The Relationship between Plants and People: An Ethnobotanical Study in Partnership with the Muckleshoot Tribe

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AUTHORIZATION TO SUBMIT THESIS

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ABSTRACT

The purpose of this study was to document the critical roles that have existed between Coast Salish people and the plants they have depended on since time immemorial. This study documented the past, present, and future uses of three specific plants: camas (*Camassia quamash L.*), chocolate lily (*Fritillaria camschatcensis L.*), and balsamroot (*Balsamorhiza deltoidea L.*). The primary goal of this research was to document the resilient retention of traditional plant uses in partnership with the Muckleshoot tribe and attempted to incorporate these plants into the diets and personal gardens of people currently living within the community. Although there has been significant loss due to colonization and ecological destruction many Coast Salish people continue to develop programs that preserve their traditional lifeways. Food can be a rare unifier. It can serve as a link to cultural identity and generations past. As many indigenous communities begin to heal by returning to traditional pathways the plant people offer key teachings to help them attain these goals.

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DEDICATION

This work is dedicated to my fiancé Nick Finley and my family. Without their love, support, and constant encouragement this project and many other aspects of my life would not be the same. I would also like to thank my Nana and my Mutter, Dorothy Matthes and Debbie Matthes, for instilling in me a love for plants and gardening at an early age and their patience while I “helped” weed and tend the plants in their gardens as a child. I will always be grateful for their wise words of advice and reassurance.

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"Those things that were in place before [colonization] heal us. Cultural practices are most important because this is our story… Things that help us are the things that we already had" (Krohn 2007:4) – Tom Ball in his speech on historic trauma at the Nisqually Healing our Wounded Spirits Conference in 2006.

Cultural Grounding

"Fly"

A Southern Lushootseed Epic

Told by Annie Daniels and by Peter Heck

Retold by Jay Miller

(Thompson and Egesdal, 2008:78-82)

In the early days of the world, Flytown hosted a gathering. Many people came. A man heard about it and decided to go. He floated on the river and paddled with his hand. Along the way, he met the Changer, who told him to carve paddles and a canoe out of cedar. But when the man picked up a piece of wood, it fought back. So the Changer used his mind to deaden the wood so people could use it. That was how woodworking began. At Flytown, the man worked in the woods, hollowing out his canoe during the day and attending the gathering during the evening.

Another person who came for the gathering was a girl who had just had a baby. She and the baby were supposed to stay secluded for several days, but she came to Flytown instead. She hid the baby in the brush near the town and went off to watch the dancing through the cracks in the plank walls of the houses. In time she forgot about her baby, who would wake up and cry until it fell asleep again.

The man working on the canoe heard the baby crying off and on for several days. Finally he looked for and found the baby. He went home and told his wife, who pretended to be pregnant for a day. The man built a birthing hut for her, brought the baby there, and the woman pretended to have the baby. In five days he grew into a boy, and his father made a bow and arrows for him.

The couple already had an older girl, who resented her new brother. While he was trying out his new bow, she teased him. "Bet you can't hit me! You never could hit me!" The boy ignored her for as long as he could. After five times, however, he shot at her hand and hit it. The girl screamed, again and again, "I was shot by the

discard claimed by my parents." When their mother heard this, she said, "My daughter is all mouth," and ran into the woods to calm the situation.

But the boy ran far away, flung himself onto the ground, and cried his eyes out. The searchers never found him. After a long time, the boy got up and went on.

Eventually he met Cougar Woman, who decided to raise the boy until she could marry him. She tried to feed him some of her big red berries, but the boy knew that these were lizards. Instead, Crane Woman, who lived with Cougar, went out and got salmon fry for the boy to eat. He liked those.

After a time, Cougar got possessive of the boy and he decided to run away. Crane helped him by saying that Cougar could only be safely shot from the front, because she kept her head down and looked backward when she walked. The boy shot Cougar to slow her down and ran off. Cougar then turned on Crane, who was ready. Crane had made wings for herself and, as she flew off, she shot and killed cougar.

As the boy walked along, he heard a woman singing in the distance. When he got near her, she stopped singing and refused to continue. Her sister appeared and joined the boy in urging her to continue. After five times, the woman began to sing the words "Summoning Heat" and the world caught fire.

The boy fled from the flames and looked for a refuge. He ran to Rock and asked for help. Rock said, "I snap and pop, sending off sharp pieces. You would not be safe." He ran to Water, who warned him, "I boil and you will be cooked. You would not be safe." He ran to Road, who said, "I will burn on both sides and roast all in my path. You would not be safe." He ran to Fir Tree who said, "I only burn on the very bottom. If you climb up into my branches, you will be safe." So that is what the boy did.

He climbed up into the fir tree, but the flames got closer. For safety, he grafted his bow and arrows to the top of the tree and used them to climb up into the Sky. Then he reached down and retrieved his bow and arrows to take along.

In the Sky was a big grassy meadow, where the boy wandered until he found a path and followed it. First light began as he walked along. He saw movement ahead and stepped off the trail. A Grey Elk went by. Soon after, five Grey Dogs passed. Then came a Grey Man. The man stopped and called the boy over. They talked. The man said he was Dawn. He had five daughters up the trail. The boy should go to his home for food and marry the girls. Then Dawn went on and the boy resumed his trek.

He walked all day before he saw movement ahead. He stepped off the trail while a gaunt man who looked like a walking skeleton went by. Soon after, five Dark Dogs passed. Then came a Dark Man, who called the boy over. They talked. The man said he was Dusk. He also had five daughters. The boy should go to his home for food and wives. Then Dusk went on, and the boy went in the opposite direction.

He came to a fork in the trail. The right side was dark and grassy, but the left side was dimly lighted and paved with dry cedar bark. The boy took the dim side by mistake. Dawn, who had his own light, went by the dark trail, while Dusk used the lighted one. Thus, the boy got to the home of the daughters of Dusk. The youngest and smartest one knew when he got there.

His first impression was not favorable. The girls were smelly, dark, and had big noses. They welcomed him and rubbed him over with oil from human corpses. This changed his senses, and he liked the four girls and married them. They tried to feed him human flesh, but he dug up nearby roots and ate those instead. He threw away the flesh when they were not looking.

The oldest (fifth) daughter stayed in a coffin-like box. During the day, while her four sisters were out getting food, the boy (now a man and husband) and older sister visited. One afternoon, a man came to the door. He was called Split Foot. The oldest sister took the visitor away and the boy did not see him again.

That night, Dawn came home and asked if the boy had arrived, but his daughters never saw him. So he sent his daughters to get him from Dusk's daughters. When the Dawn girls arrived, they demanded the boy, but the Dusk girls refused to give him up. The girls fought, while the boy peeked through a hole in the wall. The eldest Dusk daughter used a human leg as a club, and the boy saw that it was the leg of Split Foot. He also noted that Dawn's daughters were bright and beautiful.

The Dusk daughters drove off the Dawn daughters, but the boy had made up his mind. Five days later, he explained that he needed to stretch his legs and was going for a walk. Once he was out of sight, he ran back down the trail and turned into the dark fork. In no time, he was at the house of Dawn. Four sisters greeted him. They washed him and dressed him. They fed him elk meat. He was very happy.

One day he went for a swim and returned to the house looking for a comb. He looked into a basket hanging from the wall and found the youngest, smartest, and most beautiful daughter. He took to his bed, he was so stunned. That night when Dawn came home he asked why the boy was abed, the other girls explained that he found the youngest daughter. Dawn roused the man and told him to marry the girl in the basket. He was delighted.

One day, as they sat in the sun while his wife was grooming his hair, the man poked a hole into the ground. He looked down and saw Flytown. He saw that his natural mother now had a younger son. He became very homesick and again took to his bed.

When Dawn came home, the youngest daughter explained why her husband was not feeling well. Dawn told her to go to their grandmother and ask her to take them to earth. This grandmother was Spider, who agreed.

Dawn gave the couple many gifts, including a goat wool blanket, dentalia, roots, meat, and fragrant oils. They took these into a basket, and Spider lowered them down. In this way, many treasures came to earth.

The couple landed near the spring where the town came for water. They waited. Soon the younger brother arrived. He was blind, potbellied, and awkward. The man called him over, but the boy did not believe him at first. Dawn's daughter brushed the boy's body and he became slim and handsome. Then his brother blew into his eyes so he could see. His brother also patted his head so his hair grew in thick and lustrous.

The couple told the boy to go to his mother and say that her older son had returned safely. She should clean the house so that her new daughter-in-law from the Sky could live with them in a fresh and purified environment.

When the boy got to his mother, however, she did not believe him and scolded him severely. She too was blind, but she refused to touch her son and learn the changes to his body. The boy went back and was made older, slimmer, and more handsome. Five times he returned to his mother and was scolded. But the last time, she touched his body and believed. She too came to the spring, and she too was given sight, thick hair, and a nice figure. Then she cleaned the house thoroughly. The couple moved in.

Because the natural mother had abandoned and lost her first baby, she had been shunned by her relatives and friends. Eventually, Bluejay had claimed her and her younger son as slaves. Bluejay had been off when the couple came to earth and improved their relatives.

Bluejay arrived back home and crouched on the eaves of the house, calling to the young boy, "Wipe me off! Wipe me!" The younger brother realized that he was now free and looked at his brother, who nodded slowly. It was time for revenge. So the boy reached into the fire and grabbed a burning stick. He shoved it into the place that Bluejay wanted him to wipe. Bluejay screamed and flew off, realizing that he was no longer in charge. But he too would have his revenge.

In time, the Dawn wife became pregnant. Because she was at Flytown, she gave birth to twin boys joined at the back. For this reason, flies are sometimes stuck together today. In five days these Siamese twins grew into boys. Their father made them bows and arrows. He set up targets at each end of the house so the boys could stand in the middle and shoot in opposite directions. Everyone enjoyed this game.

Bluejay came to watch. Five times the twins passed in front of him. The last time he jumped up and cut them apart. They fell down dead. Bluejay said that twins would always be born separated from then on.

The twins' mother, Dawn's youngest daughter, was grief stricken. Her children were dead. She brooded for a short time and then decided to revenge herself on Flytown. She took a sharpened stick and stabbed everyone there, killing them. From each hole, flies emerged. Ever since, flies have hovered around wounds.

> The couple called to Grandmother Spider to pull them back into the Sky, and she did so. But they left all their treasures, foods, and gifts on earth for good people to use in the future.
>
> And so, the world became more like it is today because of the deeds of these people. In addition, this epic teaches that the easiest path is not always the best one to take. (Thompson and Egesdal 2008)

A Landscape in Flux

In the early morning light on the Muckleshoot Plateau in the village of *sbahl'wh-koh-ahbsh* the morning sun illuminated the fog that lingered in the tall conifer trees that lined the canyon-like walls surrounding the village. It started as any other day; women were processing camas and getting them ready to dry on mats in the afternoon sun, children played with one another, and a few men were setting out to hunt elk that frequented the area. Suddenly and without warning they heard a deep rumble coming from the river valley. At first they were unsure what to make of these unfamiliar sounds but they knew *Takhoma* (Mount Rainer) had a temper especially when he was fighting with his two wives *Lawelatla* (Mt. St. Helens) and *Patu* (Mount Adams). They decided that they should probably move to higher ground just to make sure they remained safe and to investigate what those rumblings were. As the small group of villagers moved up the steep canyon-like contours of the area they began to notice that the river was changing from its normal milky white coloring to a brown deluge packed with mud and debris. Awestruck by the sheer power of nature and the mountain that for many millennia had loomed in the distance they stood motionless watching the disaster unfold. In a matter of hours the river of mud quickly developed into a lake that filled the small valley with viscous slurries of mud and debris. It took a few weeks for the valley to drain, but as it did the villagers started to see a changed landscape as the water began to recede. What was once a valley nestled in the contours of the land had now been carved out by the massive wall of

water. In what seemed like a blink of an eye, their home had developed into a flat plateau leaving small hills and wooded outcrops in its wake. Once the water had fully drained the people realized that there had been massive amounts of mud and debris left behind. The floor of the valley was sealed below at least sixty feet of mud. As the villagers began to venture down off the hillside they saw other animals immerging to investigate the damage. Birds darted across the sky surveying the land and deer pensively stepped out of their hiding places now that the flood waters had begun to recede. The closer they got to the newly deposited mud they began discussing how they would work with these new set of circumstances. People began to bicker and squabble with one another as the stress and tension of the situation began to set in now that the chaos and uncertainty had subsided. Suddenly one elder spoke up to quiet her nervous family. She reminded them that they have always thrived within the area just as their ancestors had and that no matter what obstacles developed the animals and plants had always returned. With this indisputable wisdom, the people grew quiet and looked at the sun. It was going to be a new day.

Unpredictable events in the Pacific Northwest are nothing new to the indigenous groups within the area. Since time immemorial people have adapted and changed to an environment that is constantly in flux and can at times be dangerous and unpredictable. Our landscape within the western portion of Washington State has been changed by many different factors, whether it was glacial ice advancing and retreating, the Osceola Mudflow some 5600 years ago (Anderson 2013) as mentioned in the narrative above, or massive earthquakes. Indigenous communities and the flora and fauna within the area have adapted to these events. Some creation stories and other oral narratives have illustrated these events to fully explain the histories of their people. Some of these stories can help shed light on what is

a looming and omnipresent threat to the people who currently live on the west coast of the United States. The narratives that follow are an example of how these stories can be used today and again reflect the resiliency of the indigenous people, plants, and animals within the area.

On a cold January night in the year 1700, in what is presently part of northern California; Earthquake was running up and down the coast. His feet were heavy and when he ran he shook the ground so much it sank down and the ocean poured in. That same night, farther up the coast in what is now Washington, Thunderbird and Whale had a terrible fight, making the mountains shake and uprooting the trees, said the Quileute and the Hoh people; they said the ocean rose up and covered the whole land. Further north on what is now Victoria Island, dwarfs who lived in the mountains invited a person to dance around their drum. The person accidentally kicked the drum and got earthquake-foot, said the Nuu-chah-nulth people, and after that every step the person took caused an earthquake. The land shook and the oceans flooded in and people didn't even have time to wake up and get into their canoes, and "everything then drifted away, everything was lost and gone" (Finkbeiner 2015).

Figure 1: "Thunderbird and Whale had a terrible fight" Illustrated by Jeffrey Veregge (Finkbeiner 2015)

It is important to understand the historic and cultural contexts of an area that is being researched. Within the indigenous creation stories of the Pacific Northwest region and more specifically the coastal regions that this research is centered upon, are overarching themes involving resiliency, return, and perseverance in the face of adversity. In the beginning of this chapter a traditional creation story called “Fly” was presented. This story, like many other creations stories, offers wisdom to those who read it. It has overarching themes of gratitude for the plants within the region and explains that taking the easiest path is not always the best course of action. This teaching perfectly demonstrates the struggle many contemporary native groups are facing. As a result of colonization and industrialization, maintaining a traditional foods diet has become increasingly difficult. But as we see within the teachings of “Fly” things that are worth having sometimes require tedious work and dedication. Preserving traditional lifeways can be difficult in modern times, but these lifeways are a critical part of their cultural identity, and the struggles they face are worth the effort to maintain them.

Themes of overcoming adversity, perseverance, and preservation are common in many stories within the area. The people, plants, and animals always return. Even in the wake of devastating 9.0 magnitude earthquakes, lahars, and volcanic eruptions, things come home;

they return. This unrelenting return has been reoccurring ever since the beginning of time; in many instances the return was an unfaltering fact of life. But presently within the area things have changed. Animals and fish are no longer returning to the places they have called home for so long. Streams and rivers within the area once full of spawning salmon are sparse or nonexistent now leaving families that depend on them with little other choice but to adapt and change. Plants that were once abundant and nurtured by local people are fewer and far between as time marches on. But why has this changed now? What has occurred in the past and the present that has altered a system that has for many millennia marched unwavering to the beat of its own dependable drum?

The goal of this research is to better understand why these changes have occurred and what we as a group can do to fix it. This research includes two important focuses: the environment and the people. As researchers we wanted to better understand how the restoration of the three native plants involved in this research into their traditional areas, and more plants in the future, can help restore other vital parts of the ecosystem such as salmon runs. We also focus on community outreach programs to teach people the wealth of knowledge they once had and to bring it back. As stated in Tom Ball's quote from the beginning of this section, "the things that help us are the things we already had."

Three Important Plants

> *"…flowers in general. Flowers are the valuables of the earth or mountains and if they are plucked ruthlessly the earth sorrows or cries."* Then after an inscription in Nlaka'pmx, comes the entry*:"…grass in general. Flowers, plants, and grass especially the latter are the covering or blankets of the earth. If too much (are) plucked or ruthlessly destroyed (the) earth (is) sorry and weeps. It rains or is angry*

> *and makes rain, fog, and bad weather."* – A description of the Earth's Blanket taken from James Teit's handwritten notes when he lived and worked with the Nlaka'pmx in the Interior of British Columbia in the late 1800's and early 1900's. (Turner 2005:20).

These two entries represent a cultural belief, a sanction against destroying culturally and ecologically important species and habitats (Turner 2005:20). These cultural beliefs among many indigenous groups within the Coast Salish region are prevalent within the area and they treat their home and the plants that grow within the region with respect and appreciation. A direct and reciprocal relationship exists between plants and people and the land that they call home. People who fail to act in the best interest of their environment were met with immediate and direct consequences (Turner 2005:20). Another important indigenous teaching encompasses the idea of calling things "people". An example of this would be tree people, plant people, and salmon people. Many indigenous groups refer to different plants and animals as people because they believe that when they are thought of as living beings human people are less likely to be greedy and disrespectful as they give their life in order for the people utilizing their gifts to have life (personal correspondence with Valerie Segrest). The three plants that this project focuses on are just a small insight into the diverse plant foods used by the people living in this region since time immemorial. It is also only a small glimpse into the way that indigenous groups see and interact with the flora and fauna that also call the area home. Many plants that were utilized within the region, each held their own cultural significance, and all deserving the respect and stewardship of the groups using their gifts for nourishment, clothing, and wares.

Historically *Q^{w}lawl* or blue camas (*Camassia quamash L.*) was one of the most important and most famous food plants in the Pacific Northwest for indigenous people. The word camas is actually derived from the Nootka word "*chamas*", which means "sweet" (Turner and Bell 1971:75) (Tilford 1997:20). Within certain parts of the region where trade with French voyageurs was common, a different dialect of language called Chinook Jargon emerged. Within these areas camas was also called "*lacamas*" (Gunther 1945:24). This plant has brilliant star-like blue and purple blossoms that can be seen in the months of May through early August. Harvesting of camas usually began in May and continued throughout the summer. In British Columbia where the Saanich language is spoken, the month of May is actually called *pənex^{w}əng* which translates to "moon of the camas harvest" (Turner 2014:37). Prior to contact with Euro-Americans, camas was an important source of food and commerce within the Pacific Northwest region. Camas was a vital aspect in a lively and integral part of trade throughout the area and into the Columbia Plateau region. Camas was sometimes exchanged in the form of loaves of dried, cooked bulbs, some over 4.5 kilograms, which the Nez Perce and Sahaptin traded for horses, although the exact equivalency is unknown (Turner 2014:127).

Figure 2: Blue Camas (*Camassia quamash L.)(Heritage Seedlings, 2015)*

Recent lab analysis of camas has shown that the plant is rich in protein and a good source of fiber, calcium, phosphorus, and iron (Harris 2003:512). Camas also contains a compound called inulin. Inulin is a complex sugar that emerges from the complex carbohydrates within camas once the bulbs of the plant

are subjected to low heat for an extended amount of time within earthen ovens. Unlike most sugars, inulin is unique because it does not affect or alter blood sugar levels when it enters the blood stream. The complex carbohydrate that is found within camas needs special preparation to be digestible in order to avoid stomach pain, and as a result it is important to cook camas prior to ingesting it.

