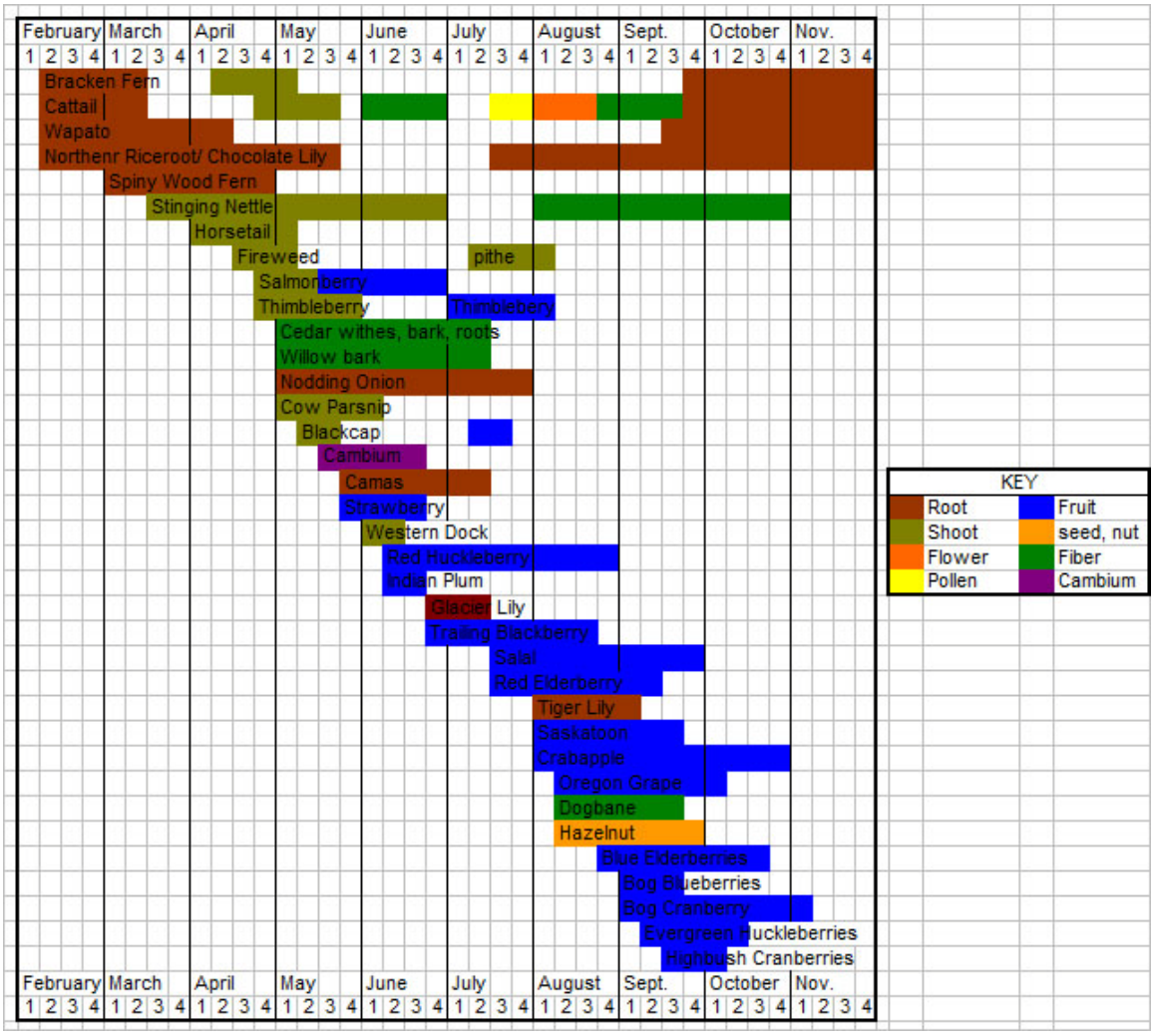
Seasonal round, access to food and some thoughts on risk management.

The Stó:lō are intimately connected to their territory. This connection is multi faceted and complex. On the most basic level, the land provided a diverse diet and pharmacopeia, clean water, and materials for clothing and shelter. The Stó:lō organized themselves to meet their biological and cultural needs and to compete for natural resource derived wealth.

[2] K^{w}ak^{w}aka'wak^{w} Clan Chief K^{w}axsistalla (Adam Dick) explained to the author the meaning of Gwayee (the Kwak'wala name for the Kingcome River) as "the largest river north of the Fraser River." The K^{w}ak'wala name for the Fraser River, he said, means "the biggest of them all (Adam Dick personal interview, 2008)."

Natural resources were abundant in the Stó:lō territory, but they were not available in all places or at all times. How could Stó:lō take advantage of both productive salmon fishing ground in the Fraser Canyon and wapato sloughs 100 km downstream around Katzie? They could either travel or trade. While there is evidence that the Stó:lō did both, the prevalent practice of moving seasonally to harvest their own resources indicates that travel was preferred to trade. These seasonal rounds were coordinated with important food and fibre resources. Table 1 below provides information on the seasonal availability of important plant resources in the Stó:lō territory. See Plate 21 in the Stó:lō Atlas (Carlson 2001) for the seasonal availability of fish, and game resources.

Table 1. Seasonal availability of important plant foods and fibres.[3]



In a hypothetical Stó:lō year, spring started first in the Fraser lowlands. The thawing of frozen ground and river ice made the edible bracken fern, spiny wood

[3] Table 1 is based on the author's observations and experiences harvesting plants over the last 12 years.

fern and cattail rhizomes, wapato tubers and riceroot bulbs available. Later in the spring the edible shoots of stinging nettle, salmonberry, thimbleberry, fireweed, bracken fern and cow parsnip emerge. In the spring a kind of time travel was possible: gaining elevation was like traveling back in time as the shoots were phonologically less advanced the higher they went. Duck, goose, and robin eggs provided early sources of fresh protein. In April, Chinook salmon and eulachon arrived in the Fraser and people left their depleted larders' to set up fishing camps. The season for vegetable shoots ended when the first salmonberries started to ripen in the beginning of June. Warm weather encouraged sap flows, which facilitated the easy harvest of cedar bark, roots, and withes. These materials were carefully bundled and put away for winter weaving projects. The edible roots from early spring were no longer available fresh, but for those lucky enough to have a camas meadow or trade connections in the Gulf Islands, camas bulbs were ready to harvest. The Indian plums peaked on the solstice and early July brought the first thimbleberries. The long dry days of midsummer were perfect for traveling and week long excursions to the recently snow free alpine to harvest, cook, and preserve glacier lily bulbs was in order. The heat began making the mountain goats uncomfortable and they scratched their winter coats off onto bushes where the fur was easily collected and stored till winter when it was woven into blankets. Back down in the valley bottom the sockeye started to run. Fish weirs were constructed along the Chilliwack and other shallow tributaries and dip nets were mended for use in the Fraser Canyon. The first Fraser sockeye, bound for distant headwaters, had large fat reserves to sustain them on their journey. They were too fat to wind dry, and were instead rendered for oil[4]. The next run of sockeye was lean enough to be wind dried, which was done before the large late summer fly populations could infest the meat with maggots. Late July and all of August was spent on multi day expeditions to harvest and preserve the service berries, salal, and red huckleberries in the lowlands and mountain huckleberries[5] and low bush blueberries in the mountains. Marmots or "whistlers" and deer were also hunted during trips to the alpine and after the picking was finished, the berry patches were carefully burned. Back down in the lowlands fishing continued and lower in the valley, the fish were smoked till they were bone dry. In September the wapato leaves begin to die back marking the beginning of the wapato season[6]. Women waded into the waste deep water and used their toes to loosen the edible tubers. Crabapples, bog cranberries and highbush cranberries were picked throughout late September and early October, as were stinging nettle, whose stalks were harvested and dried so that they could be made into twine during the winter. Snow falling in the mountains drove the deer and mountain goats to lower elevations where they were more easily hunted. Ducks and geese were also hunted as they rested in sloughs and lakes on their southern migration.