Figure 3: Muckleshoot girl, granddaughter of Anne Jack, wearing a tumpline is made of maple bark (Sturtevant et al. 1990:494)

Bulbs were dug using a pointed stick made from Pacific yew (*Taxus brevifolia*) or Ocean spray (*Holodiscus discolor*). Presently modern groups harvesting bulbs use digging sticks called "cuppins" which are made out of iron. Once bulbs were harvested they were placed into tumpline baskets, or in later years, potato sacks. Traditionally after the bulbs were gathered they were cleaned and then steamed in pits for up to three days until the bulbs began to get firm and blackened in color. Sometimes they were stored in cat-tail (*Typha latifolia*) bags, but apparently they did not keep well when cooked. Some people dried the bulbs on mats without cooking them as well. Blue camas is also a great side with other plants, such as Black Tree Lichen (*Bryoria fremontii*), Bitter-root (*Lewisia rediviva*), and onions (*Allium spp.*) or meats such as salmon or deer (Turner 1997:67). The roots of camas were also eaten by expectant mothers within the Makah tribe to produce labor in case of a protracted delay (Gunther 1945:25). Women would frequently locate these camas plants prior to giving birth in case any issues arose with their labor so they would be easily located in cases of emergency.

Historically camas has been tended and cared for by many native groups throughout the region. Camas prairies and fields were divided into plots for many different families or clans to tend and harvest. Each field was cleared each season and sometimes subjected to small controlled burns to increase a higher yield and healthier plants in the seasons to come (Harris 2003:512). These controlled burns were usually created so that the fire would burn quickly over the ground, killing back brush and seedling trees but not harming the grasses and bulbs, which were dormant by this time (Turner 2014:40). As mentioned previously, women and children harvested camas between May and August. They lifted out the soil in small sections removing only larger bulbs to ensure better crops the following year (Harris 2003:512). After the camas had been harvested the empty soil that had once held the bulb was replaced with broken stems that held seed pods within them. This is a practice that still occurs today when people harvest camas. They then covered the holes with top soil and cleaned up the beds for next year's harvest. The highlight of the harvest included celebrations, first food ceremonies, and feasts to give thanks for an abundant harvest.

Figure 4: Death Camas (*Zigadenus venenosus*) (Knoke, 2013)

The dangers associated with eating native or wild edible plants must be clearly understood. Great care and a deep understanding of edible plants must be present when harvesting wild plants to avoid any confusion or medical complications. Camas is no exception, and those interested in harvesting this plant for consumption should be careful to never confuse the bulbs of blue camas with those of the closely related death camas (*Zigadenus venenosus)*. It is regarded as a violent emetic and sometimes used as such, but on account of its poisonous nature it is usually avoided (Gunther 1945:23). As a man named Haskins states "… at times the bulbs of death camas were powdered and applied as a poultice to cure boils, rheumatism, bruises, sprains, and to relive pain-" (Gunther 1945:23). However, which coastal group used death camas in this way is unknown. Death camas commonly grows together with blue camas, and the leaves are difficult to distinguish. Also, the bulbs are similar in size and shape. The only distinguishing aspect between death camas and blue camas are the petal colors. Death camas has cream-colored flowers that are smaller and in a tighter

cluster than those of the two blue camas species (Turner 1997:67). Anyone wishing to sample blue camas should dig them up while the plants are flowering to avoid any possibility of misidentification.

Figure 5: Chocolate lily *(Fritillaria camschatcensis*)
(Niebrugge, Wild Images)

Q'awax or chocolate lily (*Fritillaria camschatcensis L.*) is a plant that holds cultural significance within the Coast Salish region as an important root vegetable. According to the Haida people of British Columbia, chocolate lily was used to "vanquish" Salmon people (Turner 2014:270). Hanaksiala people of British Columbia also featured this plant and other flowers in a special ceremonial Flower dance (Turner 2014:305). From the months of April to July a discerning eye can see this flower's beautiful and rich colors which range from shades of dark brown with shades of green and rich brownish purples. The flowers are sometimes speckled with green or yellow spots or streaks and usually bloom close together. They also have a unique scent that some may consider foul but the plant itself has evolved to attract its pollinators which are predominately beetles and carrion flies (Joseph 2012:26).

Chocolate lily was traditionally used extensively throughout the region. Many historical accounts and the archaeological record show that this plant has been a part of

extensive cultivation efforts by indigenous peoples in the northwest. This active cultivation of plants taking place in pre-contact North America is a piece of history that was absent in most early writings by anthropologists and other Europeans documenting indigenous lifeways (Joseph 2012:11). Traditionally, chocolate lily and other edible roots were cultivated with methods such as tiling, weeding, and fertilizing, but they also included large scale alterations of the natural environment to increase the productivity of preferred species (Joseph 2012:11). Root gardens that could house edible bulbs, like chocolate lily, were also created in estuaries that were located in specialized zones that were above the high marsh and into the transitional salt-tolerant meadows. These zones are high enough into the estuary that they are infrequently inundated with salt water but low enough to receive water from occasional flooding (Deur 2005). Within these root gardens, some people removed rocks and even enhanced soil profiles for ease of harvesting (Deur 2005). These patches were tended and "owned" by chiefs and families or clans. These practices were common among the Kwakwaka'wakw, Ts'msyen, and other Northwest Coast peoples (Turner 2014:187). These root gardens may have offered a reliable source of food in traditional diets where the availability and abundance of most foods varied considerably from year to year (Joseph 2012:13). Root gardens also offered important supplements to diets in the years when salmon runs were less bountiful or when other food sources were running low.

The cultivated bulbs of the chocolate lily added an important source of carbohydrates for a traditional diet that was typically composed of high proteins, oils, fats, and fiber. These bulbs were eaten by almost all Northwest Coast peoples and were harvested, usually when dormant, in spring or fall. The bulblets are rich in sugar and starch and were a highly important component of traditional diets (Joseph 2012:16). Chocolate lily was traditionally

harvested by women and typically grows in shallow soil, as illustrated by the plants Haida name, *stła q'iist'aa*, that translate roughly to "round thing you dig out of the soil with your finger" (Joseph 2012:12). In Squamish communities in British Columbia preparation of plant foods was exclusively a woman's job and was one of the most desirable things a Squamish woman could aspire to do. The Squamish believed that if a female child was born with a mole on her back that child would be a good berry-picker or gatherer because berries and some other food plants were gathered in baskets on women's backs (Bouchard and Turner 1976:132).

Chocolate lily bulbs can be prepared in a variety of different ways, which differ by group, tribes, and by person. Typically, after the bulbs of this plant are harvested they are broken apart and then soaked in one or more containers of water to help remove their bitter taste. They are then boiled and eaten with oil or lard and are used in soups and in stews. Some groups incorporated barbequed salmon heads that were cut in half into boiling pots with the chocolate lily bulbs, allowing them to impart their flavors on one another. This preparation of the bulbs was considered a delicacy when eaten together (Bouchard and Turner 1976:51). Although aware of the bulb's bitter taste, some people still collect them and eat them raw. An account from Dr. Louie Miranda illustrated this fact when he reminisced on the "peppery" flavor of the chocolate lily when his mother used to gather the bulbs on the east bank of the Squamish River in British Columbia (Joseph 2012:16).

The *Fritillaria* species is related to both onions and garlic which could account for their bitter and peppery taste when eaten raw. Bulbs of chocolate lilies are high in starch. Some groups dried the bulbs and used them to make rice-like flour. This species is easily

transplanted, and grows from bulbs or seeds. Once it is an established part of a garden, it tends to spread. Chocolate lily also served as an important trade item in Coast Salish communities.

Figure 6: Balsamroot (Balsamorhiza deltoidea) (Legler, 2003)

Many people are familiar with the beautiful sunflower-like blossoms of the Balsamroot (*Balsamorhiza deltoidea L.*). During the spring they begin to shower the foot hills with hints of rich golden colors. This plant blooms in early spring, from March to April, when the leaves of Balsamroot begin to pop up above ground, and people begin to harvest the plants taproot before it becomes tough and stringy as the seasons progress from spring to summer. The taproot of this plant can grow as long as 30 cm, but most people harvesting these roots to eat prefer them when they are similar in size to carrots (Turner 1997:93). Although the larger taproots from mature plants are frequently overlooked for sources of food, they were frequently used to make different medicinal salves and solutions for many different ailments (Turner 2014:431). Succulent shoots can also be harvested from the plant at any time of the year. These shoots are eaten when foods were scarce or few other foods were available to eat. The shoots are located from the dead leaves and flowers stalks from the previous years' growth; people would dig them up and eat them raw.

Some accounts of "Sunflower roots" have been mentioned within some ethnographic pieces, which could be a description of Balsamroot. These ethnographic pieces were gathered by Marian Smith while she was working with the Puyallup and Nisqually tribes. She mentions that "Sunflower roots" were the best-liked of the root foods within the area. Smith went on to explain that these roots were dug earlier in the spring than any other roots. Once the large roots were harvested they were steam-baked for two to three nights and eaten "like a banana" (Smith 1940:250). Other accounts by Smith explain that after the roots were eaten, their tough cores were left to stand in water for several days. The resulting liquid was black and sweet (Smith 1940:252). This black and sweet liquid could be a result of the high fructose that is present within the roots after they are cooked. Other references of drinks made from the roots of this plant come from Pam Amoss who worked with the Nooksack people "The root of the wild sunflower was soaked in cold water for several hours, giving a very desirable drink" (Amoss 1978:24). Given that these roots are infused in cold or room temperature water this could indicate that this plant contains a high amount of mucilage. Mucilage is a thick, glutinous substance that is related to natural gums like agar. It is usually comprised of protein, polysaccharides, and uranides. Mucilage can be used medicinally as an external emollient and internally as a demulcent. Another species of Balsamroot (*Balsamorhiza sagittata*), which is native to the Columbia plateau region, is similar to the coastal variant (*Balsamorhiza deltoidea*). It was used similarly by the two different cultural groups so it can be hypothesized that their uses are similar. Balsamroot (*B. sagittata*) was also a well-known plant food. This plant also produces an aromatic resinous pitch, especially from the bark on its large, mature taproots. This pitch was used medicinally as a salve or wash (Turner 2014:430-31). The salve or wash was used to treat a variety of ailments including open sores, wounds, poison ivy,

impetigo, and ulcer stones. This plant's bark contains an antibacterial and antifungal compound called thiophene E along with other antimicrobial properties that give the bark and its resin its unique ability to both nourish and heal. In order to eat balsamroot it needs to be peeled to remove these substantial concentrations of thiophene E and the other compounds in order to detoxify the inner root so that it can be safely eaten. Balsamroot is only one of dozens of food plants that need special preparation to mitigate the effects of potentially harmful or seriously toxic properties (Turner 2014:433).

Balsamroot (*B. sagittata*) was a species of plant that was considered sensitive to inappropriate preparation techniques and is therefore subject to many different rituals and taboos (Turner 2014:320). During the time women were harvesting and cooking balsamroot, they were to abstain from sexual intercourse for the duration of these two activities (Turner 2014). On the interior plateau, when going out to dig some women painted their faces with red or black pigments. Men were not allowed to be near any of the cooking pits while balsamroot was being prepared. Sometimes while the women were cooking the roots, they spread out the small ends of four long, thin fir branches in different directions near the bottom of the oven where the roots were and then tied the thick ends together and raised them above the center of the oven so that they protruded a little from the filled-in oven. When the cooking was finished, these branches were pulled out according to their color, and the women could determine whether the roots were successfully cooked or not (Turner 2014:321). If the small fir branches were blackened or dark in color the roots were done. If they were spotted or still light in color they were unfinished.

In April and May, when the flower buds were still slightly closed, people gathered the buds and stems, peeled them, and ate them raw, steamed, or boiled (Turner 1997:93). These buds are said to have a pleasant nutty taste, reminiscent of the taste of young sunflower seeds. Balsamroot contains inulin. Similar to camas, the inulin in balsamroot is a complex sugar that is easily digestible and lacks an effect on the blood sugar of the person ingesting the plant. Inulin emerges when a complex carbohydrate, like the one found in balsamroot, is cooked or pit-steamed. Typically when people prepare the taproot of balsamroot they beat the roots to loosen its tough outer skin and then peel them. Once they are peeled they bake the whitish inner part of the root overnight (Turner 1997:93). Balsamroot is a versatile plant and can be eaten raw, baked, or dried.

Later in the season when the flowers of the plant have withered and gone to seed some people collected the small black seeds from the withered flowers by shaking them (Turner 1997:94). After the seeds were harvested they were sometimes laid out to dry in the sun or roasted whole. More often the seeds were placed into baskets or buckskin bags and pounded into a meal which they could later eat alone or with other foods such as berries. People also mixed the meal with deer fat, grease, or water boiling the mixtures and forming them into small cakes or bread (Turner 1997:94). Properly dried seeds could last up to six years if they were stored in airtight containers (Turner 1997: 94). Although it has a rich and nutritive history in the diets of people within the Pacific Northwest, balsamroot is seldom eaten today (Turner 1997:94).

The relationship between indigenous groups and the land is very strong. The land offers what they need to survive and to thrive in the areas that they have called home for so

long. This relationship is present in the creation stories within the region and the teachings passed down from generation to generation. One excellent example of this relationship comes from the conclusion of an Nlaka'pmx story called "Old One of the Nlaka'pmx" that says "When he finished teaching them, he bade them good-by, saying, I now leave you; but if you forget any of the arts I have taught you, or if you are in distress and require my aid, I will come again to you. The sun is as your father, and the Earth as your mother. When you die, you will return to your mother's body. You will be covered with her flesh as a blanket, under which your bones will rest in peace" (Turner 2005:47).

The importance of plants within the lives of Coast Salish people is complex and interrelated. Through food many people associate roots with their cultural identity, the ancestors who once ate them long ago, and with a wealth of health benefits. Before European contact many Coast Salish People actively harvested and cultivated these plants. Their stewardship of the land was one of great respect and reciprocity. Throughout the course of history many obstacles and destructive events have occurred that have impaired the use of traditional food plants in past and present indigenous people. Euro-American contact, colonialization, and in more recent years urbanization and ecological concerns have served to hinder the availability and uses of traditional food plants. These factors have had disastrous effects on the uses of these plants. Although the knowledge is still present, fewer and fewer people have the means to access these plants. Even in the face of all of these challenges, many indigenous groups within the area have made strides to revitalize, preserve, and retain the traditional knowledge and accessibility of these plants. The Muckleshoot tribe continues to develop more programs like community gardens and community classes that will ensure that this knowledge is retained rather than lost and that these food plants are available to present

and future generations. These programs do more than provide a link to traditional plant uses since they also provide a means for acquire healthier food options and education programs that ensure people stay informed about the foods they ingest and continue to incorporate Coast Salish teachings into their daily diets.

CHAPTER 2: RESEARCH METHODOLOGY AND ETHNOGRAPHY

Methods

The role of plants in people's lives can provide helpful insights into how different people see the world. Certain plants can become key parts of daily life and in turn become a key component to their cultural identity. In developing a partnership with the Muckleshoot tribe I began to understand these relationships and appreciate how important they are to their lives. With their guidance, I develop a finished thesis that reflects what they believe to be important aspects of these relationships. A goal of this research was to promote these plants and help integrate them into the gardens of people within the community. In doing so my hope was that the restoration of these plants can begin to foster a means of access to more abundant traditional native plant foods, continued use for future generations to enjoy, and an increased amount of conservation of native plants within the area.

This study was designed to be a qualitative case study that fostered collaboration within the community and built upon the strengths the community already possesses. This study was a joint research project in partnership with Muckleshoot tribal member, Valerie Segrest, using snowball sampling or chain-referral sampling technique. By using this non-probability sampling technique, we would recruit future interviewees from among their acquaintances within this tight-knit community. Initially we had intended to conduct many of these interviews with respected elders and prominent figures within the community. During a preliminary presentation of the proposed project to tribal council, tribal council chairwoman Virginia Cross shared her concerns about how much information was available within the community on the three plants explained in this project. Unfortunately, the uses of these three plants within the community currently are marginal; this marginalized plant use was the

catalyst for this research project to develop into more of a revitalization effort. We began researching socio-economic reasons for the decline of these plant uses and further investigated the environmental effects that could be causing these declines. Although fewer interviews were completed than we originally expected, key interviews with the cosponsor of this project were used to better understand past, present, and future plant use within the Muckleshoot community. Virginia's insights were helpful in understanding more about what programs and classes the tribe is developing to continue to foster a more pronounced number of traditional food plants and fresh produce used in the diets of people currently living within the community. She was also able to reiterate important aspects of why this research is important and why similar projects must continue in the future.

Existing data was collected from archival research sessions special collections library at the University of Washington and the University of Idaho. Scholarly publications and existing ethnographic accounts of the Coast Salish region became prominent means of gathering a large portion of the data present within this research and also served to develop the research questions that were used in key interviews with Valerie. These existing forms of data served as a means to gather an understanding of the socio-cultural processes and socio-cultural meanings that are present within the community. The socio-cultural processes investigated within this project included the interactions of individuals with and within their significant social systems, with their occupied physical environments, and shared histories. Socio-cultural meanings were attributed to the meanings that individuals and their social systems apply to social system relationships, the physical environment, shared historical patterns, and the patterns of basic human need fulfillments.

This research investigated on three plants in particular which included- camas (*Camassia quamash*), chocolate lily (*Fritillaria camschatcensis*), and a species of balsamroot (*Balsamorhiza deltoidea*) native to western Washington. A primary goal of this research was centered upon bringing back knowledge the communities once possessed by developing community classes centered on these three plants and giving people the means to plant and grow traditional food plants within their own gardens. Due to the seasonal nature of these plants these classes will take place after the 2016 academic year and will be completed on the graduate student's personal time. The curriculum for these future classes is located in the appendix section at the end of this document, which outlines the class and its content. One concern of this study was the idea of conservation among native plant species. Any culturally sensitive information as determined by the Muckleshoot tribal council was not publicly disseminated without Council approval. Once information was approved by the tribe it was presented at "The Living Breath of wəɬəbʔaltxʷ" on May 13-14, 2016 at the University of Washington which is a conference set up to discuss key aspects of indigenous peoples in the Northwest and how they maintained a sustainable way of life through a cultural, spiritual, and reciprocal relationship with their environment. This symposium was designed to foster dialogue and build collaborative networks as many Native peoples within the area, strive to sustain their cultural food practices and preserve their healthy relationships to the land, water, and all living things.

Although this research excluded plants that were culturally sensitive, the research followed a strict protocol that protected the information prior to being presented publicly. In order to do so, the tribal council was consulted and updated as the project progressed to make sure they had an active role in the final product of this research. They were able to look at the

progress that was made and offer suggestions and changes as needed throughout the research process and ultimately had the final say on what was included and excluded as the project progressed. In the beginning stages of this research process, we gained approval from the Institutional Review Board (IRB) at the University of Idaho to conduct future interviews with people within the community. The final product of this research was presented to Muckleshoot tribal council at one of their weekly meetings prior to being presented to the College of Graduate Studies at the University of Idaho. Once the tribe had given their approval, the final draft of this thesis was submitted to the College of Graduate Studies at the University of Idaho to gain approval from the institution.