[4] For a detailed description of this process, see transcripts from my interview with Ralph George, May 21, 2009.
[5] ibid
[6] ibid

By December the larder was again full with enough dried roots, berries, meat, and oil for another winter. (Hanson 1973 as referenced by Thom 1995)

Over the course of this idealized year, I estimate that the Stó:lō ate a minimum of 5 species of starchy root, 5 species of vegetable shoots, 10 species of fruit, 8 species of fish, 8 species of game, and 5 species of bird (and bird eggs). They also used countless medicinal plants, a variety of fibre and dye plants. Trade with coastal and interior First Peoples would have increased this list considerably. Stó:lō Traditional Use Surveys conducted between 1996 and 1998 with 126 individuals identified 142 useful plants, 27 fish, 33 mammals and 54 birds (TUS Final Report, 1998).

Such an incredibly diverse diet required extensive mobility and coordination because some foods were concurrently available from distant locations. Dugout cedar canoes made rapid travel possible. The Stó:lō divided their labor force by specializing in particular roles. The men generally hunted, fished, and built large permanent structures, and the women gathered, processed food, and made baskets, twine, and clothing. Young children of both sexes generally helped their mothers. (Carlson 2001, plates 20-22)

The fundamental unit of traditional Stó:lō society was the family (Schaepe 2006). Extended families lived together and followed food resources seasonally throughout their territory (Carson 2001). High status families carefully arranged marriages (Hill-Tout 1904, p 318) that, I argue would provide them access to productive or novel resources such as marsh wapato beds, alpine berry picking grounds, or riverside fishing grounds. Marriages outside of Stó:lō territory would have similarly facilitated access to resources such as Lummi clam digging beaches, or Thompson balsam root grounds. Access to particular resources was so infused into traditional Stó:lō culture that person's name carried implicit territorial rights (McHalsie, personal communication 2009).

I suggest that marriage patterns and community organization strategies were also means of managing risk. Not all wealth was accumulated by scrupulous means as the Stó:lō traditionally kept slaves (Suttles 1958) . High class families utilized slaves to more rapidly convert natural resources into wealth. I argue powerful families guarded themselves against being taken as slaves by marrying into the other families powerful enough to organize slave raids.

A family couldn't be related to everyone, and distant nations were still feared. The Fort Langley Journals include many accounts of coastal raiders from the Comox and Nanaimo areas taking Stó:lō slaves. I argue that risk was greatest in resources sites that had concentrated productivity and were closest to rivers where coastal war canoes could easily travel. In these areas, families aggregated into villages as a means of mobilizing a collective defense (Schaepe in Carlson 2001, Plate 12).

Diffuse and relatively inaccessible resource sites, such as alpine berry picking patches, were at little risk from raiders. Though berries are picked during the late summer "raiding season" the high mountainous terrain where the berries were found was too far from the navigable waterways of the coastal war canoes. I believe that is why alpine berry harvest camps were only made up of few families.

Wapato, on the other extreme, was a resource with acute distribution on only a few dozen lakes and sloughs which were easily accessed by coastal war canoes. The family homes near wapato marshes were aggregated into village clusters. For example, archeological excavations at a wapato site near Musquem showed that homes were arranged touching each other in long rows (Schaepe in Carson 2002, Plate 12). Schaepe argued that this was indeed a defensive strategy.

The Fraser Canyon fishing grounds provides an intermediary example and unlike wapato, fish were harvested during the peak of the raiding season. Fishing and wind drying sites were spread out linearly along the river. However the family dwellings did not follow this pattern and were instead concentrated in or near heavily defended areas such as Lexwts'o:kw'em where Schaepe argues a series of rock walls and possibly palisades provided protection from coastal raiders (Schaepe 2006).

Managing productivity

While seasonal movement and labor division allowed the Stó:lō to maximize their use of resources that grew naturally, they also intensively managed key fish, root, and berry resource for increased productivity and sustainability. For example fish weir construction allowed Stó:lō fishers to assess salmon stocks and allow an appropriate amount to pass upstream and spawn (Hill-Tout 1904 p. 313; Harris 2001); weeding and raking of wapato beds created plentiful stocks of large tubers; similarly, burning and pruning of alpine blueberry patches increased berry size and proliferation. Whether increasing the size and abundance of a root or berry, or insuring future yields of fish, management of these resources was well integrated into traditional knowledge and supported by cultural notions of ownership (Personal Interview with Ralph George May 21, 2009). I had a chance to discuss both wapato and berry management with Stó:lō elder Ralph George, and use this paper to expand on the traditional use and management of these foods

Wapato

Wapato (*Sagittaria latifolia*) is an aquatic emergent plant that is prized for the robin to goose egg sized edible tubers it produces. Wapato was historically found in tidally influenced lakes such as Lake Sumas and Pitt Lake and slow moving fresh water sloughs and side channels of the lower Fraser River (Spurgeon 1996, 2001, 2002; Garabaldi 2003). Wapato was also used extensively by the Chinookan People on the Lower Columbia (Darby 2005).

Wapato was an important form of starch in the Stó:lō diet; It's tubers are efficient to harvest, store well, cook quickly, and have a pleasant flavor. Wapato was such an important resource that collection sites were usually owned (George personal interview May 21, 2009; Suttles 1955). Anthropologist Wayne Suttles documented six family or tribe owned wapato beds with special place names in the Katzie territory (Suttles 1955). Wapato was dug in the fall after the vegetation began to die back (George, personal interview May 21, 2009). Women harvested the tubers from canoes with digging sticks or by treading along the slough bottom to loosen the soil with their feet (Suttles 1955). The tubers are less dense than water and float to the surface when the soil is agitated and rootstalk broken.