Ethnography

Some sources of information for this research came from limited participant observations while spending time on the Muckleshoot reservation and at the home of Valerie. My first interactions with different people on the reservation came about while I was meeting with Val to discuss ideas for this research. While on the reservation I saw many different buildings that were dedicated to daily tribal affairs. Many of these buildings house different revitalization projects including their language center which was one of the buildings that contained the largest group of people engaged with one another that I saw that day. I was also able to witness the sovereign nature of the tribe at one of their weekly tribal council meetings where they worked with many entities within the area, both state and county organizations, to determine the course of action the tribe should take on future projects and to learn about current events taking place on the reservation that needed their attention. While at Val's home I was able to sit in her home garden with her and her two small children. As we talked her

oldest daughter quietly picked strawberries from a few different plants. She ate each one quickly and ventured back for more shortly after. Val planted many different child-friendly plants within her garden and encouraged her children to eat the fresh fruit present. Val and her family are examples of how a person can start learning about plants at any age and continue to encourage healthy eating and embrace plants at any age. This availability of plants within their lives serves to pass on Val's love of plants to her daughters and in turn traditional knowledge associated with them.

While interviewing Val I asked her what inspired her to pursue more information about traditional plant foods and what inspired her to help other people incorporate traditional teachings and food into their own diets. She explained that her mother was a foster child whose father was a man named Ernie Purcell. Mr. Purcell was one of the last living members of their family on the Muckleshoot reservation. As an infant Val's mother was fostered out to a Snohomish family and later adopted out. For most of their lives Val and her mother did not know where they came from. Many people told them they could be from several different tribes but no one could tell them where they were from with any semblance of certainty. Later in life Val's mother took a job with the government. She and Val traveled all over the world. Eventually they moved back to Seattle and her mother began working for a homeless shelter that housed many native people within the area. One day her mother decided to look up her father's name in the shelters database. She had little information on her father other than his name but when she searched his name she found him. As fate would have it her father lived a short distance from the shelter so she walked to his house and met with him. When they finally met he told her that he had been looking for her since she was born and he had been sending letters to her in care of the Muckleshoot tribe because that is where they were from.

Shortly after Val and her mother learned about their roots they enrolled as members within the Muckleshoot tribe. At the time Val was studying creative writing at a local university and knew very little about the tribe and what it all meant. Shortly after becoming an enrolled member with the tribe, Val got a job at the elder's center on the Muckleshoot reservation where she was in charge of caring for ten different elders. The ten elders she cared for were all sick with pretty serious illnesses and needed assistance. Val asked these elders what they needed to feel better and their answers were always the same. They all needed and wanted more traditional foods. For them these foods had healing properties and that was something that really spoke to Val. As Val continued to work with these elders she also began learning more about her family and her lineage that had passed. She found out that her family line was very prominent within the community. Her grandmother lived to be 108 and she was well known for eating traditional foods. This new information inspired Val and she decided to switch majors and began learning more about nutrition and started taking biology and organic chemistry classes. While taking these classes she realized that nutrition is a spiritual connection that we can have with food and that these connections are so much more important than numbers, calories, or what is on the plate. Val began seeing other problems within the community as well. Traditional foods like salmon and camas can be very expensive and she was inspired to dedicate her life to helping people overcome these barriers and help them maintain the reciprocal relationship her people have had with the land for so long.

Val's love for plants has been something that she is very passionate about. During a TED^{x}Rainer talk Val talked about food sovereignty. In the beginning of her talk, she explained the roots of the food sovereignty act and how it applies to sovereign tribal groups.

She explained that access to traditional foods has always been important to her people by saying,

> "In 1855, when many different tribal leaders from the region met with Washington governor Issac Stevens to sign the Treaty of Point Elliot her ancestor Pat Kanim was one of the first people to speak at the meeting. He wanted to make sure that his people would maintain access to their traditional foods whether it was wild game, fish, shellfish, berries or roots, and the cedar tree." (Blouer 1993, Segrest 2013)

Their first priority while establishing sovereignty was also food sovereignty. Later in her talk she explained why traditional plants and their seasonal return were important to her people by saying,

> "For the Coast Salish people, traditional foods are more than just foods and medicines… they are also their greatest teachers. They teach people without a spoken word which is much different than what people are used to today. Plants teach by example. Each year plants and animals return with abundance, this return of plants is seen as an act of love and abundance." (Segrest 2013)

Recently while talking with Val I asked her to explain more about what makes plant people such great teachers. She explained that plants are the oldest people on the planet. "They were here before fish, birds, animals, and humans. They were here to take root and hold the Earth together and to live their life for people to come in the future… they do this without a spoken word". Val explained what she meant by "without a spoken word" by explaining that "plant people are humble, they do not brag about what they do, they just live as an example and hopefully people see that and aspire to it and hopefully when they are gone people think of them and tell their story and they aspire to be like the plant people". She went on to describe the differences between human people and plant people by saying that "in comparison to plant people humans are pitiful… we don't have the power to have the powerful medicines… we have to ask them for permission and borrow it so we can take their

wisdom into our bodies. They are our elders and we must spend time with them and treat them like they are our best friends, these relationships can become powerful and these little people can share their wisdom… it is a human's job to make sure that they are protected and respected".

Val and many other Coast Salish people believe that plant people provide lessons on how they should act. Her main goal within her work is showing people that they can eat like their ancestors did. She has organized many different workshops on plant preparation and helped different tribal organizations develop means to attain different types of produce and traditional food plants. She says that people are sick of being sick. One hundred and fifty years ago diabetes and heart disease did not exist within tribal communities because indigenous groups were eating a diet based on the land and the seasons and a protocol that ensured an abundance of foods, and that is what Val would like to return to. According to the Centers for Disease Control and Prevention (Segrest 2013), Native Americans have disproportionally high rates of diabetes, heart disease, mental illness, obesity, infant mortality, and other illnesses. The need for programs like the one's developed by Val and her colleagues is great. Val's vision for many of her programs is not a return to the past, but instead to find modern incarnations of ancient foods and an emphasis on eating a diversity of unprocessed foods. She strives to help people navigate the modern-day health systems and to be a translator between ancient healing practices and modern ones. She explained that the major and real focus of her programs is self-determination. As she has worked with many communities throughout the Pacific Northwest she has begun to notice that there are not enough people teaching and there is no enough cultural transmission occurring. So the focus of her programs has become "a stew pot" that produces educators and policies that help

people. These people become the eyes of their local food systems and ensure other people within the community are included and have a voice in their own food systems as well. She explained that “there are so many departments that are dedicated to fish and game but no one is an advocate for the people and the plants which are so important because those relationships reflect their past”. A personal goal for not only the Food sovereignty program but also Val as one of the project coordinators is developing a means to outline the problems within the community and help solve them. She also wants more people to become champions of their own food sources and says “that more people need to do more of the work for it to really thrive”. Val has learned that to be a good teacher one must allow the students to make their own discoveries.

Empowerment is a key aspect to Val’s work. She believes that people can be change agents within their own food systems. Val often encourages people to look around within their communities and see what is not being done and encourages people to fill those niches. She uses the example of blueberries by saying “if people need blueberries, grow them! In doing so you become a staple within the community which makes you and calls you to become a citizen in the community and makes other people ask “how can I be useful to the community?” Val believes that becoming your own change agent and getting involved within your community is not just one person’s issue she says that “it is your issue, it is mine and it needs to be a group effort” adding that “You must become part of the solution because it cures a lot of our own issues”. Val dove deeper into the issue and explained that many people can have intolerable conditions within their lives that they do not fix. Instead, some people can become compliant or complacent with where they are in their lives. She believes that food systems are not separate from these issues and said that “traditionally people felt a sense of

purpose, people were able to share and display their harvests, and now we don't have that anymore. Instead we have high rates of addiction and suicide… you need more traditional avenues to stay sober and to begin healing whether that is growing food for your family or the larger community".

She says that eating should be fun. There is no need to bombard people with statistics and fancy words. Instead, there should be a means of allowing people to take charge of their own health by asking them what they think the solutions are. Val knows that lecturing people about their eating will not change their behavior. Instead, she says ninety percent of her work centers around listening to people and helping them make small life changes that will lead to bigger changes on their own. While Val encourages people to be their own change agents and champions for their own food systems she acknowledges the huge challenges that are present when it comes to accessing traditional food sources. She explains that "many people think that plants are really prevalent so they take them out and replace that plot of land with buildings; unbeknownst to the land developers they just removed a berry bush or camas prairie from someone who has been harvesting that bush thoughtfully for many years". Val believes a major contributing factor to the loss of land to urbanization stems from preservation officers in the county because "they tend to think of the present without looking at the past… we have to consider invisible losses that occur when people mow grassy fields or remove bushes for agricultural purposes or urbanization." The removal of natural foliage and habitat takes away food sources for suffering communities… whether it is a sense of longing and misplacement, which leads to addiction, and whether they have access to foods that prevent diseases like diabetes from becoming so prevalent.

A major teaching that I have come across within the literature is the idea of "mindful harvesting". While I understood what it meant on some levels I was curious what this idea meant to Val and why she believed it was important. She explained that "plants have a body, a mind, and a spirit. Because of that we can talk to them directly. We can do that with our minds and our intentions". She practices mindful harvesting by thinking about the people who will be receiving that medicine and how she wants the people to feel nourished and whole inside again while enjoying the plants that she has harvested for them. Val explains this thought process as "a creative visualization of a light coming into the person eating it and the strength that it give them to carry on." She believes the plant people hear these thoughts and show up to help those people being visualized and make the thoughts a reality. While Val is connected to many plants stinging nettles hold a special place in her heart. She explained to me how she uses mindful harvesting techniques when she harvests these plants. She said "if you're mindful the nettles will not sting you… if you're gentle and slow the plant will not sting you". Val believes this in and of itself is a valuable teaching saying that "the nettles and other heavily armored plants like devils club teach us without a spoken word but it reminds us that we must be thoughtful an accountable for your actions and to be present within the moment because if you're not slow and thoughtful you will get poked or stung".

At the end of the interview I asked Val about the lessons that she had learned about traditional foods that had really inspired her or shaped her into the person she is today. This question proved to be one of the most important messages that I took away from the interview itself. Val began by saying that she used to be a person who felt she needed to do everything and she dreaded group work. However, she learned that within communities group work is fundamental. She began to realize she could not possibly know everything that she knows

today without the help of others. Val believes that it is imperative to people's healing stories to be afforded the opportunity to share their gifts whether they are a fisherman, a hunter, or a gatherer. In order to heal she believes that people need that opportunity. She then shared that within Coast Salish communities many people believe that "you should teach each of your children something different. If you taught them everything no one would need each other… this way people have a gift and a sort of wealth that they have to share with this world, and it teaches people that we need one another to survive". Val ended the interview with one of the most poignant thoughts of the day by saying "it is not a one-person revolution… that does not exist or work; it is part of our responsibility to hold space for people… to provide platforms for people to share their gifts".

Archival Sources

While constructing the methodological framework for this thesis it was important to comb through the literature for ways to frame the background of this research. The following primary sources gave an understanding of past methodological frameworks and provided guidance from established figures within the field of ethnobotany. In some instances these sources have shed light on how researchers have performed their research within other Coast Salish communities. Nancy Turner is a prevalent figure within the Pacific Northwest because of her research with indigenous groups. Most of her work has taken place within British Columbia and in Washington State. With this in mind and her intensive work within this region, her research provided useful methodologies and ideas on researching other groups within the Pacific Northwest. Because most of her work has been done with coastal Salish communities in Washington and British Columbia, her work is invaluable.

Turner (1995) wrote about the history of ethnobotany and explained some of its advances over the years. She went into great detail on the work that has been done throughout the region. She described what she believed to be the key components of the ethnobotanical research elaborating on what can be done with this kind of data. Turner also went into detail about the field's political turns and the responsibilities researchers have with how they present their information. A very helpful aspect of this paper was the number of references she used which enabled me to begin gathering more potential sources of literature on the subject. It is also possible with this article to begin to see where most of the work has been done within this region. It also illuminated the limited amount of research that has been done within the Southern Coast Salish region. Most importantly she raised many valid points about the responsibilities of the researcher. She explained that many plants can be poisonous if mishandled or misidentified; to try and remedy this situation she gave proper etiquette on what should be done to curtail the misuse of plants (Turner 1995). This particular aspect was very important given the nature of duality between the pharmacological and edible nature of many plants. This had a lot of relevancy to this research topic because balsamroot and camas can both have dire consequences when misidentified or prepared incorrectly.

Some of her more helpful passages were about the preservation of native plants. One factor that Turner highlighted as a concern within her article was the threat to native plant species caused by the expanding logging industry and other industrialized activities that continue to be a prevalent issue in many forests. She also explained how the introduction of invasive plant species has had an adverse effect on many native plant populations. With these factors in mind she stressed her concern regarding over-harvesting and intensive use of already fragile native plant populations. This was a detail of the research I had considered

prior to starting this research. She offered the suggestion of wide-scale farming endeavors to help native plant populations. Turner also suggested these wide-scale farming endeavors may be a future route for the field to take and seems like it may be an aspect that I could pursue as I continue my career.

Overall this article was immensely helpful. She explained some of the methodology that researchers within the field use and incorporated some of her own research to highlight the field's potential. Her work served as a starting point for this research. Many aspects of her article contained ideas that were critical in understanding what an ethical methodological framework looks like and helped highlight the potential of what this research could entail when it was in its beginning stages. Turner went on to explain the importance of native informants as experts and educators and how their contributions have helped make substantial contributions within the field. She explained the potential benefits of the indigenous perceptions of plants and suggests that researchers within the field should continue their collaborations and regarded them as essential to ethnobotanical work today.

Lipp (1995) described some of the political and methodological changes within the field. He explained the fields developments in the 1980's which saw shifts toward ethnobotanical mitigation that were aimed at protecting and transplanting plant resources and added a component of federally mandated vegetative management and environmental impact programs to the field (Lipp 1995:52). He also explained the difficulty of incorporating a singular theoretical framework and methodology that can encompass the diversity within the field without limiting the potential of the researcher's data. This portion of the article stressed the necessity of excluding theories from the data until after fieldwork has been completed. He

argued that imposing these theories too early can limit data collected and prevent research from telling the entire story (Lipp 1995). He also believed researchers should use both inductive and deductive reasoning, which can help the data intertwine in ways that the researcher had not thought possible.

The second half of Lipp's article was focused on the research that had been done in the field. He cited Nancy J. Turner's work (1977), with the Tlingit's use of black lichen and explained some of the stories that the tribe told about its uses in the area. Another story was told about a Haida girl who used the plant, devils club, to cure her village during an influenza outbreak. This portion of the paper focused on the fact that these stories can serve as historical markers and can also help a researcher gain insight into the potentially curative aspects of some plants. Lipp described the use of what he calls "folk tales and mythology" (Lipp 1995:56) to highlight the biodynamic plants that are used in particular cultures and how these stories can be incorporated into research and help people understand the roles plants play within different groups.

What were helpful within this article were Lipp's suggestions on interpreting data and applying theoretical frameworks after completion of the data collection. This was an applicable mindset while gathering data for this research because of the need for reflexivity in anthropological research. Lipp's (1965) suggestion of waiting to impose a theoretical framework on the data gathered allowed for a degree of reflexivity without imposing personal opinions or interpretations onto the data.

In an article by David French (1965) on the ethnobotany of the Pacific Northwest he described the region as one of the most heterogeneous areas of North America in reference to

its topography and the diverse plant types that inhabit the area (French 1965: 378). Although this article was very general, primarily focusing on the Columbia-Frasier Plateau, he discussed the importance of agriculture in the more recent years within tribal communities and explained the types of food plants that were utilized within the area. French defined the geographic location and the environs associated within this portion of the Pacific Northwest. Indigenous people living within the interior parts of western Washington and Oregon west of the Cascades utilized resources similarly to the groups living east of the Cascades in the plateau region of Washington State. For these groups, fewer salmon and other fish were available than in the Northwest Coast area, and fish, game, and plant foods consumption was balanced (French 1965:378). This article was broken down into sections that encompassed different important food types that are utilized today and those that in the past played important roles in trade items with neighboring groups. Initially French discussed seed and nut harvests within the area and mentioned that hazelnuts were important aspects of trade with groups from the north within the northwest coast region (French 1965:379). Fruits and berries also were very important staples within the diets of people within the Pacific Northwest. Most notable is the Mountain Huckleberry (*Vaccinium membranaceum*) which grows in moderately high altitudes. These plants were so prized that indigenous groups removed trees with controlled burns to foster the growth of these shrubs and let in more sunlight (French 1965: 379). Of course these berries were only one of the species utilized by people within this area, and it is one of the most well-known plants within the region. Root crops, including camas, cimaryllid, lily bulbs, and corms were eaten when available in areas within western Washington when they were obtainable (French 1965: 381). This section in particular helped to illuminate the vast trade that was prevalent within the area prior to contact with Euro-

Americans and also supported the hypothesis that plants were used similarly on both sides of the Cascade mountain range in Washington State.

In the conclusion of this article French described how indigenous groups within the area have utilized the available plant species and pointed out the heterogeneity of the region. Some parts of the article failed to adequately describe how much indigenous cultures within these areas utilized a vast quantity of many different food sources. In fact, in certain parts of the article French (1965) described that groups used a relatively small percentage of food plants available to them, which seems to be contradictory to the information that was gathered throughout the research that was conducted for this research topic. Whether this description is true or false, this article seemed to have an overarching theme that was centralized around the idea that people within these areas depended on a wide variety of plants. Although the article lacked the idea of present tense, French did mention that many groups in the Pacific Northwest still have a strong connection to and understanding of the ecosystems they call home.

One of the last articles that helped develop the methodological and theoretical frameworks for this research was another article by Nancy Turner where she explained how long-standing and far-reaching the trade networks within British Columbia and neighboring areas were for culturally significant plants. Turner emphasized how important plant resources and products manufactured from plants were traditionally very important which continues today. Plant materials were not the only thing traded. Knowledge associated with these resources was also exchanged. According to Turner (1998), the exchange of materials and the knowledge associated with them has had extensive implications on cultural and ecological

existences that stretched far beyond simple subsistence (Turner 1998: 49). These trade networks were in existence both prior to contact and after contact with white settlers. Contrary to French's (1965) take on cultivation after European contact, Turner explained that some new plant resources were incorporated into indigenous trading schemes. She explained how the potato was distributed by indigenous peoples among themselves and was cultivated in many localities before Europeans appeared (Turner 1998: 59).

This article was very useful in the sense that it illuminated just how diverse and intricate the trade networks were in the past and served as a reminder that they continued post contact. It was also a great resource and provided information about how many groups within the area incorporated newly introduced plants into these complex networks. Illuminating the extra-cultural consequences in terms of effects on the ecology of the plants themselves and their abundance and distribution, this article presented a well-rounded explanation of how plants are incorporated into the lives of indigenous peoples (Turner 1998: 66). As this research continued it was important to remember the ideas that Turner had laid out in order to understand just how much of an integral role plants play in the lives of people within the area.

Reflexivity

Initially my interests within anthropology were rooted in archaeology. As an undergraduate I studied textiles from a local rock shelter on the Yakima River. As a senior at Central Washington University, I was diagnosed with stage 4 Non-Hodgkin's Lymphoma and was forced to take a year off of school as I underwent six rounds of chemotherapy. Admittedly as I enrolled in my classes for the following quarter after chemotherapy had ended, I was unsure of what I wanted to do with my academic career. I was no longer sure if I

truly wanted to pursue archaeology any longer. There was something missing that I could not figure out at the time. But I knew I wanted to continue in anthropology and pursue a master's degree within the field so I decided to apply to the University of Idaho that spring.

When I entered into the graduate program at the University of Idaho, I enrolled in a Plateau Indians class taught by Dr. Rodney Frey who was teaching in a way I had never experienced. Throughout the class I was inspired to work with still living people in their own communities and develop a new understanding of different cultures first-hand. I began thinking about possible topics that interested me. Given my recent stint of poor health I really wanted to develop a project that would focus on enhancing people's health. With the help of Dr. Frey I was able to develop a topic for my research that encompassed my love for plants, a topic that would allow me to see the results of my research first-hand and to have some sort of an impact, albeit small, on the health of the people involved. Cancer was a journey that cannot fully be explained in words…it changed everything in my life from my mindset, my goals, my aspirations, and my dreams. But if it were not for this sudden downturn in my health I would not have been given this experience or the wisdom to fully enjoy and appreciate the opportunities that have come forth as a result of it. It just goes to show that some of the biggest curves in one's life can lead to the biggest opportunities.