Even though extensive work has been done on wapato by Terrence Spurgeon and Anne Garabaldi in the Fraser River, Stó:lō Elder Ralph George gave such excellent description of how to harvest and process wapato tubers, I had to reproduce every detail of it. During our May 21, 2009 interview he said the harvest began

> "… in August [or] September... 'cause that is when the stalks start dieing off on the wapato. Yeah, the top stalks are dieing off. That's when you get them—get them before they go completely dormant. We'd go right in the water and pick them right out from underneath there. Sometimes we would have to use a long rake to rake them from the bottom.

In a year he said his family would harvest over 400 pounds of wapato. "[We] would be probably [harvest] about 8-9 sacks…And that would last through the winter." He estimated that a sack held 50 lbs of wapato.

To process them, He said you must first

> "…peal it, or scrape the outer part of the roots with a knife so you don't get any slime into the roots. Cause if you got that slimy stuff in there then it will make you sick because that slime on that wapato is really strong. Yeah, its really strong, if you got some of that in your roots then you would get more sick then it would help you. Because that slime is just pure—just like poison. That's why we used to have to scrape it all off with a knife, and make sure you got all of that outer bark off. It's just really thin."

Once the tubers are peeled George said they

> …would cut them into strips, like narrow strips so they are not real thick. Because if they are real thick then the center, it would go bad. It would rot if it wasn't split thin enough. The center part would go bad right away. Then his family would "dry them right over the stove. And sometimes we would dry them in our smokehouses. It all depends on if we had fish smoking, then we'd hang them up in the smoke house and dry them in there."

George said they often cooked wapato with other wild vegetables and served it with wild game.

George was keenly aware of the soil conditions of the wapato patch. He said

> …the slough bottom is really soft. It is really gooey underneath…some places about 4 inches [deep]. But we had to keep it that way for the wapato. Cause if it was solid ground then the roots wouldn't take to the ground. If is soft like that then the roots spread out and go into that mud and silt…easier than trying to go into solid ground, like rocky ground.

George said managing the wapato was part of a yearly routine.

> …Every spring we would go in there and then we'd rake the bottom. You know, we'd rake the bottom so we'd get all the other vegetation that was trying to grow in there. We'd get all that out and let the wapato come up by itself. Cause the wapato has its own seed in the mud. After we pick it and after it goes dormant it has its own seed. It's underneath the mud about this deep [20 cm] and the top vegetation grows on top of them. Then we have to go and rake all that top vegetation from it—from interfering with wapato, from growing up. That's how we used to help them wapato a long time ago.

George would rake out all the dormant plants on the bottom of the wapato patch. Since wapato grows every year from *underground* "seed" tubers, all the detritus and vegetation *above* the slough bottom hinders wapato growth. Wayne Suttles records a similar practice among the Katzie. He writes, "…families might establish claims for the season by clearing tracts, several hundred feet long, of other growth so that the roots could be gathered more easily. (1955, p. 27) This description is helpful but unfortunately nebulous. Was Suttles trying to convey that the other plants were only removed to increase the ease of access to the tubers? From my own wapato harvesting experiences, I can attest to the difficulty of treading on slough substrate littered with woody debris and bound with cattails. Might, Suttles's description also suggest that the practice of clearing a wapato patch made the tubers larger and/or more plentiful and therefore easier to collect?

George's description corroborates the latter. His careful management was aimed at producing healthier wapato plants that in turn were capable of producing large tubers. George noted that today wapato tubers are much smaller than they used to be. He said "…now they are not very big, they are about this size now [making a smaller circle 2.5 cm in diameter with hands]. They are not very big ones now." He said they used to be 7-10 cm in diameter. Based on this evidence, we may reasonably conclude that Stó:lō wapato management facilitated "easy" harvest by not only removing objects in the way of the harvester, but also optimized wapato growing conditions enabling them to attain larger size and abundance.

Blueberry management

Subalpine and alpine berries (*Vaccinium ssp*.) were also intensively managed by the Stó:lō . Black huckleberry (*Vaccinium membranaceum*), oval-leaved blueberry (*Vaccinium ovalifolium*) blue-leaved huckleberry (*Vaccinium deliciosum*), and Alaska blueberry (*Vaccinium alaskense*) were fertilized, burned, and pruned to increase the size and abundance of berries and eliminate competing vegetation. See "Documented Precontact Plant Management on the Northwest Coast" published in Keeping it Living for excellent discussion of *Vaccinium* management (Lepofsky et al 2005).

Vaccinium species (hereafter referred to collectively as blueberries) are among the most widely recognized wild foods. Among the Stó:lō traditional use survey's I reviewed, they are mentioned more than any other traditional resource except salmon (which is also a conglomeration of several species). Blueberries were picked in the late summer when families would travel into the mountains for several days at a time. Ralph George says his berry picking camp included six families. He said "It was all of our relations, our cousins and different relations like that. Our in-laws from different families that was married into the family. They came and everybody had a special chore to do in that area."

Some people would be picking berries, others would be preparing food for the pickers, someone might be hunting, and others would be spreading the berries out on canvas sheets to dry. George says the canvas was "about 10' x 12'. It wasn't a very big one. But there was, must have been about 10 of them canvases laid out…in our tent camp." He said the canvas was placed on

> …mossy ground if there was moss. If there wasn't anything there then we would get some fir branches or cedar branches and put them down before we laid the canvas down there so that the air [would circulate] underneath the canvas. Yeah, cause if you don't have the air circulating underneath the canvas then that moisture from the ground gets up through the canvas and it will get at the berries. So that's why we had to spread out those fir bows or cedar bows to keep it from touching the ground so it won't draw the moisture out from the ground into the canvas.

George said, "it takes about 3 days," for the berries to dry.

> It all depends on the sun. If you got a good sunny day it will just take 3 days to dry. Yeah, we would leave them out in the sun during the day and then we would go there and flip it up and all the dried leaves would blow away in the wind. Yeah, cause sometimes you would get leaves mixed with the berries and then you just flip it up in the air and the wind would come and take them leaves out from flipping them berries up in the air….

In the evenings, George said they would

> …roll them all up right in the canvas. You'd roll it…and go and store it in the tent so that the dew won't get at it. And as soon as it gets sunny, when it warms up in the morning, then we would go take that roll and unroll it back out.

Sometimes they brought canning equipment up into the mountains to make jelly or can whole berries. George said if they made jelly they would "squeeze the juice out of that into a great big pot, then we can the juice for making jelly out of the juices." The remaining pulp would then be put on the canvas to dry. Whole berries were also canned with only the addition of "A little bit of sugar and it all depends on if there is good juice in it and if it is not quite as strong as you want it, we'd add just a few teaspoons of vinegar to the juices to make it a little bit more tangier…" George said his berry camp would can as many as "100 dozen jars…Yeah, between 6 families. That's for the whole community; it's not just for our own use."