With a new outlook on life I began to see connections and themes in places that I had not thought of before. Things that I once took at face value have become topics that I think about more deeply. The more I began researching the plants for this project; I began to realize just how connected the plants are to the people using them and the health of the local ecosystems. Plants have the power to heal people. They may lack possess pharmacological

properties in some cases, but they are good for the soul. They can connect the people ingesting them with memories of the past, whether it is a fond memory of a dear aunt or grandmother or even an ancestor long since departed. Plants have a unique transitory component that parallels their nutritional value and in part makes them even more valuable in the health of many. Health and its sustainability has become an important and passionate interest of mine. If I am being honest, I never expected to gain these insights, but I am thankful to have been given the opportunity to learn about how interconnected we are to the foods we eat. The more I learn about the Muckleshoot tribe's revitalization efforts and their resiliency to retain traditional knowledge in the face of many destructive factors the more I began to see parallels in my own health journey. As a sovereign people, the Muckleshoot have withstood many challenges and continued to fight against the effects of colonization and urbanization to maintain aspects of their culture that are closely linked to cultural identity and community health. Throughout my journey in dealing with cancer I had to face many hardships. Maintaining my smile and fighting attitude through the process were difficult, but I knew it was something that I had to do. I had to fight against the effects of chemotherapy and maintain the sassy and happy attitude I had before. Three words have been commonplace in my mind as I researched this topic… resiliency, perseverance, and persistence. As I began compiling information through archival work and some observations for this research, the information that I found that anything worth having is worth fighting for.

CHAPTER 3: COAST SALISH HISTORY

Southern Coast Salish History

Southern Coast Salish refers to the speakers of two Coast Salish languages, Lushootseed (lə'shōōtsēd) and Twana ('twänə) (Suttles et al. 1990:485). Lushootseed is a language that is spoken by a number of different tribes in the area whose territories extended from Samish Bay southward to the head of Puget Sound and includes the fresh water drainages flowing into the sheltered salt water areas of the Puget Sound. Lushootseed consists of two groups and dialects, northern and southern (Suttles et al. 1990:485). Specifically, the Muckleshoot speak a sub-dialect of southern Lushootseed called Whulshootseed and Chinook Jargon.

Before the treaties of 1854 and 1855 and the implementation of reservations, over fifty named groups were found, and each had at least one or more winter villages, several summer camps, and resource sites (Suttles et al. 1990: 485). Neighboring groups were frequently linked by marriage ties, joint feasting and ceremonial activities, and the same use of resource areas. Neighboring groups that shared the same waterways and drainages had especially strong ties much like the Duwamish and Upper Puyallup bands that were eventually merged onto the Muckleshoot reservation after the treaties were signed. Social networks throughout the region were fluid; many groups remained in contact with many different people throughout the region. There was not an area or group within the region that was not a part of this complex and integral system that connected the Southern Coast Salish region to the rest of the state.

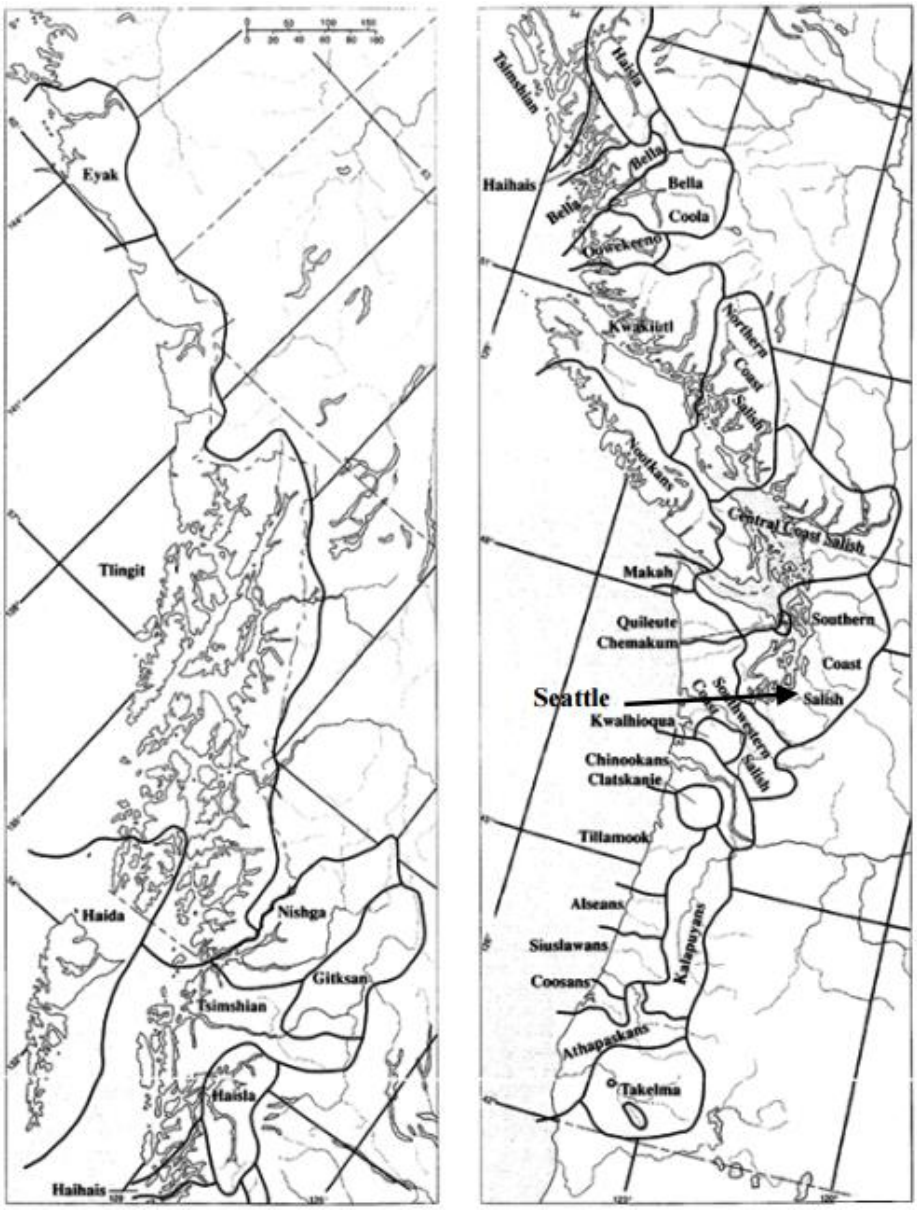

Figure 7: Location of Southern Coast Salish in Relation to Seattle, WA (Footen 2010)

The marital, economic, and ceremonial ties that linked groups within the Southern Coast Salish region extended into other regions. Contact between inland groups was by well-known systems of trails (Suttles et al. 1990:488). The Cascade Range was not a barrier; the Snoqualmie and upriver people in the Puyallup and Nisqually drainages had considerable contact with the Sahaptin-speaking Kittitas and Yakama. In the middle of the nineteenth

century, there were perhaps as many speakers of Sahaptin as Lushootseed in some villages in the upper Puyallup and Nisqually valleys (Suttles et al. 1990: 488).

Except for casual observations by members of the George Vancouver expedition of 1791, information on this region prior to the entry of the Hudson's Bay Company in the 1820's is unavailable and systematically gathered data before the 1850's is absent (Suttles et al. 1990:488). Many early accounts of groups within this area of Puget Sound are descriptions of native cultures in the second quarter of the nineteenth century. Thankfully, many groups within the region have worked tirelessly to maintain their traditions and the teachings associated with them. In addition, many outside researchers have also documented numerous aspects of the traditional lifeways that are now available for others to use and access.

Southern Coast Salish people depended on a greater extent of vegetable foods and land game than peoples to the north and on the outer coast; nevertheless, fish and especially salmon were a staple in the diets of many living in the area. All five species of salmon and steelhead spawned somewhere in the region. Pink salmon were less common and sockeye were limited to small runs in the Skagit and Duwamish river systems. Fishing weirs were used in upstream portions of river systems. Downstream, men on platforms would use fishing nets to lift fish out of the water. In saltwater, herring and smelt were caught with herring rakes used from canoes. Flounder were also caught by wading in the water at low tide (Suttles et al. 1990:489).

The most important land animals that were harvested were elk and black tail deer. Much of the meat was dried and stored for winter use. Around twenty species of waterfowl

were also caught and consumed. Ducks were caught in a variety of different ways including catching ducks in long nets raised between pairs of high poles, in nets anchored underwater over places where herring were spawning, and in snares (Suttles et al. 1990:489). Shellfish and mollusks were also very important food sources. Some species, including cockles, butter clams, and horse clams, were dried and stored for use during the winter. Dungeness and red crabs were also eaten frequently along with sea urchins.

Vegetable foods, including sprouts, roots, bulbs, berries, and nuts were part of the Coast Salish diet. The most important roots and bulbs were bracken fern, camas, and especially in the Duwamish area, wapato. Important berries included salmonberry, thimbleberry, trailing blackberry, serviceberry, salal berry, huckleberry, blueberry, and red and blue elderberries. Some berries were harvested using comb-like devices unique to this area (Suttles et al. 1990:489).

Men were principally involved in woodworking, and the principal tools were spool-shaped stone mauls, wedges of elk antler and yew wood, and adzes of a distinctive regional type having a handle with a flared end (Suttles et al. 1990). These woodworking skills were also used when constructing plank houses and several household utensils. Women worked primarily with cedar bark and made most of the cordage, mats, baskets, and blankets. Women also made twine from nettle fiber and Indian hemp that was traded from east of the Cascades. Men made heavier cordage of bear gut and rope of twisted cedar withes (Suttles et al. 1990).

Three types of plank houses were built within the region: shed-roof houses, gambrel-roof houses, and gable-roof houses. Shed-roof houses were probably the most common types of houses in the area. The gambrel-roof house was unique to the Puget Sound and had a roof

form somewhat like a truncated pyramid. Finally, the gable-roofed houses may have been the most common at the southern end of the region. In all of these houses, the insides were open without partitions between the sections. The house posts were sometimes carved or painted. Housing differed by season and in the summer camps, where temporary structures were made; a gable-roof structure was favored and made of a frame of poles covered in housemats.

Basic residential groupings were the village, the household, and the family. Villages usually consisted of one or more big plank houses and perhaps one or more smaller structures (Suttles et al. 1990). In the Duwamish area, a couple often lived with the wife's parents until the birth of their first child, if not longer. Generally, one family head was the acknowledged head of the household. Among the Twana and other southern Puget Sound tribes, village membership was permanent. But among the Duwamish and Upper Skagit, people moved freely from one village to another (Suttles et al. 1990:493). Villages were almost always linked in several ways through marriages among its leading families and consequent ties of kinship and through common participation in a number of ceremonial activities. Kinship was determined bilaterally and there were no lineage-like kin groups. Lushootseed and Twana kinship terms are like those of other Coast Salish languages in making no distinctions between relatives on father's and mother's sides (Suttles et al. 1990).

Feasting and gift-giving were required to validate and publicize events in the lives of members of upper-class families, such as taking or giving a name and announcing a daughter's puberty (Suttles et al. 1990). The family invited others in the village to feast followed by distributions of gifts of food and wealth. These ceremonies were performed primarily for the benefit of one person, with his or her family gaining indirectly in recognition

(Suttles et al. 1990). Many other ceremonies were performed that a large numbers of people benefited from directly. These beneficial ceremonies included events like the winter dance, the soul-recovery ceremony, the potlatch, and the secret society. Winter dances were sponsored by people who had recently been diagnosed with an illness. Soul-recovery dances were performed by several men used their spiritual powers to recover lost souls. Potlatches were usually held in early fall or summer, when food was plentiful. They were sponsored by one person or several who had wealth and power. Villagers from around the area were invited and expected to bring food and gifts.

Muckleshoot Tribal History

The Muckleshoot Indian Tribe is a federally recognized native tribe whose members include descendants of the Duwamish and Upper Puyallup people. Their ancestors have inhabited the central Puget Sound for thousands of years. In 1857, the Muckleshoot reservation was established and given the name derived from the native name for the prairie where the reservation sits today. Ancestors of the Muckleshoot tribe depended on fish, animals, and plant resources and had complex and wide reaching seasonal rounds, which they completed yearly in search of these resources. Each seasonal change brought different movement patterns. In the winter, when travel was difficult, they lived in villages along the region's waterways relying on caches of food and local resources. In the summer months, they moved to summer camps and resource gathering areas. Within these summer camps, tribal members joined with families from other winter villages and participated in fishing, clamming, hunting, gathering, and other pursuits.

Villages were linked by ties of marriages, joint feasting, ceremonies, commerce, and use of common territory. Their network of kinship extended across watersheds and east of the Cascade Crest. These family ties gave the Muckleshoot extended access to resources outside of the Duwamish watershed and into areas down river with the Suquamish and other groups along Puget Sound. They also had access to the upper reaches of the drainages and areas used by groups east of the Cascade Mountains through intermarriage.

In the years of 1854 and 1855, Territorial Governor Isaac Stevens negotiated treaties with various native groups of the Puget Sound. Stevens journeyed to Mukilteo where he negotiated the Treaty of Point Elliot with the Duwamish, Suquamish, Snohomish, Snoqualmie, Lummi, Swinomish, and other tribal groups occupying the area between the White River and the Canadian border. In the Treaty of Point Elliot, all of the native people of the Lake Washington and Duwamish River watersheds were grouped together as Duwamish. Chief Seattle's mother, a White River tribal member descending from the Duwamish bands ancestral to the Muckleshoot Tribe and whose father was Suquamish, signed the Treaty for the Duwamish and Suquamish Tribes. In these treaties, native people of Western Washington ceded their territory in exchange for the United States' promise that they would retain small reservation homelands and would be free to continue to fish, hunt, and gather the resources they needed off of the reservation. Following negotiations of these treaties, in the fall of 1855, hostilities began between native people and white settlers on both sides of the Cascades. Muckleshoot ancestors from villages on the upper portions of the Duwamish watershed and the Upper Puyallup participated in the conflict. Other Muckleshoot ancestors from villages located in the lower parts of the Duwamish and White River watersheds were interned during the hostilities.

By the summer of 1856, the conflict in Western Washington had subsided and Governor Stevens held a meeting at Fox Island with representatives of the Nisqually, Puyallup, White and Green River Indians. At this meeting, Stevens agreed to changes in the Puyallup and Nisqually reservations and to the establishment of an additional reservation at Muckleshoot where there was a military fort on the prairie of that name. In 1865, the city of Seattle was incorporated. Concurrently the new town enacted a law that prohibited permanent residences of indigenous groups or any permanent native structures in the city limit forcing thousands of Salish, including Chief Seattle, off their ancestral lands and out of their homes. By the end of the first decade of the twentieth century, every longhouse, potlatch house and trace of the Salish communities that had inhabited the Seattle area since time immemorial had been burned and eradicated (Footen 2010: 5). Many of the indigenous groups who were removed from Seattle city limits were relegated to tents on nearby beaches (Figure 3.2).

Figure 8: Relegated to tents on the beach a Salish woman weaving a basket on a Seattle beach ca. 1900; Seattle in the background (Footen 2010:6).

Official records clearly outlined the lands that would be included in the Muckleshoot reservation and native people made sure that the reservation would preserve an important village site and fisheries on both the White and Green rivers. However, the documents leading to the Executive Order of January 20, 1857 refer only to the Muckleshoot prairie and the military station whose buildings would be turned over to the Indian department (History of the Muckleshoot Indian Tribe and Its Reservation). Between 1859 and 1868 the tribe tried to rectify this error and include all of the land between the White and Green rivers in the Muckleshoot reservation. In February 1868 the Secretary of the Interior recommended that President Andrew Johnson sign an Executive Order including all of the land in Townships 20 and 21 between the White and Green Rivers in the Muckleshoot Reservations. Unfortunately, the Executive order arrived during the chaotic time of President Johnson's impeachment and

was neither approved nor disapproved. By the early 1870's, when the expansion of the Muckleshoot Reservation was taken up again, railroad grants had been made of all of the odd numbered land sections in the vicinity of the reservation. Thus, when the Muckleshoot Reservation was finally enlarged by Executive Order in 1874, the enlargement only included land in five even numbered land sections extending diagonally along the White River. In the years that followed, the establishment of the Muckleshoot Reservation, as pressure from white settlers increased, native people moved from their traditional villages and relocated on and around the Muckleshoot Reservation. As time passed these Duwamish and Upper Puyallup tribes began identifying as the Muckleshoot Tribe rather than by their historic tribal affiliations as members of various Duwamish or Upper Puyallup bands. In 1936, the tribe formally reorganized their government and adopted a constitution approved by the Secretary of the Interior under the Indian Reorganization Act.

Prior to settlement the area of the Green River watershed was over 1,575 square miles and included the White River, the Black River, Cedar River, Lake Washington, Lake Sammamish and the Sammamish River (Footen 2010:12). This watershed fed many different tributaries to these major bodies of water which made up over 1,900 miles of streams accessible to fish for many indigenous people. Prior to the alterations by settlers the White River flowed northward into the present day Green River. The Sammamish River, Lake Sammamish, Lake Washington, and the Cedar River all flowed into the Black River which converged with the lower Green River which is called the Duwamish (Footen 2010:12). This diverse ecosystem created a dynamic watershed environment that supported incredibly diverse amounts of flora and fauna (Collins, 2005). This large watershed housed large estuarine and wetland complexes that made farming difficult for incoming Euro-American

settlers. Major flooding and a lack of significant waterfront severely limited farming and commerce in Seattle within the Puget Sound region. At the turn of the century people began to stem the flooding and fill in tidal lands; as a result, the archaic watershed would be reduced by 30% and streams accessible to fish reduced by 7% (Footen 2010:12). In 1895 prior to the inset of filling tidal flats approximately 175 hectares of estuarine wetlands existed in what is now the greater Port of Seattle (King County, 2005). By 1916 the landscape of the Green River Watershed had been permanently altered by the needs and desires of an industrial culture (Footen 2010). The Green River, once home to an annual return of some 40,000 Chinook salmon, was struggling to produce fish by 1920 (Footen 2010).

Prior to the arrival of the settlers, Coast Salish people inhabited the shores of Lake Washington and were known separately from the Puget Salish as hachua'bsh, or "the lake people" (Footen 2010:13). The first recorded history of the lake and its indigenous residents noted at least eighteen longhouses along the shores of the lake. Until 1916, the outlet was at the southern end of the lake, where the sluggish Black River exited through marshy lowlands (Figure 9).

Flowing into the Black River was the Cedar River which originated from snowmelt in the foothills of the Cascades. The combination of these rivers entered the Lower Green River and Duwamish estuary on the eastern side at the eighth mile of the river near what is now the city of Tukwila, Washington (Footen 2010). Upriver approximately two miles a larger glacier river originating on Mt. Rainer known as the White River entered the Duwamish, bringing with it large amounts of sediment and wood (2010). Fed by these large tributaries, the

Duwamish formed a north flowing and meandering course through a countless tideflat channels that emptied into Elliot Bay.