After the berries were processed the management began. George said that "When we get finished picking them up in the mountains there, we cultivate them and then prune them all out before we come home..." He elaborated saying,

> Like if the bushes get too clumped up in one area, we have to take everything out around that bush in order to make it grow good—good berries. Cause if it's cluttered up with a whole bunch of other bushes behind, it eats up the vegetation and goes into the berries. So we have to take everything out that is around there that is within 5-6 feet of that bush. And keep that cultivated up like that so when you go back and pick the blueberries then they are good and big. That is why we thin them out, you know, take out the old stalks, and prune them back quite a bit so that all that vegetation that do grow up into the vines it gets good vegetation and clear vegetation for them blueberries to grow big, nice and juicy.
>
> Then the next spring we go up and see if they are okay and check them over and see if there are some stalks that has to be pruned back a little bit more and we prune them back if they have to be pruned back so that the berries can grow a lot bigger during the summer.

The lower elevation berries were sometimes burned. George said,

> "Up in Yale there we used to burn some of the blueberries out every—about every 10 years they would go and burn the blueberries bushes out—completely. After we get them all burned out then we go back and check all the blueberry bushes that survived the fire, then we cut them back and cultivate the ground underneath them to aerate the roots and everything. Then we bring water in there and spread water on them bushes. They would water them so that they would start growing back a lot better… And then sometimes we used to bring our cow's manure up in the mountains to

> fertilize them bushes, and some chicken manure too. Yeah, it all depends on the mountain slope. If it's too sunny then we wouldn't get very good fertilizer in the roots and we would bring some of the fertilizer from our stocks up there. Yeah, we would pack it up. But it was all dried out fertilizer. But when we got it up on the mountain we mixed it with water to put in the ground.

Fertilizing with cow or chicken manure may not sound like a traditional practice, but it may have been consistent with pre European contact methods of fertilizing. Later in the interview when we were talking about "wild potatoes" I asked Ralph what the old people would have used for fertilizer before cows were around. He said "they would use fish, fish guts and backbone and all that. They make manure out of that."

Management

George's description of managing blueberry patches with fire, pruning, and even fertilizing are not anomalous on the NW coast. For example, A Yakama elder recounted her traditional knowledge about fire saying "God told people to burn the forests and the huckleberries would grow (Fisher 1997; p. 8)." The Minor Native Americans from around Mt. Adams, WA believed that it was important to burn alpine meadows to keep trees from encroaching (ibid). This is supported empirically by Douglas (1971) who found that fire eliminated groundcover species that compete with *Vaccinium deliciosum*. Vander Kloet (1994) found that *Vaccinium myrtilloides* berry production was the greatest on the third year of a prune-burning cycle. Stó:lō elders Helen and Ivan Angus (1996) Amelia Douglas (1997) and Annie York (1984), also recount the importance of fires for berry production. Helen and Ivan Angus reflected that managing berry patches was "just like looking after a garden (1996.)" They also recounted burning bushes in the fall after the berries were picked, saying, "You burn the place off, 3 or 4 years [later] you get blueberries (1996)." Reports of traditional berry fertilizing are more difficult to find but Turner and Peacock (2005, p. 118) provide a summary of documented examples including seaweed used to fertilize camas and potato patches, the waste from rendering eulachon grease to fertilize stinging nettle (*Urtica dioica*) patches, and most relevantly, an account by Heiltsuk cultural specialists Cyril Carpenter and Pauline Waterfall of the remains from butchered fish and game being used to fertilize blueberries and huckleberries.

Ownership

According to Ralph George, a family would return to the same blueberry patches every year. This makes sense given the labor invested in maintaining the patches. He says, "We had our own areas to go to, like all the different people in the valley here, they had certain areas that they went and picked and went and hunted. Everybody respected everybody's areas that was up in the mountains." George described who had access to blueberry meadows saying, "It was all of

our relations, our cousins and different relations like that. Our in-laws from different families that was married into the family." Established cultural conceptions of ownership protected the labor invested in cultivating the berry fields from being taken advantage of by someone outside of the family.

Logging in the Stó:lō territory has disrupted traditional patterns of berry management. In 1997, Stó:lō Elder, Helen Angus complained of logging destroying traditional trails into the mountains. However, she says that logging is good for the berries and says that burning is no longer necessary (Kevin Washbrook TUS field notes 1997). By destroying access to traditional sites and providing easy access to clear cuts with good berry production, logging has significantly changed Stó:lō berry use. Easy access to berry patches makes day trips possible, which in turn makes sun drying the berries impractical. Furthermore, foreign management and restricted access to traditional sites has disrupted patterns of ownership. Despite these transformations, harvesting blueberries continues to be a favorite pastime of Stó:lō elders.

In this section, I provided detailed accounts of how wapato, an important starchy root resource, and alpine blueberries, the most important berry resource, were harvested, and managed. I also provided evidence for ownership of these resources and argue that ownership was a social mechanism for protecting the labor invested in the management of these resources.

The Ethnobotany Garden

The ethnohistory garden was established in 1996 to as a teaching tool for Stó:lō ethnobotany (Prevost and Dwyer 2002). Isadore Charters, a Stó:lō elder that uses the garden to teach school groups from Chilliwack area, explained to me that the plants in the garden represent the Stó:lō territory from Hope all the way down the River (Charters, personal interview May 14, 2009). Signage at the entrance to the garden delineates many of the different Fraser valley habitats that are represented in the ethnobotany garden.

I had several opportunities to walk through the garden, including an individually guided session with Charters. It has matured considerably in the 13 years since it was constructed. The trees are large enough to provide shade, the bushes fully mature, and wetland well established. Since the construction of the educational sign at the entrance to the garden, I observed several new useful species have been added to the garden (See table 1 below).

Table 1. Plants found in the Stó:lō Ethnobotany Garden by use category.