As the land around Seattle's waterfront became increasingly more expensive lumber mills relocated to Lake Union and the Ballard area, an independent community north of Seattle city limits. Tidal conditions forced vessels caring lumber to anchor near the mouth of Salmon Bay in the Puget Sound along the shores of Northwestern Ballard and take aboard their cargoes from barges. The mills on Lake Union sent their production over rail line to Elliot Bay for loading upon lumber schooners (Footer 2010). As urban industries and farming increased within the area there was increased interest in expanding trade by creating access to Puget Sound. Mills, mines, and timber camps lining the shores of the lake along with other commercial developments greatly increased interest in building a canal that would connect Lake Washington to Puget Sound (Klingle, 2007). In 1916, the Lake Washington Ship Canal was completed, the lake was lowered and settlers along the shores of Lake Washington could see hachua'bsh in their canoes fishing. The construction of the Ship Canal lowered the lake surface by 7% and created a vegetation free ring around the lake. Consequently, the marshes dried out and were overgrown by willow leaving

Figure 9: Black River 1905 (Footen 2010)

the large number of waterfowl without any habitat (Footen 2010). Fish populations were disrupted as well. When the Ship Canal opened Lake Washington was lowered by 9 feet. Since the Black River the lake's outlet at the time only averaged 3 feet in depth, it was completely dried up (Bagley, 1929). An account of the river was relayed by a Duwamish native Joseph Moses, who stated in an interview with David Buerge,

> That was quite a day for the white people at least. The waters just went down, down, until our landing and canoes stood dry and there was no Black River at all. There were pools, of course, and the struggling fish trapped in them. People came from miles around, laughing and hollering and stuffing fish into gunny sacks (Footen 2010:15).

Until 1912, the Cedar River emptied into the Black River. In 1911, however, the Cedar River flooded the city of Renton. The following year the town dug a 2000-foot-lomg, 80-foot-wide canal to reroute the course of the Cedar to the north so that it flowed directly into Lake Washington in hope of avoiding floods in the future (Footen 2010: 15). These landscape alterations completely disrupted the migration patterns of adult and juvenile salmon. These fish that had once exited and entered Lake Washington through the Duwamish and Black river systems now had to find a new migration pathway that took those fish twelve miles north along the lakeshore and five miles west to the Ballard Locks (Footen 2010). It is not known whether or not Lake Washington salmon juveniles and adults ever found this new migration pathway (Footen 2010).

Unfortunately, the salmon and their migratory pathways were not the only things affected by the construction of the Lake Washington Ship Canal and the subsequent termination of the Black River. Many indigenous groups within the region were also affected

by the loss of critical salmon runs and important links of intermarriage for groups throughout the region with the Black River indigenous bands. What made intermarriage so appealing for groups within the area were the rich salmon runs that entered the Black River before any other river within the area. These were important runs and inter-tribal connections because by this time of the season many groups were beginning to reach the end of their winter food caches and nearing famine. The early salmon runs aided in many people's well-being and also strengthened the bonds between many tribal groups throughout the region (personal correspondence with Valerie Segrest).

In the latter half of the Nineteenth Century, the United States set forth a policy that sought to breakup tribal communal land holdings by allotting reservation lands to individual native families and selling "surplus" lands that remained to non-natives. These land-breaking policies were first instituted on the Muckleshoot reservation in the early 1900s.When these policies were enacted almost all of the Muckleshoot Reservation was divided into allotments that were assigned to native families. Subsequently, in the years that followed, tribal members would suffer from grinding poverty, discrimination and substandard housing and were often forced to sell their reservation land holdings in order to survive. During this time period, the State of Washington also increasingly sought to restrict off-reservation fishing, hunting, and gathering activities upon which tribal members depended for their sustenance and livelihood.

In spite of these obstacles and a lack of resources, the Muckleshoot Tribe persevered. The tribe maintained a cohesive community and government structure, preserved its culture, and built its own community hall. In the 1960s, the Muckleshoot Tribe, together with the Puyallup and Nisqually Tribes, repeatedly challenged state efforts to prohibit native fishing at

traditional fishing locations. In 1970, these actions led the United States to file a lawsuit against the State of Washington to definitively determine the nature of the fishing rights reserved in the treaties concluded by Governor Stevens in the 1850s. The decision in that case, United States v. Washington, was rendered in 1974 and subsequently upheld by the United States Supreme Court. The decision held that tribes mentioned in the Stevens Treaties are entitled to 50% of the fish available for harvest from traditional tribal fishing locations, and free from most non-tribal state regulations. The Supreme Court also affirmed the United States' recognition of the Muckleshoot Tribe as the political successor to multiple former Duwamish and Upper Puyallup Tribal bands from the Treaty of Point Elliot and the Treaty of Medicine Creek. Thus, the court found the Muckleshoot Tribe to uniquely possess rights under both the Treaty of Point Elliott and Treaty of Medicine Creek.

CHAPTER 4: PLANT USES

Plant Biology

Blue camas (*Camassia quamash*) is a perennial herb belonging to the lily Family (*Liliaceae*). Its large bulbs are egg shaped with a brown coat and are similar in size to that of a Daffodil. It grows up to 60 cm tall on long slender stalks with basal leaves, which grow from its edible bulb (Harris 2003:512). Terminally arranged flowers adorn the tops of camas on a leafless peduncle. These flowers can range from deep blue to light blue and purple hues and stand conspicuously above the meadow flora where it frequently grows (Harris 2003:512). The flowers themselves are 2 to 5 cm in diameter arranged in a simple raceme and boast a 3-cleft style at the apex (Kirk 1970:214). Camas' flowers can be described as star-shaped and having yellow anthers (the pollen-bearing part) (Tilford 1997:20). Sepals and petals on the flower spread unequally from the center, one petal turned downward, and the other five are erect and horizontal. Each of these petals and sepals wither and fall separately after flowering is completed (Gilkey and Dennis 2001:70). Camas can bloom from April to June, but the timing of these blooms can change based on the climate, elevation and snow pack within the area where grows. Regionally, camas is located from British Columbia, south into northern California and east into the mountains of Montana, Wyoming, and northern Utah (Tilford 1997:20). Camas has a very diverse habitat; it can grow in a number of different areas such as grassy meadows, bluffs, and often grows in moist or swampy fields. It is also a hardy plant that is highly adaptable and propagates in many places with great ease. In forested areas, once a large enough space is made in the canopy and ample sunlight is available, camas moves in to the patches where the sunshine is present (Harris 2003:512). Camas flourishes when it

grows in areas that remain moist for a large part of the year but dry out by late summer. Camas thrives at low to mid-elevations in the mountains.

Chocolate lily is a perennial forb that belongs to the lily family (Liliaceae). It grows 20- to 60- cm tall and its lance-shaped linear leaves gather in groups of 5-9 down the unbranched stem. The flowers of the chocolate lily are bowl-shaped mottled flowers that are up to an inch and a half wide and have purple, yellow, or green mottling on the six tepals (Fagan 2006:130). Flowers hang downward, and the tepals flare open. The bulbs of this plant consist of several fleshy scales which disintegrate into numerous rice-like bulblets. These bulbets have earned the chocolate lily the nicknames: Wild Rice, Indian Rice, and Northern Rice Root. Common names for chocolate lily also include Mission bells, Checker lily, and Kamchatka lily. The bulbs tend to grow shallowly in the ground (5 to 20 cm) and are in close proximity to other bulbs (Joseph 2012:27). This plant grows in a diverse number of different ecosystems. It makes its home in moist tide flats, meadows, open forests, rocky beaches, and stream banks in the lowland to subalpine zones. It commonly propagates most effectively in shaded clearings and shady moist roadsides (Gilkey and Dennis 2001: 72). This species extends around the rim of the North Pacific, from Japan and the Kamchatka Peninsula in Russia to the coast of Alaska and British Columbia, and as far south as parts of western Washington and Oregon (Figure 10)(Joseph 2012:24).

Figure 10: Distribution of Chocolate lily in North America (Joseph 2012:25)

Balsamroot (*Balsamorhiza deltoidea*) is a perennial plant that grows from a large taproot, and this plant begins to bloom in the late spring and early summer. The plant itself grows 15 cm to 61 cm tall, and its width is usually similar to its height or larger. It has triangular leaves that are smooth around the margins and lack the hairy undersides like that of its eastern counterpart (*B. sagittata*). The leaves of this plant range in size from 10 to 50 cm long and 10 to 20 cm wide. Its flowers are large and yellow with a sunflower-like, ray or disk shaped head. The flowers also have slightly hairy involucres. Involucrals bracts on this plant are lanceolata to oblong-lanceolate in shape. The lengths of these involucrals are 1 to 4 cm long, herbaceous and exceed the lengths of the inner involucrals. These flowers are borne stout flowering stalks, and the flowers are 5 to 10 cm in diameter. The word *Balsamorhiza* refers to the balsam like aroma of the plants roots. This plant is similar to *B. sagittata*, but

differs in being less densely pubescent, with the herbage and involucre being green rather than grayish. The fruits of this plant are called "*Achenes glabrous*". These seeds are usually 7 to 8 mm long and lack a pappus. This native plant occurs on both sides of the Cascades crest in Washington, British Columbia, and south to California. It thrives in prairies and other open areas and in partial shade at low level elevations, mostly in the Puget Sound trough.

Ecological Concerns

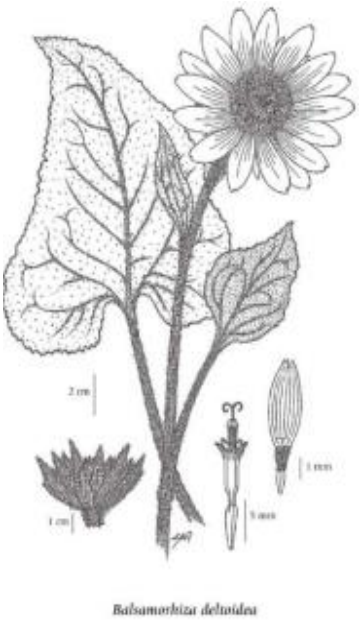

Figure 11: Illustration of *Balsamorhiza deltoidea* (Burke Museum Herbarium)

The Puget Sound ecosystem is also referred to as the Salish Sea ecosystem, which straddles the United States and Canadian border and includes approximately 18,000 km^2 of water and 110,000 km^2 of land area (Quinn 2011:1). The Salish Sea ecosystem is a fjord with flooded glacial valleys and is classified as a large estuary, fed by highly seasonal freshwater from surrounding basins (Figure 4.3). The largest inputs of freshwater come from the Fraser River which drains a large part of British Columbia, Canada. Other important sources of fresh water are the Cedar, Duwamish/Green, Powell, Campbell, Elwha, Nisqually, Nooksack, Puyallup, and Skagit Rivers.

Figure 12: The Salish Sea Ecosystem (Quinn 2011:2)

This area is the nation's second largest estuarine ecosystem. This vast area supports more than 200 species of fish, 100 species of marine birds, and 26 kinds of marine mammals in addition to a population of 4.4 million people. The Puget Sound is under severe pressure due to the culmination of many problems in the region. These pressures include population growth, urbanization that increases the amount of hard surfaces covering the land, loss of wildlife habitat, pressure on water supplies, as well as water and air pollution, among others. Washington State's Office of Financial Management estimates that by 2020, 5.1 million people will live or work in the region - an increase in population of about 700,000. This increase is the equivalent of adding about three more cities the size of Tacoma in the next decade. Critical questions about the future of the Salish Sea and the Sound are looming in the present and the future (Washington State Department of Ecology 2010).

Currently many factors are hindering the health of this ecosystem. Washington state ecologists working with the Department of Ecology currently estimate that the Puget Sound receives millions of pounds of toxic chemicals every year from surface runoff, groundwater

discharges, and municipal and wastewater outfall pipes. These contaminants include oil and grease, PCBs (polychlorinated biphenyls), and phthalates as well as toxic heavy metals, such as copper, lead, and zinc. These toxins concentrate in urban bays and enter the food chain. Polluted storm water is another major contributor of these contaminants that enter the Puget Sound. This storm water comes from highways, roads, driveways, roofs, parking lots, disturbed soils, and other developed surfaces. In 2008, 549 streams, rivers and lakes in the Puget Sound basin were impaired by poor water quality. Incidentally, many of these polluted waterways receive a large quantity of contaminated storm runoff from neighboring roads and other developed surfaces. Water quality is a major issue within the Sound since several dead zones are now present. In these zones, pollution continues to rob the water of oxygen making it inhospitable for living things (Krohn 2010:9).

Unfortunately, more than water quality is suffering in the Puget Sound. Transient and permanent populations of orca whales in southern Puget Sound are considered to be among the most PCB-contaminated mammals on earth. Puget Sound harbor seals are seven times more contaminated with these toxic chemicals than those living in Canada's Strait of Georgia, which adjoins the Sound to the north. Losses of habitat and shoreline development are also critical impairments to the health of this ecosystem. In the past 125 years, about 70 percent of critical habitat such as salt marshes, eelgrass beds and estuaries have been damaged by or completely lost to development. To make matters worse more than 30 percent of the Sound's 2,500 miles of shoreline are now reinforced by artificial bulkheads, seawalls, and other structures. These structures can starve beaches of sediment and destroy shoreline vegetation. They also have negative effects on juvenile salmon populations by eliminating cover and food sources.

Toxins in the environment have diminished all traditional food sources. Many indigenous groups within the Puget Sound have identified environmental toxins as one of the most powerful barriers to accessing traditional foods. Traditional shellfish beaches often have unsafe levels of heavy metals (Krohn 2010:8). Fish that were once important staples like Chinook salmon and rockfish now have high levels of mercury and PCBs, which can cause learning and behavioral problems in children. Research shows that fish and shellfish populations are now a fraction of what they were just two decades ago. These low numbers are in part due to the environmental toxins that are present within the area. Concerns over mercury and other heavy metal toxins are in the minds of many people who still harvest the shellfish and fish within the area, but many believe that the benefits of eating them outweigh the risks.

The Environmental Protection Agency has worked in partnership with many tribes in the area to clean up the toxic sites, but much more still needs to be done in order to clean up old sites and prevent new ones from forming. These types of cleanup projects are very expensive and can be controversial. Controversy can arise because environmental toxins may be quickly released into the water during the cleanup process instead of being slowly released over many years (Krohn 2010:9).

Toxins are also a huge concern when harvesting wild plants. Berry fields may be sprayed with pesticides if they are near clear-cut areas (Krohn 2010). Insecticides and herbicides are also commonly sprayed in public areas, such as fields and along roadsides. Wild foods may also grow in industrial areas or dumpsites and the soils in these areas can carry toxic compounds that are then absorbed into the plants themselves (Krohn 2010). Many

tribal members have difficulty finding out if harvest areas are safe and the information may be unavailable without costly environmental testing. Environmental toxins are one of the largest barriers and hurdles that must be cleared and identified in order to restore the health of the environment and the people who depend on it.

Areas where traditional food plants once flourished are continuously disappearing. Unfortunately, the disappearance of traditional food plants has been an increasing trend throughout the years beginning with the signing of treaties back in the late 1800's. Areas where people had harvested food plants, such as camas years prior have disappeared or fallen victim to urban development. Non-native species have also begun to inundate the area, replacing native plants and threatening traditional food sources. Scotch broom (*Cytisus scoparius*) is an invasive shrub that has taken over many prairies where camas, bracken fern, edible lilies, strawberries, and other wild foods grow (Krohn 2010:14). Milfoil (*Myriophyllum*), an aquatic plant originating in Australia has taken over many local lakes. The emergence of spartina grass (*Spartina alterniflora*) has begun to replace native eelgrass in the Puget Sound shallows and along the Pacific coastline, and is a threat to native crab and fish species (Krohn 2010:14). The Cowlitz Natural Resource agency describes how non-native carp species introduced into the Columbia River have consumed large amounts of native wapato, an important edible root within the area (Krohn 2010). There are many other examples of how non-native and exotic animal and plant species continue to effect traditional and native food plants in the area.

Most people can identify with the idea of having limited time and money. Many times personal lives, responsibilities and busy work schedules can hinder the activities we enjoy in

our free time. Many people within tribal communities have difficulty getting enough free time or money to hunt, gather or grow their own foods, and purchasing native foods, such as wild fish and berries can be very expensive. Some traditional areas from which food can be gathered are also far away and require ferry rides to get to. One example of this comes from the Muckleshoot community. Muckleshoot has clam beds on Vashon Island that are available for tribal members to harvest (Krohn 2010:15). While this is a great resource, many people are unable to afford the forty-dollar ferry toll and at times cannot free up enough personal time to make the trip. The absence of people who can tend to these resources has had negative effects on the clam beds themselves. Because the beds are not being harvested, the clams are growing too close together and are dying off (Krohn 2010). These clam beds are an excellent example of a setting that would benefit immensely from traditional harvesting techniques that could help the beds become healthier.

Food as Culture

"Food is a blessing, gratefully and respectfully gathered and prepared, given and received with just as much gratification and respect."- Coast Salish core value of food

Food can be described as a lens into the "whole cultural package" (Dusselier 2009:334). Traditional meals and food staples can reveal a number of aspects about people's social relations and can serve to connect the past with the present and concerns about future possibilities. Food is also a rare unifier; it directly connects to memory and identities of the people eating their traditional foods. Gathering and eating traditional foods can ignite the imaginations of the youth enjoying the food and can inspire them to explore more of their

heritage and participate in a common all-encompassing aspect of their heritage that has been passed on throughout many generations.

Many scholars and researchers in some fields have developed meanings based on food identities. Psychology focuses on psychological meanings in identity while scholars in the humanities focus on cultural and collective meanings of food (Dusselier 2009:334). In everyday lived experiences however, these two identities work together. Identity formation is a continuous process of developing understanding about one's self and then connecting those insights to larger groups of people. Researching food and how it contributes to life experiences, memory, collective histories, and identity formation is an important aspect of understanding the cultural identity of any group of people (Dusselier 2009:335).

Indigenous communities throughout the Pacific Northwest have historically depended on a wide variety of food species. These traditional food sources have sustained and promoted health in native communities for countless generations. Food formed the backbone for many indigenous groups by virtue of their religious, cultural, economic, and medicinal importance, in addition to their role in feeding people (University of Oregon n.d.). The relationship between plants and people within these communities is reciprocal. These plants provided cultural and physical health and in return people brought the plants health and propagation.

Almost every tribal community in Western Washington has stories of relatives who lived to be over 100 years old. Often these relatives are remembered for gathering and growing their own food (Krohn 2010:1). These traditional gathering and gardening practices have been passed down for countless generations. These traditions and lifeways both sustained people and created a rich culture (Krohn 2010). Food was a living part of culture

and served as a direct link to the land. Core cultural values were also associated with food. They aimed at making food a center of their culture, honored the food chain, ate with the seasons, and incorporated a wide variety of foods into their diets. Gathering food and sharing it with family and community was woven into everyday life (Krohn 2010).

Connecting food and identity are central to studying traditional foodways in indigenous cultures. Foodways offer a path to cultural preservation and community health. These foodways can also serve as a space where people can position themselves within their own heritage and environment. They can also provide a means of cultural understanding to outside groups and entities because food is a common unifier that everyone can relate to.

Plant Use Prior to Contact and Colonialization

Prior to contact with Euro-Americans, indigenous groups within the Coast Salish area accessed an abundant and diverse spread of flora and fauna, which they utilized to create a well-balanced and healthy diet. Many groups consumed large amounts of animal proteins, but vegetable foods like edible rhizomes, corms, fruits, berries, wild greens, and tubers were also an essential component to maintain their healthy diets. Plants that provided green shoots and greens were particularly important during the spring after many diets were composed of dried fish and oil in the winter months (Suttles et al: 28). Plant foods provided sustainable aspects to the diet of Coast Salish peoples. Plant products were multifaceted items that served a variety of different purposes. They provided dietary diversity, essential vitamins, minerals, carbohydrates, and dietary fiber. Plant foods also carried strong socioeconomic components for plant propagation and management because plants were valued items of trade and exchange, thus serving, practically and symbolically, as wealth (Deur 2005:334). Ceremonial

and religious motives were also associated with certain plants that were nurtured carefully and ceremoniously. The attribution of a "spirit" within all of nature's creations, and of the powers of plants to affect human lives and human well-being, is another reflection of, and reason for, peoples' stewardship of the plants they depend upon (Deur 2005:334-335). One example of this comes from British Columbia. Certain indigenous groups in the area will avoid girdling red-cedar (*Thuja plicata*) trees when harvesting their bark because the tree is conceived of as a sentient being with a spirit and it would die and nearby trees would curse the perpetrator of this act (Deur 2005:335).