Common Name	Root Veg.	Shoot Veg.	Leaf Veg.	Flower Veg.	Bark Veg.	Fruit	Fibre	Wood	Dye	Medicine	Tea	Ceremonial	Com. harvest
Red Alder					?			x	x				
Mountain Ash						?				x			
Birch								x					
Blackberry						x							
Blackcap		x				x							
Bulrush							x						
Camas	x												
Cascara										x			x
Cattail	x	x		x		x	x						
Western Red Cedar							x	x				x	
Yellow Cedar													
Bitter Cherry							x						
Cottonwood					?			x		x			x
Devil's Club										x	X		
Douglas Fir								x					
Gooseberry						x							
Hazelnut						x		x					
Red Huckleberry						x							
Labrador Tea											X		
Licorice Fern											X		
Broadleaf Maple								x					
Sphagnum Moss													
Mushroom		x											
Short Oregon Grape						x			x	x			x
Salmonberry		x				x							
Saskatoon Berry						x		x					
Stinging Nettle		x	x	x			x			x	X		
Tiger Lily	x												
IN GARDEN BUT NOT ON SIGN													
Red Osier Dogwood										x			
Black Twinberry										x			
Oceanspray								x					
Ninebark								x					
Horsetail		x											
Red Elderberry						x		x		x			
Indian Plum						x							
Willow							x	x		x			
Evergreen Huckleberry						x							
Black Hawthorne						x		x		x			
Strawberry						x					X		
Total # of species (out of 40)	3	6	1	2	0	14	5	13	2	11	5	1	

Short History of the Garden

The garden was created as part of a the larger Shxwt'a:sehawtxw ("The house of long ago and today") project which was a vision of Gwen Point's. Point, who at the time was the Education Manager in the Community Development Education Depart of the Stó:lō Nation, felt the need to provide the increasingly urbanized Stó:lō youth with educational opportunities steeped in traditional knowledge. This vision was manifested the construction of a longhouse, a museum with Stó:lō art and crafts, and the ethnobotany garden. (Prevost and Dwyer 2002)

J. Reeve Consultants Ltd. Out of Vancouver was then hired to develop a landscape plan. She produced a plan, that is now posted by the Stó:lō gift shop, but according to Theresa Carlson, who worked for the Stó:lō Nation at the time, nobody knew how she came up with the plants she included on the list. Carlson said Joana Clark, a private contractor from Vancouver was really the person that was instrumental in building the garden. Clark worked with elders to develop a species list and managed the construction of the garden (Carlson, phone conversation with the author May 2009). The garden opened in 1996 and has been in operation ever since.

The Stó:lō garden is the most mature ethnobotany garden I have seen. That said, I was surprised by the exclusion of several food plants that at one time were enormously important to the Stó:lō, namely wapato (*Sagittaria latifolia*) and glacier lily (*Erythronium grandiflorum*). I was curious to know why they were not included and explored it further in this paper. My hypothesis was that if elders (in the 1990s) helped put together the species list, it would reflect plants that they used during their lifetime and the dearth of root foods would represent an early switch from native root foods to the introduced root foods, such as the potato (*Solanum tuberosum*).

Analysis of the plants represented in the Stó:lō Ethnobotany Garden

My first impression of the species composition was that fruit bearing species seem to be over emphasized and roots under emphasized in the ethnobotany garden. A simple quantitative analysis was performed to check this. Of the 40 species growing in the garden, 14 of them are fruit producing. By comparison, only three produce edible roots and 6 edible shoots. To understand how significant these numbers are, I had to compare them with the total number of species within each of these categories. I used Nancy Turner's book Food Plants of Coastal First Peoples (1995) to populate a list of the plants known to occur in the Stó:lō territory that weren't already in the ethnobotany garden (Table 2).

Nine additional berry species were identified which means that 14 of the 25 berries (56 percent) that were used by the Stó:lō are represented in the ethnobotany garden. Shoots are represented equally to berries with eight of the 14 edible shoots (57 percent) found in the garden. However, roots are

surprisingly poorly represented with only three of the 12 possible edible roots (25 percent) planted in the garden. Leafy vegetables were also poorly represented with only one of four species (25 percent) in the garden.

Incomplete information made it impossible to complete a similar analysis for the other use categories (e.g. fibre, dye, etc.)

Table 2. Plants recommended for the Stó:lō Ethnobotany Garden

Common Name	Root Veg.	Shoot Veg.	Leaf Veg.	Flower Veg.	Bark Veg.	Fruit	Fibre	Wood	Dye	Medicine	Tea	Ceremonial	Com. harvest
RECOMMENDED TO ADD TO GARDEN													
Glacier Lily	x												
Chocolate Lily	x												
Wood Fern	x												
Bracken Fern	x	x											
Wapato	x												
Nodding Onion	x	x	x	x									
Hookers Onion	x	x	x	x									
Cow Parsnip		x											
Thimbleberry		x				x							
Fireweed		x					x						
Blue Elderberry						x							
Highbush Cranberry						x							
Bunchberry						x							
Stonecrop			x										
Salal						x							
Labrador Tea											x		
Gooseberry						x							
Western Dock	x	x											
Silverweed	x												
Crabapple						x		x					
Blackcap		x				x							
Trailing blackberry						x					x		
Total # of species	9	8	3	2	0	9	1	1	0	0	2	0	0

Such analysis operated under the assumption that all species were valued equally. But was the mealy fruit of black hawthorn really as important as a sweet blueberry? To provide an analysis that took the ethnobotanical *value* into consideration, I turned to the traditional use surveys compiled by the Stó:lō Nation.

The traditional use surveys (TUS) were done between October 1996 and February 1997. During this time, 187 interviews were done with 126 elders. The objective was to determine what resources were/are traditionally used by the Stó:lō and where those resource were used (Washbrook et al 1998). I reviewed

a subsample[7] of 25 interviews conducted with 30 elders. Interviews were coded by use category and species used.

My assumption was that highly valued plants would come up the most frequently in the interviews. By that logic, the most important plant was blueberry which was mentioned in 48% of the interviews I sampled. Following blueberry in decreasing order of importance were blackberry (32%), cascara bark (24%), mountain huckleberry (20%), red huckleberry (20%), saskatoon berries (20%), salmonberry (20%), cedar roots and bark for weaving (20%), swamp tea(16%), strawberry (16%), plantain leaf medicine (12%) and thimbleberry shoot (12%). Table 3 below shows the species found in the ethnobotanical garden and the frequency (percent of the time) they are mentioned in the TUS, which serves as an approximation of their value.

[7] While I did not randomize my sample, the interviews were selected without bias since I reviewed them alphabetically. I argue they reflect an unbiased subsample of the biased sample of elders that the Traditional Use Survey Team chose to interview.

Table 3. Approximated value of plants by use category for species represented in the Ethnobotanical Garden.