Seasonal Rounds

Eating with the seasons has been a foundational teaching within the Coast Salish area and within the Muckleshoot community since time immemorial. Many people believed (and still do) that harvesting a variety of foods seasonally ensures an abundant amount of food will always be available throughout the year. Eating seasonal foods is believed to prepare people and their bodies for the change of seasons. The moon and its lunar cycle were key portions of the northwest calendar. Each lunar cycle from new moon to new moon represent a lunar month. Each moon is named for its relationship to the seasonal rounds of daily life in the village. For the Coast Salish these include the summer Berry Moons, the Elk Calling Moon, the Digging Moon, and the Silver Salmon Moon (Bohan 2009:37). Each group named their moons in accordance with their seasonal round calendar. The first song of the Pacific chorus frog means that warming time has begun, and the new shoots will soon be ready to harvest, beginning a new year of seasonal rounds of food gathering. People within the area used seasonal indicators, such as when certain birds or animals sing or make noise or when flowers

bloom or grow to a certain height to determine when key resources are ready to be harvested (Bohan 2009:37).

Indigenous groups within the Pacific Northwest traditionally participated in seasonal rounds to take advantage of resources that were available in their home territories at certain times of the year. Temporary shelters housed the traveling families while they gathered items that would be relied on throughout the year to survive (Krohn 2007:6). These seasonal movements took advantage of culturally significant plants growing in different habitats and locations that were available at specific times in the year. The plants and resources acquired at these gathering sites were regulated by traditional patterns of ownership and control. Certain habitats, such as prairies and open meadows containing camas bulbs (*C. quamash, Camassia spp, C. leichtlinii*), estuaries and tidal flats, spring bank clover, rice-root (*Fritillaria camschatcensis*) and Nootka lupine, were especially prized and cared for, while other habitats were frequented for secondary or backup resources in times of scarcity (Deur 2005:153-154). These plants still play an important role in the lives of contemporary groups living within the region and elsewhere.

Roots of Traditional Knowledge and Land Stewardship

Traditional knowledge and stewardship of the land were infused with practices and concepts that were passed down through teaching, learning, and social construct. The origins of these practices and the knowledge associated with them are frequently obscured in ancient history and embodied in metaphysical teachings (Turner 2014:159). According to Turner, a number of different plant- and animal- resource management techniques were originally learned by observing other animals and their effects on the growth and productivity of plants

(2014:159). Ethnographic accounts by the Kotzebue of Alaska show that grizzly bears harvest Indian potato (*Hedysarum alpinum*) in a similar fashion to the people gathering the roots from their community. The bears typically only harvest the largest roots and some are even torn off leaving smaller plants undisturbed for the seasons to follow (Turner 2014). Camas, chocolate lily and other roots within the same family can withstand digging, overturning of the soil, consumption, transport, and caching of underground storage organs by burrowing rodents and by geese, swans, grizzly bears, and other wildlife. Many plants are adapted to withstand and rejuvenate themselves after moderate amounts of trauma caused by people, animals, or natural disturbances.

Episodes of natural disturbances- floods, ice jams, storms, exceptionally high tides and tsunamis, windthrow trees, fire, and even lava flows- also provided opportunities for observing the regenerative capacity of plants and were probably sources of "learning through limitation" in the development of management at the habitat level (Turner 2014:161). Lessons that arose from these catastrophic events or other forms of inappropriate treatment of resources and habitats may have also contributed to the development of management systems. Additionally, other forms of inter-tribal communication probably aided the development of different techniques that assisted in the propagation of important food plants and other materials that were vital to the groups within the area. Stories passed from group to group or generation to generation also would have served as a means to spread certain important lessons so that the same mistakes would be avoided. Turner (2014) provides an account from an elder from the Lil'wat (Stl'atl'imx) tribe who explained how Grizzly Bears may have informed his people about a practice that led to the intensification of the Yellow glacier lily (*Erythronium grandiflorum*) in subalpine parklands. Grizzly bears frequently would dig and

scratch at the plant to uproot it but they would not eat it right away. They would leave it in the sun to let it dry out a bit. This method of harvesting was adopted by people within the area. They would typically leave the lily bulbs to wilt where they were dug, which allowed them to partially dry out before cooking them.

Similar scenarios could be argued for the intensification and cultivation of chocolate lily. In the estuary gardens and tidal marshes of central and northern areas within the Northwest Coast, a three-way symbiosis existed between chocolate lilies, grizzly bears, and humans (Turner 2014:162). Grizzly bears frequented these areas while in search of nutrient-rich roots and rhizomes. They typically gouged out the earth and weeded the small bowl shaped microhabitats. In scenarios like this, chocolate lily thrives because its small bulbets and sprouts are spread throughout the flats with the help of these omnivores. These small portions of the plant thrive in the freshly churned soil and enjoy the warm nutrient rich soils. Turner gave a personal account regarding how these plants can propagate with the help of the grizzly. She counted the number of total vegetative propagules from fifteen chocolate lily bulb sets that were removed from a single grizzly-created depression: the total number of bulblets and larger sprouting segments was 706 (Turner 2014:162). If each one of these was separated and replanted they would be capable of growing into a new plant. With the smaller propagules left behind after the grizzlies had their meals, there would be enough left behind to develop and reach maturity for humans to use as well in future seasons. Since, based on its existence and cultural use in northeast Asia and the Aleutians, chocolate lily may have been one of the most ancient foods along the coast known to the earliest people entering the New World, it is conceivable that Asian bears were the ones who originally taught people about its use (Turner 2014: 162).

Other aiding factors besides animals helped inform early people's understanding of the land. Sensory experiments more than likely help many people select food and medicine simultaneously. Taste and smell are important factors that could help shed light on the edibility of many different plant species. Most food plants are mild-tasting and lack strongly bitter flavors or intense odors (Turner 2014:432). Plants that contain any medicinal or pharmacological properties (such as the ones found in the Balsamroot outer skin) contain bitter-tasting and highly aromatic compounds, such as alkaloids or essential oils that make them unpleasant to consume except in small quantities or in diluted forms (Turner 2014:432). People were also guided by their existing knowledge of similar plants with similar scents and flavors.

Plant Cultivation and Habitat Modifications

As many researchers within the literature have noted, past generations of scholars tended to equate cultivation with the familiar practices and geometric patterns that characterized European agriculture (Deur 2005:14, Blaut 1993; Butzer 1990; Denevan 1992; Doolittle 1992). Until recently, many researchers looked at the unfamiliar and seemingly chaotic anthropogenic plant communities encountered in Non-western societies as "nonagricultural". In attempting to categorize these early forms of cultivation and gathering, some researchers gave arbitrary names for all of the world's peoples, which served to create more mystery than they revealed and served to limit the understandings associated with non-Western agriculture (Deur 2005:15). Fortunately, in more recent years what constitutes cultivation has grown to encompass a continuum of practices found throughout the non-Western world, from plant tending, to plant cultivation, and plant domestication. Current

definitions of cultivation are unified by their focus upon peoples' repeated and intentional manipulation of both plants and their environments as a means toward plant resource enhancement (Deur 2005:15).

As mentioned in earlier sections of this research, estuary gardens were also frequently utilized by northwest coastal people to promote higher numbers of edible rhizomes available and to supplement their diets and increase the yearly yield of food plants gathered for winter months. The soils within these gardens were frequently mounded and reinforced with rocks or wood abutments, which served to elevate the lower portions of the salt marsh on a backfill surface, which created larger gardening areas and extended the very narrow band of the high salt marsh where chocolate lily and other culturally preferred plants could grow (Figure 13 below) (Deur 2005:312). The soils in these gardens are an important resource to many Northwest coast peoples. The soils that accumulate in the upper salt marsh and the garden plots are rich in fresh sediments and organic detritus from riverine, estuarine, and marine sources, carried to the high tide like by peak tides and floods. A significant portion of each estuary's total organic output is redeposited to the upper salt marsh each year, making that portion of the Northwest coast estuary among the most productive environments in the world, if measured by carbon produced per unit of area (Deur 2005:313). Soils of this nature are typically much higher in nutrient composition than the majority of the region's rain-leached soils and are characterized by pronounced seasonal growth (Deur 2005:313). With these subtle modifications to salt marshes within the area, indigenous people within the region were able to maximize the productivity of these unique areas.

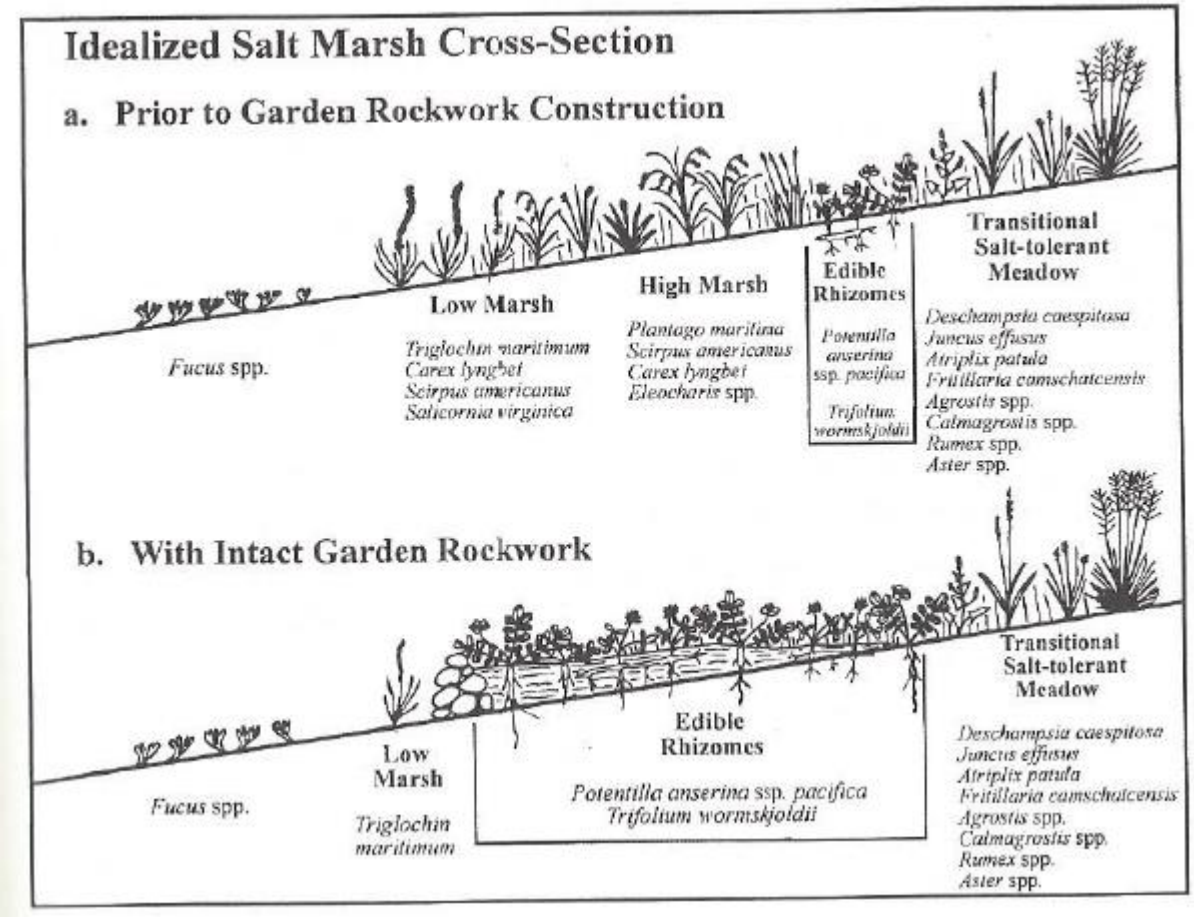

Figure 13: Diagram of zones in estuary with plant species listed below the zone name (Deur 2005:313)

Soils at gardening sites, whether they had mounds or rockworks, were traditionally and intentionally cultivated (Deur 2005:313). This form of maintenance was at times done separately from weeding or harvesting. Turning the soil within these traditional gardens increased the porosity of the soil and mixed in the most recent deposits of estuarine or alluvial debris that built up each year, which helped the gardens soil circulate and promoted growth for future crops in years to come. Northwest Coast people had their own taxonomies for different soil types and the properties that they preferred to use within their gardens.

Uniformity and distinctly branded strata are common features in tidal flats due to consistent waves and fluvial processes. In these areas, diverse soils with differing textures are rare and need modifications in order to increase yields within these estuary gardens. In order to promote rich soil that fosters the desired root crops, these gardens were frequently plowed and augmented with different texturally diverse soils from external sources (Deur 2005:314). These texturally diverse soils and the removal of rocks within the beds had palpable benefits for the size and quantity of estuarine roots. Roots that were large and straight were highly sought after for both dietary and ceremonial reasons. Gnarled roots were typically seen in unmodified or rocky soils and are in certain areas attributed to supernatural misfortunes that were remedied with different rituals when encountered. Removing estuarine roots and rhizomes unbroken was considered essential when being removed from the soil. Within certain groups, breaking these roots as they were extracted from the soil was considered inappropriate or even shameful (Deur 2005:314). Harvesting unbroken roots that were long and straight helped to facilitate root bundling and was also associated with high status.

Plant Modification and Intensification on the Northwest Coast

Northwest coast peoples were actively modifying many of the roughly 300 plant species that they used for foods, sources of material and medicines, and spiritual purposes (Deur 2005:17). All over the region and with different plants, many people seeded or transplanted propagules, intentionally modified soils, and weeded out a variety of competing plants. Many plant products were intentionally harvested in a sustainable way. Root vegetables were often harvested by size so that only the larger and older bulbs were taken, and the younger, smaller bulbs were left to grow for future harvesting. Root patches were also

weeded to help increase the competitive advantage and increase the productivity of the desired plant species in the patch. Thoms' model (1989:184) stresses the importance of the size of resource habitats or patches (Table 1). He also explains that people's reliance on camas will be dependent on the size of the available camas stands (people are most likely to use big stands) and on the distance to these stands of camas (Deur 2005:91). Typically, people frequently rely on stands and patches that are close, but they are willing to travel to stands that provide larger camas bulbs. Northwest food economies can be divided into two levels: a regional level and a local level.

TABLE 3.5. CAMAS INTENSIFICATION MODEL

1. Groups relying on camas as a staple should be those lacking adequate supplies of higher-ranked and intensifiable resources. Other things being equal, the intensity of camas intensification should vary inversely with the availability of anadromous fish.

2. There should be a positive correlation between intensity of camas exploitation and the size of productive camas grounds in a group's territories.

3. The degree to which groups rely on camas should vary inversely with transportation costs.

4. There should be a positive correlation between the use of camas and bulk processing, as measured by the use of large earth ovens and storage facilities.

5. There should be a positive correlation between the intensity of management techniques at camas grounds and population density. Such techniques can include ownership, weeding, watering, seeding, and transplanting of root grounds.

Table 1: Thoms' Camas Intensification Model (Deur 2005:91) (Thoms 1989:184)

Selective Harvesting of Plants

Selective harvesting of plants by their status, state, or size was an important aspect related to the plants' reproductive qualities and may potentially lead to genetic selection of traits such as early fruiting, larger bulbs or roots, sweeter larger berries, and other more desirable attributes (Turner 2014:198). For example, root vegetables, such as camas, chocolate lily, nootka lupine, and other plants, were commonly harvested at their fruiting or post fruiting stages when the leaves had started to fade and die back. In scenarios like this, ripened seeds were scattered when their dried seed capsules burst after being brushed, bumped, or even when blown in the wind (Turner 2014). As a result, at the same time as one generation of plants was being removed, the ground was being prepared for new growth the following year through digging, tilling, and weeding. By digging after the seeds had ripened, the people ensured that these plant seeds would be distributed into "prepared" beds (Turner 2014). Soil alteration may have been especially important for camas, which is restricted to habitats with poorly aerated soils, increased aeration resulting from digging probably increased nutrient cycling rates for the bulbs within these beds. Furthermore, not all camas bulbs were collected. Small bulbs were left to mature in the soil, and some bulbs were selected based on their gender. Most people who distinguish between the genders of these bulbs preferred female bulbs. While digging for camas the depth of disturbance ranged from 12 to 18 inches. The largest and most prized bulbs were found in the deeper portions of the soil (Turner 2014:199). Women used digging sticks to loosen the soil, and then sorted through the clods of dirt, breaking them up by hand, to gather the appropriate bulb.

When people harvest plants when seeds are ripe they ensure that they are getting the tastiest and most nutritious roots. The timing of their harvest was very important because stored nutrients are somewhat depleted through the fruiting or flowering processes (Turner 2014:199). When bulbs were harvested prior to seed maturity their tissues are soft, spongy, and flavorless. Once the seeds had matured, the bulb gains a finer texture and flavor and also contained a higher nutritional value (Turner 2014). In areas that were frequently burnt after the harvest in order to promote new growth the following year, seeds were covered with soil or settled into crevices that would protect them and catch any nutrient rich ash that was washed into the soil by rainstorms that followed the controlled burn.

Concepts of "Ownership"

Concepts of land ownership can differ between researchers and indigenous communities. In a conversation between a Saanich (Wsanech) elder from British Columbia and Nancy Turner and her colleagues, they discussed how this group at one point in time "owned" all the land on the Saanich Peninsula, which lies around and to the north of the present city of Victoria in B.C. The elder was quick to correct them by saying: "No, we did not own the land; we just lived on it and used it and looked after it there is a difference!" (Deur 2005:151). Although the elder, Gabe Bartleman, did not agree with the Euro-Canadian concept of "ownership" in regards to their tenure of the land, clear mechanisms for maintaining control and authority over traditional territories were in place. This situation points to an important concept; although indigenous groups lacked a sense of ownership, mechanisms were in place that helped their people become the dominate figures within the area (Deur 2005:151). Typically, the range of people's movements during their summer

activities and their seasonal rounds determined the "boundaries" of their territories (Deur 2005:151). These factors suggest that occupation, control of access, and rights to use were ways in which cultural groups defined and exercised rights to land and resources (Deur 2005:151). Many cultural differences among different groups and communities in regards to ownership of land and resources must be noted. Traditional patterns of ownership and tenure were severely altered and changed after European colonization and by the subsequent loss of so many people due to epidemics and diseases over the past 200 years.

Plant Preparations

Plant foods are quite unique in that they all require varying amounts of preparation before being consumed or used after harvesting. Some food, like stems, stalks, and berries were eaten fresh, but for many, cooking was necessary, and at least part of the yearly or seasonal harvest had to be dried or preserved for winter storage (Bouchard and Turner 1976:129). Roots, bulbs, and rhizomes were cooked in pits. Traditionally these pits were dug into the ground and lined with rocks. A fire was made in the pit to heat up the rocks and once the fire had burned, excess ash and debris was removed from the pit (Bouchard and Turner 1976:129). The hot rocks were then covered with a layer of damp vegetation; usually skunk cabbage (*Symplocarpus foetidus*) leaves, although this varied by group, personal preference, and area (Bouchard and Turner 1976). The food that was going to be cooked was placed into the pit and another layer of damp vegetation was then added to cover the food. Once fully covered a layer of dirt was added to cover the pit. A small hole was left at either side of the pit so that water could be added periodically to generate steam from the hot rocks and when not in use the holes were plugged with mud (Bouchard and Turner 1976:129). The steaming

process usually lasted about one day; when it was completed, the cooked foods were stored in a cool, dry place (Bouchard and Turner 1976:129).

Much research has been completed in the last twenty years that sheds light on the origins of earth oven and pit cooking technologies. These means of cooking allowed camas and other inulin-rich root foods to become food staples throughout most of the Holocene period. The earliest known earth ovens with rock-heating elements in North America are located along the ecotone between the southern Plains and southeast Woodlands, dating around 9,500 to 8,000 years ago (Turner 2014:362). In the Pacific Northwest, earth ovens with remains of camas bulbs were found in the Willamette Valley region of Oregon that date from around 8,000 years ago, and in the Calispell Valley in Washington state these ovens range in age from 6,000 to 5,000 years ago (Turner 2014). Earth oven technologies spread rapidly throughout the region starting in the plateau region and spreading into the Northwest Coast. These ovens were typically located directly above a camas meadow, adjacent to a forest that would have provided materials to fuel the fire and start the cooking process, and near a source of rocks to serve as the cooking element (Turner 2014:87). The measurements of these ovens typically ranged in size from 60 centimeters to 4 meters across and ranged from about 12 to 60 centimeters in depth.

This new cooking technology represented a relatively sudden dietary transition toward the use of more carbohydrate-rich root foods and vegetables. This new technological change developed in a time when the climate was relatively dry and the availability of wild game was decreasing and people within the region had to adapt and develop new means for gathering different food sources. These changes have been termed the “carbohydrate revolution” and

helped develop a means of plant intensification and land use within the region (Turner 2014:363). Pit-cooking also helped develop large-scale processing of many other foods, including balsamroot, nodding onion, yellow glacier lily bulbs, black tree lichen, and even some types of berries, as well as proteins such as clams and venison. The wide range of uses for this form of cooking speaks to how easily one form of cooking technology can be modified for a variety of foods and purposes.

Within Coast Salish communities some core values centered on food and dictated that food should be viewed as a blessing that should be shared, given, and received with gratification and respect. These blessings are gathered and prepared with thoughtfulness and an appreciation and respect for the plant that was harvested. Learning from the animal people, many indigenous ancestors learned plants that were safe to eat and possible means of preparation. Stewardship of the land and the many blessings of their reciprocal relationships helped many Coast Salish communities and the plant life they depended on flourish and thrive. New means of plant cultivation and propagation emerged which aided in an increased incorporation of plant foods into the diets of many people. These new forms of cultivation helped to ensure a dependable source of foods in years when some seasonal foods were scarce. An in depth and intimate understanding of plants and the benefits of selective harvesting ensured that many people who gathered these plants left immature bulbs and roots in the ground to grow larger for seasons to come. Advances in cooking technologies like earthen ovens helped increase large scale plant processing techniques within indigenous communities. After these advances occurred, a “carbohydrate revolution” began. Plant-based diets flourished and more nutrient based plant foods that preserved longer emerged.

As the inevitable march of time progresses undeterred and unabated, many aspects of the environment and native landscapes began to change. Rivers that once meandered freely are now levied or dammed controlling their flow for agricultural or industrial purposes. Many rivers within the region that once boasted marvelous runs of smelt and salmon now sit nearly empty. Once great estuaries and intertidal flats are now covered with backfilled soils to make way for an ever expanding urban area that continues to envelop the shores of the Salish Sea. Currently within the Salish Sea many ecological concerns are plaguing the region and its populations of native flora and fauna. Harmful toxins, urbanization, and a lack of unaltered shoreline continue to wreak havoc on native species and the indigenous communities that struggle to keep their traditions alive. Many sovereign nations within the Puget Sound region however, are making changes to keep their traditional food sources alive and continuing to ensure that their communities continue to thrive.

CHAPTER 5: PLANT USE THROUGHOUT TIME

Plant Use Post Contact

In a changing landscape and a time of uncertainty many changes affected the way of life for many native people. Post contact was a time of great pain and fluctuation as the United States government began to move into the area. New laws and acts were put into place to begin to mold the native population as the government saw fit. Their traditional way of life and their culture were in danger. Changes included their traditional diets, changes implemented by the U.S. government with new farming styles and meals within boarding schools changed the health and well-being of past and present native populations.

As Euro-Americans began advancing further and further westward, they placed significant pressures on the natural resources they encountered. Pressure set the stage for violent conflicts between settlers and indigenous groups (Krohn 2007:6). In 1853, after the state of Washington became a territory many tribes were moved onto reservations. The federal government believed that confinement to reservations would grant more access to the large numbers of settlers moving to the area with hopes of setting up homesteads. With few options many tribal communities within the area signed treaties after meeting with Isaac Stevens in 1855. Once the treaties were signed the U.S. government took control of over 64 million acres of land (Krohn 2007:6). Tribes were left to live on small parcels of land within reservations that they were unaccustomed to. Reservations also hindered their traditional way of living and compounded the spread of disease within groups that had been relatively isolated prior to contact (Krohn 2007:6).

Conflict between settlers and indigenous groups were common, and indigenous groups became the targets of animosity and violence as tension began to build over the Northwest's rich natural resources. In the treaties, tribal groups ensured that they would retain their rights to fish in "usual and accustomed places" (Krohn 2007:7). Initially the U.S. government failed to foresee the problems arising over resources and the conflicts that followed because they believed that settlers were interested in farming as a source of food, but they were gravely mistaken (Krohn 2007:7). Problems with treaty rights persisted within the area for many years and fishing rights were not actually upheld in the state of Washington until the Boldt decision of 1974. But tension between sports fisherman, the state, and tribal communities still persists even today (Krohn 2007:7).

In 1887, the General Allotment Act also known as the Dawes Act was implemented by the United States government. Native people living on reservations were told to select 160 acres of land on the reservations for each head of a family and 80 acres each for other tribal members (Krohn 2007:7). If they failed to choose, agents from the Bureau of Indian Affairs would choose for them. The purpose of this act was to destroy tribalism and open up reservation lands for non-native people to purchase. The new checkerboard reservations removed the power of "sovereign nations" and allowed the U.S. government to have jurisdiction over settlers within the reservations (Krohn 2007:7). Tribal land holdings decreased from 138 million acres to 48 million acres (Krohn 2007: 7). The act was repealed in 1934, but it had long-lasting and damaging effects within the fractured tribal communities that still in some cases persist today.

After indigenous people were moved onto reservations, they were expected to become "civilized" by ending their migratory lifestyle, adopting European farming techniques and utilizing European foods. The land that reservations sat on was at times inhospitable and far from the land people once called home. They were forced to leave behind crucial parts of their histories, land that carried the bones of their ancestors and their stories, customary gathering places and spiritual sites (Krohn 2007:7). Unfortunately, reservations were not the only hindrance to indigenous lives and cultures. Government mandated boarding schools were created for native children to mold them with ideals set forth by the U.S. government and Christianity. While away at these schools, native children's diets completely changed from traditional foods to refined high-carbohydrate foods (Krohn 2007: 8).

An Increase in Unseen Health Ailments

Indigenous teachings demonstrated that there must be a focus on the land, air, water, the plants and the animals simultaneously as we focus on human health (Krohn 2007:10). Coast Salish groups traditionally enjoyed a rich abundance of salmon, wild game, seafood, berries, roots and wild greens. Food was an integral part of social life and adhered to strict cultural protocols. These protocols protected natural resources and ensured their continued abundance (Krohn 2007:10). Indigenous groups within the area maintained traditional food systems. They understood that prairie areas where foods, such as camas, lilies, ferns, and berries, grew and needed to be burned every two to three years or the ecosystem would disappear and become evergreen forest (Turner 2005:159). Harvesting methods that were utilized often promoted the growth and production of plants. As Europeans settled within the area they banned burning and other traditional land maintenance practices which resulted in

many traditional food crops becoming increasingly more rare, which continues today (Krohn 2007:11).

Many traditional foods contained healing properties that promoted health and well-being. Many foods help to balance blood sugar and had anti-inflammatory properties. For example, both camas and balsamroot contain a compound called inulin which is a complex sugar that is not absorbed into the blood stream like other sugars. Animal fats, organ meats, and fatty fish like salmon are high in vitamin A and D, which helps the body, assimilate proteins and minerals (Fallon 2001). Coast Salish people ate a lot of fats including seal oil, bear fat, eulachon grease, and salmon.

> Because secondary compounds in some traditional foods and medicines actually have the ability to change our genes, it may be said that we have evolved with the things our ancestors ate (Nabhan, 2004). I have heard elders affirm this belief by saying that Indian people's bodies and spirits respond to native foods with profound recognition and knowing. Losing access to traditional foods was not only nutritionally devastating, it was also spiritually devastating (Krohn 2007:11).

After contact, the foods that were provided by the U.S. government were typically refined. More modern diets had adverse effects on native people's health. Tooth decay, narrower dental arches and crowded teeth were common problems for children born after contact and the implementation of modern diets (Schmid 1987:12). An increase in arthritis was also a common alignment post contact.

As time after contact continued, different methods of food processing began to emerge. Dehydration gave way over time to canning and jamming. Cache pits were replaced with root cellars and refrigerators, and food storage boxes. Ziploc bags and freezers became more efficient for storing berries than other traditional methods. All of these changes,

adaptations, and adoptions of new technologies and materials can be considered obvious and logical progressions and a part of cultural processes and responses to innovation that have been going on for a millennia (Turner 2014:257). However, food composition is also a biological process, and our bodies adapt over generations to certain diets. Abrupt changes to dietary regimes can lead to big problems (Turner 2014:257).

Plant Use Today

Traditional territories and traditional food staples have changed immensely since the arrival Europeans and Euro-Americans. Areas that were once rich with bountiful amounts of food plants and other culturally important flora and fauna are now urbanized areas or farm lands. Forested ecosystems that line the area are now fragmented because of large-scale industrial logging, urban development, agriculture, and power lines and transportation right-of-ways (Turner 2014:252). Ephemeral streams and other water courses are now dried up due to more extreme temperatures and the disruption of hydrology from logging and road building. Diking rivers, especially in river estuaries and floodplains, and the draining of lakes and other wetlands for agricultural production have also taken their toll. Construction of hydroelectric dams has inundated forests and covered traditional hunting grounds, archaeological sites, and in some cases entire villages within the Pacific Northwest. A number of industrial practices have served to pollute the area with pesticides and herbicides. Also, the introduction of exotic non-native plant and animal species has served as a burden on many native species within the area. The prevention of traditional ecological land maintenance techniques has also propelled the growth of these non-native species. Plants that were once removed by controlled burns, selective harvesting, and other management techniques grew

rampant once native groups lost access to their traditional lands, and their rights to tend to the land as they had for many years prior. With all of these factors at play in an ever increasing industrial urbanized world, it is easy to see why there is a loss of traditional plant uses and in some case even the knowledge associated with them. Too many factors are hurting the native plant species and presently efforts to maintain their populations and restore their numbers are inadequate.

Within the past half-century in particular, many indigenous communities have experienced a relatively dramatic and fundamental shift in the foods people eat on a daily basis. This shift can be attributed to the lack of local indigenous foods they consumed, along with fresh garden vegetables and fruits, and a coinciding increase in marketed food. Much of these foods are high in unhealthy fats, refined carbohydrates, and starches (Turner 2014:257). The convenience factor of modern foods and modern food sources is undeniable. This relatively abrupt food change is known as a "nutritional transition" (Turner 2014). This transition has resulted in significantly higher health problems in modern indigenous cultures than the health related issues their ancestors faced. In some indigenous communities, the rate of diabetes is five times higher than that of the general population (Turner 2014).

A key problem for many indigenous communities today is poverty and a lack of food security. In British Columbia for example, the average annual income for non-indigenous people is $25,000, whereas the annual income for first nation's people is only $13,000 (Turner 2014). Some people who live on reservations in British Columbia live below the poverty line and have inadequate access to food or shelter (Turner 2014:258). People who live in these conditions usually live in food deserts and have limited access to food, and the food

they are able to acquire is of low quality. Another important hindrance these people face is how severely their access to traditional foods has been impacted. The cost of travelling to traditional spring and fall harvesting areas has prevented many people from incorporating these foods into their daily diets.

Problems arising from less healthy diets are being exacerbated by the fact that people are leading less active lifestyles. For reasons already mentioned, people are unable to go out onto the water and the land to harvest and manage their own foods to the same extent as their ancestors. In many ways, access to healthy and fresh foods is a problem faced by indigenous and non-indigenous groups. Most people living in our society now depend more on low cost market foods rather than procuring their own items. A delicate balance exists between the health and cultural benefits of traditional foods and the local access available to make these foods more convenient and available to a wider scale of people within indigenous communities. This balancing act has developed into a key issue in addressing the effects of the nutritional transition (Turner 2014:258). Over time, the benefits of traditional foodways have been something people knew about but were not able to partake in. Recently, the health impacts that are associated with refined foods from the supermarket have been recognized and an important resurgence of interest in the cultural values of traditional food has emerged. As a result, a number of different initiatives have been aimed at revitalizing and celebrating the use and potential of local traditional foods (Turner 2014:258). These initiatives represent wider efforts for cultural renewal and the movement toward food sovereignty in many different Coast Salish groups. They also signify efforts to increase the health of the people living within indigenous communities and provide means to obtain fresh fruit and vegetables in areas that have little or no access to these healthy and nutritious foods.

As more tribal communities begin to revitalize their traditional pathways it becomes apparent that culture does not only come from the past, it can be a powerful tool for cultural identity and it becomes a living history when it is brought into the present (Krohn 2007:14). In 2000, the Center for World Indigenous Studies began offering workshops for Northwest Tribal communities on culture, foods, and medicines. These workshops promoted learning through stories, visual documentation, tasting, smelling, touching, harvesting, and processing traditional foods. Native nutrition was taught through the "Salish Food Mound" as opposed to the food pyramid (Krohn 2007:15). This food mound addresses nutritional differences between indigenous foods and introduced foods and offers dietary guide lines specifically for Salish people (Krohn 2007:15).

CHAPTER 6: RESOLUTIONS

Muckleshoot Food Sovereignty Project

The Muckleshoot Tribe is striving to develop programs that utilize both traditional and current food knowledge for current and future generations to understand and enjoy. The Muckleshoot Food Sovereignty Project was established in 2010 to help increase the understanding of native foods and build community food security by exploring the Muckleshoot Tribe's food assets and access to local, healthy and traditional foods. This program promotes and encourages community engagement through local discussion, monthly articles in the tribal newspaper, and hands-on workshops. Within this program, traditional food principles are coupled with a modern approach to a traditional foods diet and cross generational cultural sharing, culminate in seasonally rich feasts featuring local, traditional foods. They also assist with traditional feast for community events and have installed three gardens that serve as food production and educational spaces on the reservation. The language program at the Northwest Indian College has also developed a curriculum around the gardens, and created signs for each plant in three languages: English, Latin and Lushootseed. While the program still encourages people to go into the woods and other areas to gather traditional foods, they hope that this program and its gardens will serve as a way of bringing fresh foods and vegetables to the community and will provide a means to get people interested and involved with the foods they are eating and harvesting.

This program and its goals are ideas that were put forth by the program's project coordinators, Valerie Segrest and Miguel Hernandez, the Community Gardener and Project Assistant. Valerie is now the director of the traditional plants and medicines department

within the Muckleshoot Tribe. With the help of Valerie and adhering to the Muckleshoot Food Sovereignty program's goals and guidelines, this research was geared toward evaluating the inclusion of traditional food plants into personal gardens within the Muckleshoot community and developing an increased involvement and awareness of these plants in current and future generations.

Community Participation and Community Workshops

Many people within indigenous communities are experiencing similar difficulties when it comes to accessing traditional foods. For a multitude of different reasons, it is becoming more and more difficult to incorporate foods used traditionally into the everyday diet. These difficulties compounded with an unprecedented change in diet have had many adverse ramifications in many indigenous communities. The goal of these classes is to expand access to camas, balsamroot, and chocolate lily and help people incorporate these three traditional plants into their diets with relative ease.

As mentioned in previous sections, plants are one of the greatest teachers in Coast Salish communities. They show their love by returning in abundant numbers each year as the seasons renew and in return the Coast Salish return the love and treat the land with respect and reciprocity. With this sentiment in mind, community workshops have been developed to incorporate traditional teachings and ground the classes in traditional stories that set the stage for that day's course. Although these stories have not yet been chosen, an example of a story would be about how salmon became food for the people at the beginning of the day. In order to adhere to the Coast Salish traditions, each of the three workshops will be rooted in their oral traditions because those stories are their historical ways of learning and knowing. Ideally,

with Valerie's help, we will enlist the help of Roger Fernandes who is a wonderful storyteller and teacher who lives within the area to start the class with whichever stories he feels are appropriate.

After the hour long cultural grounding has taken place, a discussion session will begin. In this portion of the workshop, we will check-in with the participants and ask them what they hope to learn from the workshop. This section will help us fine-tune the next few classes and will more than likely help Valerie determine some of the classes she wants to the develop in the future as well. Information on the traditional plant uses and their stewardship will be presented after the discussion using a majority of the data located within the earlier sections of this thesis, including how they are traditionally harvested and proper plant replacement. Val's teachings have been centered on the idea of taking a bulb and replacing it with a seed which will be taught in these classes as well because this practice ensures that we are replacing what we are harvesting.

The next section of the workshop will include some kind of hands-on activity. We have yet to fully determine whether it will include harvesting or planting these plants, but because these workshops will be occurring in late May or early June, we are going to attempt to harvest the plants as most of them will be blooming and ready to harvest at this time of the season. Traditional harvesting or planting techniques will be employed for whichever option is the most favorable at the time. If we do plant some of these plants, I am hoping that we can begin to incorporate them into the Muckleshoot community garden (with permission from the tribe) for more people to access later once the plants have matured.

Covering how these three plants have been cooked and preserved will be an important aspect of the research after the hands-on activity. Here we will incorporate both traditional and more modern means of cooking and preserving so that people have an understanding of both the past and the present. We will be walking participants through cleaning and preparing each bulb or root and how to cook them. In each workshop handout that participants will receive, there will be a recipe for each plant that will give people options on how to start preparing these foods. Finally, means of preserving these plants will also be covered including whether drying them or freezing them in their freezers at home is best. The overall goal of this section is to get people comfortable with handling these bulbs and roots when they take them home and begin to work with them on their own.

Finally, the workshops will close with a reflection activity. Typically Val invites elders to the workshops to let them witness the work of the day and then allows them to lecture at the end. Allowing time for elders within the community allows elders "to be Elders and do their work," as Val says. An elder presentation closes the workshop with more cultural context and guidance from respected elders within the community. Additional discussion from participants would be encouraged once the elders are done speaking.

Utilizing Traditional Plants in Personal Gardens

Although it is not yet known if we will be handing out seeds or seedlings, it is my hope that we can use containerized seedlings. Using this type of seedling ensures that the seedlings are intact without exposure. Bareroot seedlings are also an option but seem less optimal because these seedlings must be dug free from the soil which exposes their roots to drying conditions. Containerized seedlings are more preferable because they are already

established, quicker growing, and have a higher survival rate (Plants of the Wild). They are also easier to plant and have fewer problems with root deformation. Using this type of seedling prevents drying conditions that can kill seedlings before they are planted, which leads to their higher success rate when planted into personal gardens.

Because these plants will be planted in the personal gardens of participants of the workshop, there will need to be some guidance on how to prepare the soils at their home gardens for these plants. In order to prepare their gardens, they must remove all competing vegetation from the immediate area of their garden that they are planting the seedlings in. Unwanted vegetation can be prevented and controlled by the use of fabric mulch mats. Lastly it is a good idea to form a trough around each plant so rainwater can collect in the depressions (Plants of the Wild).