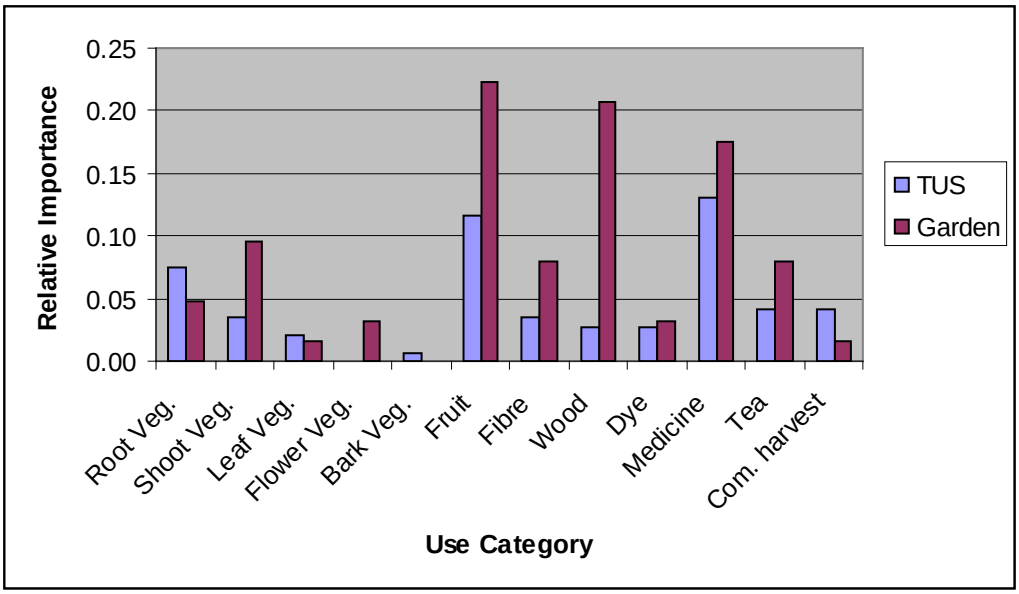
Common Name	Root Veg.	Shoot Veg.	Leaf Veg.	Flower Veg.	Bark Veg.	Fruit	Fibre	Wood	Dye	Medicine	Tea	Ceremonial	Com. harvest
Red Alder					0			12	4	4		4	
Mountain Ash						0				0			
Birch								4					
Blackberry						32							
Blackcap		0				12							
Bulrush							0						
Camas	4												
Cascara										4			20
Cattail	0	0		0		0	8						
Western Red Cedar							20	0				0	
Yellow Cedar													
Bitter Cherry								4					
Cottonwood					0			0	4	0			12
Devil's Club										8	0		
Douglas Fir								0					
Gooseberry						0							
Hazelnut						4		0					
Red Huckleberry						20							
Labrador Tea											16		
Licorice Fern											0		
Broadleaf Maple								0					
Sphagnum Moss													
Mushroom		8											
Short Oregon Grape						0			4	8			8
Salmonberry		8				20							
Saskatoon Berry						20		0					
Stinging Nettle		0	8	0			0			8	4		
Tiger Lily	4												
IN GARDEN BUT NOT ON SIGN													
Red Osier Dogwood										0			
Black Twinberry										0			
Ocean Spray								0					
Ninebark								0					
Horsetail		4											
Red Elderberry						0		0		8			
Indian Plum						0							
Willow								0		0			
Evergreen Huckleberry						0							
Black Hawthorne						0		0		0			
Strawberry						16					0		
NOT IN GARDEN BUT IN TUS													
Blueberry						48							
Blackberry						32							
Mountain Huckleberry						20							

Red Huckleberry						20							
Swamp Tea						16							
Plantain						16							

The most surprising discovery of this exercise was that of the dozen highest valued plants, five are not included in the ethnobotany garden, including blueberry, the highest valued plant in the traditional use surveys! The other plants are mountain huckleberry, red huckleberry, swamp tea, and plantain. However, growing swamp tea in the ethnobotany garden may not be possible due to its restricted habitat requirements.

Plants mentioned in the traditional use surveys and represented in the ethnobotany garden can also be compared by use category. For this exercise I counted the number of species within each use category and divided the sum by the total number to determine what percent of the total number of species each category represents. This told me if the number of species from each use category of the ethnobotany garden are a proportionate sample of the same use categories in the TUS data. In other words, does the ethnobotany garden emphasize the right use categories?

Figure 1. Proportion of ethnobotanical species in each use category.



The “wood” use category (Figure 1) shows a huge disparity indicating that the ethnobotany garden represented proportionally far too many wood species. However, we can easily explain this because plants that can be used for wood may be primarily valued for other things such as cedar, which is primarily valued for its bark (a fibre). Berries are also disproportionately represented in the ethnobotany garden. They other categories are reasonably proportional.

Conclusions and recommendations

My analysis supports my initial observation that berries were over emphasized but contradicts my observation that roots were under emphasized. In fact, relative to the traditional knowledge at the time that the garden was created, the creators of the garden represented roots proportionately. However, if the Stó:lō want to reflect the plants that were historically used, and not just the ones that are commonly remembered by their living elders, then they would do well to include more edible roots and shoot species such as bracken fern, wapato, glacier lily, thimbleberry, and cow parsnip. Berries are already over-represented in the ethonobotany garden but I recommend planting blueberries since they appear to be the most valuable berry species to the Stó:lō .

Mystery plants and notable accounts.

The interviews that I conducted were extremely informative and full of surprises. The following are two mysterious plant accounts by Ralph George (personal interview May 21, 2009) and my attempt to make sense of them.

Fraser River "Wild Rice"

While interviewing Ralph George he brought up a plant he called "wild rice" which immediately caught my attention, because to my knowledge, there are no accounts of grain use by Aboriginal People on the NW coast. Ralph described the plant as being "…long, just like a long oats. They grew about three feet tall… Then they used to hang over the banks of the river." Ralph provided vivid details of the harvest,

> "We used to pick quite a bit…in September…there was…a lot of rice plants along the river. They were just thick. We would put a big canvas in our canoe...go underneath the wild rice plant and we would hit the bushes with our paddle and all the rice would fall off into that canvas. Then we would take the rice home and dry it out…we used to dry ours in the oven…on a flat rack…for about 5 minutes and take it out and you'd have to rub them together like this [rubbing the palms of his hands together] to get all the stuff off of the rice…Then we'd put it in a gunny sack and then we would put them into big barrels, red 45 gallon barrels…to keep them in the winter time…cause it was nice and dry in them barrels…between two families we had about 10 barrels. But it wasn't all our use, it was for everybody that didn't get any, like the elders, we used to have to go around and see if the elders needed some, or some single families need some, you know. Somebody that was in need of food, we would go around and donate food to them. That's how we survived a long time ago, we looked after each other. [The wild rice] used to grow out in the river here. But there is no more now. All of the stuff that comes down the river has killed them all."

Ralph George is clearly describing a grain. Though the common name "wild rice" is also used to describe *Fritillaria camschatcensis* his description does not match it in any detail (*F. camschatcensis* is an important food plant, but only the bulbs can be eaten). Throughout North America, the name "wild rice" is most commonly used for the plant *Zizania aquatica*. *Z. aquatica* is a staple food for the Great Lakes Ojibwa where it grows abundantly in shallow lakes and slow moving streams (Vennum 1988). Ralph George's description of wild rice habitat (along the stream bank), distribution (thick), and plant height (three feet tall) are plausible for *Z. aquatica*. However, no *Zizania* species are recognized as a native component of British Columbia's flora.

Herbarium collections do provide some enticing clues. The University of British Columbia herbarium contains four collections of *Z. aquatica* from British Columbia, 3 of these from the lower Fraser Valley. The most recent collections was made by Jeff M. Saarela in September or 2004. Notation on the specimen indicates that it was collected "along edges of Widgeon Slough beside Siwash Island, near the confluence of Pitt River and Pitt Lake (Fox River Reach), north of Pitt Meadows." Recognizing the uniqueness of this collection, Saarela and wrote up the discovery and published it in the Botanical Electronic News.

> While fishing in 2004 in Widgeon Slough near Pitt Lake (north of Pitt Meadows) in southwestern British Columbia, we encountered a large and vigorous population of *Zizania aquatica* var*. aquatica*. The population had not been documented previously. Without doing a formal survey, we estimate that several hundred plants were growing in the shallow water on either side of the creek. Widgeon Slough is part of a larger area that has been used and inhabited historically by people of the Katzie First Nation, thus it is very likely that the species was at one time planted there and the grains harvested for consumption. Interestingly, band members of the Katzie First Nation were not aware of the population when contacted. We do not know how long the population has existed, or if it persisted beyond the 2004 growing season. Its discovery is noteworthy because it occurs close to Vancouver near the heavily-used Grant Narrows Regional Park, in the well- botanized Fraser River Valley. It is conceivable that the population has been overlooked by botanists in the past because it is accessible only by boat. Prior to this collection, Zizania had not been recorded in the province since 1987. (Saarela and Sears, 2006)

Ralph George's account is exactly the type of testimony Saarela was looking for when he talked to Mike Leon.

The other UBC *Zizania* collections date back to 1951 and 1948. The 1951 collection is by T. C. Brayshaw who left little in the way of notation besides describing the habitat as "shallow water" and the location, "Fraser-Valley Regional District: Hope, Kawkawa," which is nearby Ralph George's house in Shwohamil. The 1948 collection is by Ian Mctaggart-Cowen who picked Zizania from the shallow water at the head of the slow moving Meldrum creek near

Langley. Though the early date of this collection might at first suggest a wild population, Mctaggart-Cowen notes that it is "growing where introduced, in 8 inches mud over hard bottom. Second generation." Botanical references of *Zizania* on the west coast suggest it was planted for duck food (Hitchcock and Cronquist, 674)

A final historical clue is provided in the Thompson Ethnobotany where Annie York, a coauthor, said that "wild-rice was traded at Banff and Calgary from the Indians of the Rocky Mountains and Great Plains, especially the Cree. She herself used to pick it at Pitt Lake as a child (Turner et al 1990, p.144)," which would have been in the 1910s or 1920s, likely two decades before Mctaggart-Cowen's 1948 collection.

Who introduced this plant and why; If it was recently introduced, how did Ralph George's family know how to use it? Wild rice is a difficult plant to process. Ralph George's description of rubbing the plants between his hands to clean the chaff off of the plant could be accurate, but it would have been an exceedingly slow technique. I have personally tried to clean *Z. aquatica* that way and it took me about an hour to clean ¼ cup of grain[8]. The Great Lakes Ojibwa traditionally cleaned their rice by treading on it in a pit lined with leather while wearing leather moccasins; today they use machinery to hull their rice (Venuum 1988). If Ralph George was describing *Z. aquatica* I would expect more emphasis placed on the difficulty with which the grain was hulled. Another piece of evidence that challenges the conclusion that George's "wild rice" is *Z. aquatica* is his description of the grain size. He says "…it was small kernels, not like the kernels you get now days. Yeah, they were really small, small rice." The grains of *Z. aquatica* from herbarium specimens I examined[9] (which were not from the Fraser River valley, but from other locations in BC) were roughly 1.5 -2 times larger than domestic rice. I wrote Sareela and Sears to ask how big the grain was on their 2003 collections, but had received no reply by the time I wrote this paper. Follow up with George about the grain size and processing technique for wild rice could likely clarify these details. Given the evidence at hand, (1) George's "wild rice" description that mostly matches *Zizania aquatica* and doesn't match any other plants, (2) Annie York's corroborating account, and (3) the presence of *Z. aquatica* on the Fraser, I argue that George's wild rice is indeed *Zizania aquatica*.

We are still left with the difficult task of explaining George's and York's use of wild rice. There are no other known accounts of aboriginal *Z. aquatica* use, or any other grain, on the Northwest Coast. If this were a pre settler-Canadian

[8] Imagine how long it would take to lean the ~450 gallons of wild rice that George remembers harvesting annually.

[9] For example, the grain size of a 1959 collection of *Z. aquatica* by T. R. Ashley and housed at the University of Victoria Herbarium range from 1-1.5 cm long. This collection is from Pender Island.

practice and it was harvested in the quantities that George describes, then the absence of further ethnographic records of *Z. aquatica* use would be an inexcusable event. I provide two possible explanations. Firstly, perhaps wild rice may have been planted by settler-Canadian duck hunters and some Stó:lō families learned how to use it. Or, secondly, and more plausibly, wild rice was planted in the late 19th century or early 20th century by traveling or recently immigrated Aboriginal people from the Great Lakes "rice belt," who also taught a few families how to harvest and process the plant.

"Wild Potato"

In the same May 21, 2009 interview, Ralph George also discussed "wild potato." There are many plants commonly called wild potato by NW coast Aboriginal People including wapato (Sagittaria latifolia), glacier lily (Erythronium grandiflorum), tiger lily (Lilium columbianum), camas (Cammasia ssp.), and mt. potatoe (Claytonia lanceolata), so I immediately asked George to describe the plant he was talking about. He said the tubers were smaller than potatoes you buy in the stores today, the bushes were about a foot tall with "small skinny leaves" and pink flowers that flowered in July and August. He said the potatoes were harvested when the tops started to die.

> "… September is when they are completely died off, then that's when we would start picking. We used to watch for the top of the potato plant. As soon as the top of the potato plant dies off, then that's when we went in a picked the potato."

Smaller bulbs were carefully replanted to insure future harvests. George said, "we left some right in that whole for them to reproduce. Yeah, we didn't pick them all because we wanted some more for the next season." Replanted wasn't the only way he insured good productivity. The ground was also cultivated to loosen the soil and remove weeds and fertilizer added. George said "in the fall we would go there when they are still dormant and we'd mix chicken manure on top of the soil, and that will keep them dormant all winter long. Then when spring comes, just when it started warming up, like now, then we'd take cow manure and go out there with the juice of the manure and spread it around where the potatoes were growing, and that was our fertilizer—that was our fertilizer a long time ago was the manure from our cows and animals." Even before cows were around, George said the old people fertilized the potatoes. "…They would use fish, fish guts and backbone and all that. They make manure out of that."

George said he used to cultivate the wild potatoes near his home in Swahamel, but the old people used to grow them at their summer fish camp in the Fraser Canyon.

> We had quite a few bushes around the Res. here, and up through the canyon. When we were fishing up in the canyon there, they used to plant

> the wild potatoes up in the canyon, then they would have up there, during their fishing season. They would have their potato plants up there, that they picked when they were fishing up there. Yeah, same as the wild onions.

I concluded that George was indeed describing a potato *Solanum tuberosum*. The plant size, tuber producing nature, and habit of dieing off in the winter are all accurate for *Solanum tuberosum* and do not describe any other tuber producing plant in British Columbia. Potatoes were introduced very early on the NW coast during a relatively short period between first contact and European settlement (Suttles 1987). Anthropologist Wayne Suttles (1987, 2005) and ethnobotanists Nancy Turner and Doug Deur (2005) argue that the potato diffused so rapidly because the First Peoples on the Northwest coast were already adept at intensively managing and cultivating root foods. George's recollection that his parents harvested potatoes at their fish drying camp in the Fraser Canyon is testimony to the ability of the Stó:lō to incorporate potatoes into their seasonal round.

If George indeed described a potato (*Solanum tuberosum*) and they are known to have been cultivated by the Stó:lō , why include them as a mystery plant? The mystery is the flower color and the possible path by which the potato came to the Fraser. Most of the potatoes in North America were brought here by explorers from the Old World, which in turn came from South America in the 1500s.

When the Spanish explored the Pacific Northwest in the 1790s, they brought some potatoes with them directly from South America. These potatoes were a very different variety than those grown in the Old World. They planted these new potatoes at Neah Bay and again at Nootka Sound (Suttles 1987; Jane 1930 p. 96). These potatoes are called "Ozette Potatoes" due to the proximity of Neah Bay to Lake Ozette. Ozette Potatoes are different then common varieties on the market. They have smaller and more spindly tubers, a nutty flavor, and notably (at least in the pictures I could find of them) a pink flower. Wayne Suttles thought that all the potatoes planted by the Spanish on the NW coast died out and were not the variety that spread so quickly among the coastal Aboriginal People.

Suttles argues that the most likely source for those potatoes was the fur companies who planted them in Astoria in 1811, Fort Vancouver in 1825, Fort Colville in 1826, and Fort Langley in 1827. He also notes that many of the Hudson Bay Company men took aboriginal wives and could have taught them how to cultivate potatoes (Suttles 1987 p.145). Though Suttles's explanation is the most plausible, I speculate that The Hudson Bay Company would have supplied their posts with potatoes of Old World ancestry, which typically have white or purple flowers. Perhaps the pink flowered Ozette potato that Ralph George remembers is proof that the Stó:lō acquired their potatoes even earlier, from the first Spanish Explorers.

Final Conclusions and Recommendations

The Stó:lō have a lot of opportunities to further integrate ethnobotanical education, research and plant use into their programming. The ethnobotanical garden is well established and with the addition of a few more species and signage about how the species in the garden can be used, they could more successfully educate visitors. Signage could easily be developed from the plant accounts in Kevin Washbrook's "An Introduction to the Ethnobotany of the Stó:lō …(1995)."

The Stó:lō have access to a huge amount of unpublished ethnobotanical knowledge in the form of archived interviews. I recommend that the Stó:lō hire an ethnobiologist to go through the interviews and code them by use categories for both plant and animal species. An interesting analysis could be performed on how traditional knowledge is changing over time by comparing knowledge between different informant age cohorts.

More significantly, the Stó:lō could use the wealth of archived transcripts along with the notes and papers from the many scholars that have worked in the Stó:lō territory, to produce a comprehensive ethnobiology of the Stó:lō , much like The Living World (1998), which was published by the U'mista Cultural Society, for the K^{w}ak^{w}aka'wak^{w}. The three interviews I conducted showed me that there is still a huge about of detailed knowledge remaining with the elders. I recommend that the Stó:lō Nation continue to do interviews that focus on detailed descriptions of plant and animal use. Many scholars have already documented what species were used, where they were found, and what their Halkomelem names are, but there is still a lot to be learned about how the Stó:lō harvested, prepared, and managed their traditional resources. Revitalizing these traditions and educating the youth will be significantly easier using the words of their elders.

Lastly, the Stó:lō Nation has the opportunity to integrate traditional plant foods into the menu of the programs they conduct. Many of the plant foods the Stó:lō ate for thousands of years are easy to cultivate. They are adapted to the climate and don't need much watering or weeding, and are naturally pest resistant. Landscaping with these important food plants around the Stó:lō grounds (especially the elder's lodge) would require little costly maintenance, it be educational, and most important, it would be tasty. I developed a list of suitable species for landscaping (see Appendix 1). The Stó:lō could also initiate a horticultural program where these plants could be grown commercially and people could be educated on how to grow them.

Appendix 1. Recommended landscape plants for the Elders' Lodge

Common Name	*Scientific Name*	*Holkomelem Name**
Roots		
Common camas	*Camassia quamash*	***spáalxw***
Giant camas	*Camassia lechtlinii*	***spáalxw***
Tiger lily	*Lilium columbianum*	***sx̲àmeléxwthelh***
Chocolate lily	*Fritillaria lanceolata*	***stl'éleqw'***
Wapato	*Sagittaria latifolia*	***xwoqw'óls***
Glacier lily	*Erythronium grandiflorum*	***sk'ámeth***
Nodding Onion	*Allium cernuum*	***st'áxet***
Hooker's Onion	*Allium acuminatum*	***st'áxet***
Greens		
Stinging Nettle	*Urtica dioica*	***th'ə́x̲th'əx̲***
Cow Parsnip	*Heracleum lanatum*	***sóqw'***
Fruit		
Evergreen huckleberry	*Vaccinium ovatum*	
Salal	*Gaultheria shallon*	***t'áqa***
Red huckleberry	*Vaccinium parviflorum*	***sqá:la***
Oval leaved blueberry	*Vacciunium ovalifolium*	***xwíxwekw***
Blue elderberry	*Sambucus cerulea*	***th'í:kwekw***
Crab apple	*Malus fusca*	***qwe'óp***
Saskatoon	*Amelanchier alnifolia*	***ts'esláts***
Soapberry	*Sherpedia canadensis*	***sx̲wósem***
Strawberry	*Fragaria vesca*	***schí:ya***
Tea		
Trailing blackberry	*Rubus ursinus*	***sqw'ó:lmexw***
Licorice root	*Polypodium glcyrrhiza*	
Labrador Tea	*Ledum groenlandicum*	***móqwem***

*Upriver Halkomelem names from N. Turner field notes.

These species were selected based on their traditional use, good taste, and ease of management in a landscaping setting. Other plants, like salmonberry and thimbleberry, were traditionally very important, but may be difficult to manage.

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