Caring for the seedlings and planting them within ten days is the next critical step in this process. Seedlings should not be exposed to sun, wind, low humidity, or freezing temperatures before planting because it is detrimental to seedling survival (Plants of the Wild). Seedlings must also be kept moist until planted. When planting these seedlings, remove one seedling from the bundle at a time and only after the hole is dug. Make sure that each seedling is upright and that the ground around it is firmly packed to remove any air pockets, but not compacted around the seedling. The rooting media (the top of the root plug) should be covered with a half inch of soil (Plants of the Wild). Finally, if possible, water the newly transplanted seedlings with one to two gallons of water. Making sure that the root plug does not become exposed after final watering.

CHAPTER 7: DISCUSSION AND CONCLUSION

Overcoming barriers

Many environmental risks and barriers within the region contribute to difficulties maintaining a traditional food diet and harvesting different foods in traditional ways. Although there have been great losses associated with traditional foods there is still a sense of hope within tribal communities throughout the region. Community food security is a topic that is frequently discussed by many people within tribal communities. Community food security can best be described from a traditional and historical standpoint. Coast Salish people traditionally ate many types of seasonal foods from a variety of different ecosystems. Because of this, their ability to access food was fairly stable. In years when particular animals or plants were scarce, there were other options they could access other foods as supplements in their diets. The greater the diversity of foods that people ate, the better their health was and the more secure their food supply (Krohn 2010:16).

Terms like food sustainability and food sovereignty are used to describe whether a community has access to high quality local foods (Krohn 2010:16). Sustainability is used to describe the capacity to endure over time. In nature, sustainability means that biological systems need to remain diverse and productive (Krohn 2010). People have the capacity to live sustainably when they take care of the natural resources that support them and ensure that they are harvested in a manner that will ensure their return. Lastly, sovereignty is the ability to have supreme independent authority over a territory. Therefore, communities that have food sustainability and food sovereignty have access to healthy foods, foods that are culturally appropriate, distribute foods in ways so that people get what they need to stay healthy, and

adequately compensate the people who provide the food (Krohn 2010:16). When tribal communities are able to produce more of their own healthy food, they are less restricted by state and federal food programs. According to the Food Sovereignty Assessment Tool designed by the First Nations Development Institute (2004):

> Assuming power to localize your food supply affords opportunities to regain control of the most significant assets possessed by Native communities. Conscious management of food supplies affords opportunities for tribal use of land, deliberate control of health, sustainability of the environment, and maintenance or revitalization of cultural integrity (Krohn 2010:17).

Community food security, food sustainability, and food sovereignty are terms that describe the goals that are centered on current food restoration programs within tribal communities throughout the Pacific Northwest. Some restoration programs include community food gardens where people learn to plant, grow, harvest, and cook with both traditional and non-traditional fruits and vegetables. Native food restoration projects plan programs to help recover plants, fish, shellfish and other native food populations, and community food banks where hunters, fisherman, and gatherers can donate extra food to elders and other community members. Some groups are also trying to develop partnerships with the U.S. Forest Service, Department of Natural Resources and private land owners that allow tribal people to access traditional harvesting areas. Other potential partnerships include partnerships with local farmers who are willing to supply produce to tribal communities (Krohn 2010:17).

In 2000 the Center for World Indigenous Studies began offering workshops for Northwest Tribal communities on culture, foods, and medicines. These workshops are usually three days long and participants learn through a number of different methods that include visual documentation, stories, tasting, smelling, touching, and harvesting and processing. The

knowledge that is presented in these workshops is specifically tailored to each community that is participating. These specialized workshops include historical context and what foods are available within that area (Krohn 2010). The emphases of these lessons are centered upon learning through doing and learning and transferring new information with one another.

Native nutrition is also taught using the Salish Food Mound as opposed to the food pyramid. This addresses the nutritional differences between indigenous foods and introduced foods, and it offers dietary guidelines specifically for Salish people (Krohn 2010:18). These nutrition-based teachings also try to promote and teach healthy diabetes-preventative diets. This is an important aspect because many people experience a lot of confusion when it comes to what a diet of this nature should entail because there have been so much contradictory information that has come from nutritionists and doctors over the years. The workshops try to clear up this confusion by using traditional knowledge and scientific research to acknowledge the healthy benefits of native foods and medicines (Krohn 2010).

In 2009, the Muckleshoot tribe opened a new K-12 tribal school. They hired a tribal school nutritionist to offer high quality nutrition education to both students and parents within the community. A goal of this program is to include the voice of tribal members to address issues of health disparities within the community through nutrition education. This education program includes hands-on learning opportunities that reinforce the experiential learning style of their ancestors through working with the students to build a garden and working with teachers to develop curricula related to the garden (Krohn 2010:19). The school also has a specialized lunch program that has set standards for the kitchen that will help reinforce a healthy eating style that is close to a traditional diet. These standards include no trans-fat and

hydrogenated oils, no high fructose corn syrup, ordering local and seasonal produce whenever available, reducing sugar by offering a low-starch and dessert free menu, taking a home-cooking approach to both breakfast and lunch, supporting tribal enterprises by purchasing seafood from Muckleshoot's Seafood Products, and requiring a traditional foods meal once a week (Krohn 2010:20). This project is ongoing and collaborative, and it strives to engage its participants in addressing health concerns. It also builds knowledge and experience within the tribal community around nutrition and traditional foods in an appropriate cultural context. The main goal of this program is to support the overall health of the community through cultural continuity (Krohn 2010).

Food is an important aspect of culture. It shapes the health of the people enjoying its nutritive values and brings communities and families together. Many different partnerships and initiatives have developed in many tribal communities throughout the region to improve the health of its members. A complex chain of factors contributes to the desire and instigation of social change centered on food- cultural, economic, environmental, and political to name a few (Krohn 2010:27). Although these different food sovereignty and sustainability programs are only small portions of the puzzle they bring many beneficial aspects to the communities that develop them. Within these programs ideas are shared, connections are made, both traditional and new recipes will be prepared and healthy foods are served on tables throughout the community. Within the region there are many barriers that prevent people from enjoying traditional diets, but with programs that support the community like the ones explained within this section, the revitalization of plants and the environment along with improved health of tribal members are attainable goals that will have beneficial impacts that future generations will be able to enjoy.

Potential for Future Research

A complex relationship involving interconnected events joins people, plants, and the environment. These relationships should be researched further to bolster awareness behind improving the environment and ensuring the propagation of more native plant species within the Puget Sound region. It is my hope in the future that I can continue to work with different plant species so that they can be utilized by more people and help to return people and their environments to a healthier state. In an age when climate change is starting to become a huge topic for debate, I would like to begin teaching more people at the collegiate level about the dynamic and interconnected relationships between people and their environment and how the presence of more native plants, both edible and non-edible, can help the environment heal.

As a sovereign nation, the Muckleshoot tribe is committed to the health and well-being of both their residents and their environment. They have made many positive changes within the community that have served to provide accessible fresh produce, education programs focusing on nutrition, and an infrastructure that supports local fishermen and farmers. As the tribe begins to consider a relationship with the University of Idaho, it is my hope that more student researchers can begin conducting research within their community. This would create a reciprocal relationship in which both parties would benefit from new ideas and an increased amount of data gathered on a limitless amount of research topics. Numerous departments present at the University of Idaho could develop programs that could restore more native plants within the area or research dwindling salmon populations within the Green, Duwamish, and White rivers and develop plans to begin restoring these vital runs to their past size within the area.

Conclusion

Throughout history many indigenous groups within the Puget Sound region have relied on over 300 different plants species for foods, medicines, and wares. Their stewardship of the land and seasonal rounds were dictated by the availability of many different plants and animals. In past and present Coast Salish communities, food in many regards is the essence of their culture. For Coast Salish people food served as a tool that could unite and bind families, communities, and histories to their homes and cultural identities.

Shortly after the creation of the world, animal people roamed the land. These people helped human people gather insights into the world and prepared them for events that would happen in the future. These animal people also provided insights and teachings to those who listened. These teachings were considered a blessing and were passed on throughout many generations in the form of creation stories. Within these stories are overarching themes of resiliency, return, and perseverance in the face of adversity. At the beginning of this text a traditional southern Lushootseed story called “Fly” was presented. This story, like many others, offers wisdom to those who read it. Fly depicted the voyage of a young boy who struggled to find where he belonged. He went on a long journey throughout this world and the sky world. Along the way he encountered many human and animal people and learned valuable lessons throughout his voyage. Fly has overarching themes of gratitude for the plants within the region and explains how these plants were brought to this world. It also explains that taking the easiest path is not always the best course of action. This teaching perfectly demonstrates the struggle many contemporary native groups are facing. As a result of colonization and industrialization it has become increasingly difficult to maintain a traditional

foods diet. But as we see within the teachings of Fly, things that are worth having sometimes require tedious work, persistence, and perseverance. Preserving traditional lifeways is not easy within modern times but it is a critical part of many Coast Salish people's cultural identity, and the struggles they face are worth the effort to maintain them. Fly seemed like a fitting story with ample lessons that pertain to the struggles many sovereign indigenous groups have faced throughout their histories.

Other stories that are prevalent within the Coast Salish region depict terrible fights between thunderbird and whale. Their fight resulted in a large earthquake that caused an enormous tsunami to swallow many coastal villages on the coast of Washington state. Within the indigenous creation stories of the coastal regions that this research is centered upon there are overarching themes of resiliency, return, and perseverance in the face of adversity. Unpredictable events and natural disasters that shape the landscape within the Pacific Northwest are nothing new to the indigenous groups within the area. Since time immemorial people have adapted and changed to an environment that is constantly in flux and can at times be dangerous and unpredictable. The region's indigenous communities and its flora and fauna have adapted to these events.

Many traditional teachings that focus on the use of traditional plants represent a cultural belief, a sanction against destroying culturally and ecologically important species and habitats (Turner 2005:20). These teachings shaped the way indigenous cultures interacted with the environment and how they tended the land that provided them with abundant plant foods that they depended on to survive. The active cultivation of plants that was taking place within North America prior to contact with Europeans was a piece of history that was not

highlighted in most of the early writings by anthropologists and other Europeans documenting indigenous lifeways (Joseph 2011:11). Traditionally, many plants were cultivated with methods that included tiling, weeding, and fertilizing. These techniques also included large scale modifications and alterations of the natural environment to increase the productivity of preferred species.

Prior to contact with Euro-Americans, Coast Salish people accessed an abundant and diverse spread of flora and fauna which they utilized to create a well-balanced and healthy diet. Plant foods maintained sustainable aspects to their diets and also provided dietary diversity, essential vitamins, minerals, carbohydrates, and dietary fiber. Plant foods also carried strong socioeconomic components for plant propagation and management because plants were valued items of trade and exchange, thus serving, practically and symbolically, as wealth (Deur 2005:334). Many Coast Salish people believed in eating with the seasons. Traditionally and in more recent times, many people harvested a variety of foods seasonally and believed that seasonal eating ensured that there will always be an abundant amount of food available throughout the year. It is also widely believed that eating seasonally prepares people and their bodies for the change of seasons.

Northwest Coast peoples were actively modifying many of the roughly 300 plant species that they used as foods, sources of medicines and materials, and for spiritual purposes (Deur 2005:17). All over the region and with different plants many people seeded and transplanted propagules, intentionally modified soils, and weeded out a variety of competing plants. Many plant products were intentionally harvested in a sustainable way. Bulb vegetables like camas and chocolate lily were usually harvested by size so that only larger

bulbs were taken and smaller bulbs were left to mature for future seasons. Selective harvesting of plants by status, size, and state was an important aspect related to the plants reproductive characteristics and may potentially lead to genetic selection of traits such as early fruiting, larger bulbs or roots, sweeter larger berries, and other more desirable attributes (Turner 2014:198).

Plant foods are all unique. Each food type requires varying amounts of preparation before being used or consumed after harvesting. Roots, bulbs, and rhizomes were cooked in earthen ovens or cooking pits. Pit cooking these types of plant foods allowed camas and other inulin rich root foods to become food staples throughout most of the Holocene Epoch, which began 11,500 years ago. This cooking technology represented a relatively sudden dietary transition toward the use of more carbohydrate rich foods and vegetables. After these cooking advances occurred a "carbohydrate revolution" began and plant based diets began to flourish and more nutrient rich plant food that preserved longer emerged.

As more European settlers began pushing further west, many things began to change within the Pacific Northwest. It was a time of great uncertainty, and many changes began affecting the traditional lifeways of indigenous people throughout the Puget Sound region. As the United States government began to move into the area, new laws and acts were put into place to begin to mold the native population as the government saw fit. Their traditional way of life and their culture were in danger. This included their traditional diets, changes implemented by the government with new farming styles and meals within boarding schools changed the health and the well-being of past and present native populations. In 1853 after the state of Washington became a territory, many tribes were moved onto reservations. In 1855,

tribal communities signed treaties with Isaac Stevens. Once the treaties were signed the United States government took control of over 64 million acres of land (Krohn 2007:6). Many tribes were left to live on small parcels of land within reservations that they were unaccustomed to. Reservations also hindered their traditional way of living and compounded the spread of disease within groups that had been relatively isolated prior to contact (Krohn 2007:6). After people were moved onto reservations, they were expected to become "civilized" by ending their migratory lifestyle, adopting European farming techniques, and utilizing European foods. After contact, the foods that were provided by the U.S government were typically refined. This new and more modern diet had adverse effects on native people's health. Tooth decay, narrower dental arches, and crowded teeth were common problems for children born after contact and the implementation of modern diets (Schmid 1987:12). An increase in arthritis was also a common alignment post contact.

Traditional territories and traditional food staples have changed immensely since the arrival of Europeans and Euro-Americans. Areas that were once rich with food plants and other culturally important flora and fauna are now converted into urbanized areas or farmlands. Within the past half-century in particular, many indigenous communities have experienced a relatively dramatic and fundamental shift in the foods they are eating on a daily basis. This shift can be attributed to the lack of local indigenous foods consumed, along with fresh garden vegetables and fruits, and a coinciding increase in marketed food. Much of these foods are high in unhealthy fats and refined carbohydrates and starches (Turner 2014:257). The convenience of modern foods and modern food sources are undeniable. This relatively abrupt food change is known as a "nutritional transition". This transition has resulted in significantly higher health problems in modern indigenous cultures than the health related

issues their ancestors faced. In some indigenous cultures, the rate of diabetes is five time higher than that of the general population.

A key problem for many indigenous communities today is poverty and lack of food security. Many people who live in conditions of poverty live in what is called a food desert. Under these conditions, people have limited access to food, and the foods that they can acquire are of low quality and are usually unhealthy. Another important hindrance that many indigenous cultures face is how severely their access to traditional foods has been impacted. The cost of traveling to traditional spring and fall harvesting areas has prevented many people from incorporating these foods into their daily diets.

Over time, the benefits of traditional foodways have been something that people knew about but were unable to partake in. Recently there has been resurgence in the recognition of the health impacts associated with refined foods from the supermarket and an important resurgence of interest in the cultural values of traditional food plants. As a result, there have been a number of different initiatives aimed at revitalizing and celebrating the use and potential of local traditional foods (Turner 2014:258). These initiatives represent wider efforts for cultural renewal and the movement toward food sovereignty in many Coast Salish groups. They also signify efforts to increase the health of the people living within indigenous communities and provide a means to fresh fruit and vegetables in areas that have little to no access to things of that nature.

In 2010, the Muckleshoot tribe took strides to develop their own food sovereignty by establishing the Muckleshoot Tribal Food Sovereignty Program. This program promotes and encourages community engagement through local discussion, monthly articles in the tribal

newspaper, and hands-on workshops. The program teaches traditional food principles that are coupled with a modern approach to a traditional foods diet and cross generational sharing, which culminate in seasonally rich feasts featuring local traditional foods. They have also developed a community garden that serves as a space for food production and also as an educational space. Their hope is that this program and its gardens will serve as a way of bringing fresh foods and vegetables to the community and will provide a means to get people interested and involved with the foods they are eating and harvesting as well as giving their community members a medium through which they can take control of their own health.

Within the Salish Sea there are many ecological concerns that have created barriers in maintaining a traditional foods diet. Their barriers are being compounded by the adverse effects of historically imposed modern diets on many indigenous groups throughout the region. Although there have been great losses associated with traditional foods there is still a sense of hope within indigenous communities throughout the region. In more recent years many Coast Salish groups have developed programs that are aimed at developing community food security, food sustainability, and food sovereignty. Within these programs community gardens, native food restoration projects, and community food banks have flourished. Some tribal groups have even developed partnerships with government agencies and private landowners to provide their community members access to more traditional harvesting areas. As this movement has developed, organizations like the Center for World Indigenous Studies have begun offering workshops to more northwest tribal communities which offer traditional food programs taught using the Salish Food Mound. Other tribes, like the Muckleshoot tribe, have taken food sovereignty programs into their tribal school systems. These programs serve

healthier meals to their students, which include items harvested by local native farmers and fishermen and feature a traditional foods meal once a week.

Although these programs are only a small portion of the struggle to access traditional foods, they provide the communities who develop them with a multitude of beneficial aspects. Programs of this nature are a representation of the embodiment of the "Fly" story because for many years many indigenous communities have struggled through poverty and attaining nutritious food. But much like the main character of the story, indigenous groups are pushing forward with persistence and perseverance to develop a means to become healthier as a people once more. Food sovereignty programs facilitate the sharing of ideas, community participation, access to fresh fruits and vegetables, and traditional plant foods to all of its community members. These programs also ensure that the traditional knowledge surrounding traditional food plants is passed on for present and future generations to enjoy. With the help of these programs many people are connecting the foods they eat with their own cultural identities. These two components are central to studying traditional foodways in indigenous cultures. Foodways offer a path to cultural preservation and community health. It can also serve as a space where people can position themselves within their own heritage and environment. This research and future work within traditional food restoration will continue to give people a platform to share their gifts with other community members and will serve as a means to help people discover unfilled niches within the community and develop the skills to fill them. While there have been enormous changes in both Coast Salish diets and their culture over the centuries, a core value of food has survived: food is a blessing, gratefully and respectfully gathered and prepared, given and received with just as much gratification and respect (Salish Bounty 2013).

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APPENDICES

APPENDIX A: *Future Class Curriculum*

WILD ROOTS

"Plants have been a vital part of the ecosystem since time immemorial. I have heard them referenced as "old people" because of the wealth of knowledge each plant holds. "

-Whitney Matthes, 2015

MUCKLESHOOT TRADITIONAL PLANTS AND MEDICINES IN PARTNERSHIP WITH A UNIVERSITY OF IDAHO GRADUATE STUDENT

MAY 2016, 9:00-5:00
AT THE CANOE PEOPLE COMMUNITY CENTER

39009 172nd Ave. SE Auburn, WA 98092

TAUGHT BY VALERIE SEGREST AND WHITNEY MATTHES

Class Outline

9:00 AM- 10:00 AM- Respected storyteller, Roger Fernandes (if he agrees or we could include anyone else who is willing here), will begin this workshop with creation stories that involve the three plants today's class will cover.

10:00 AM- 12:00 PM- Group discussion; checking with class participants to better understand why they were interested in coming to the workshop and what they hope to learn. Information on the three plants that this workshop will cover will be presented here.

12:00 PM- 4:00 PM- Day One Activity- Harvesting and preparing the three plants

Day Two Activity- Preparing the plants and cooking them

4:00 PM- 5:00 PM- Reflection Activity; Talks from respected elders within this community will discuss the day's events and ground the days lesson in cultural context. Could also incorporate participation from people taking the class… having them explain what they enjoyed the most, what they will do with what they have learned, and understand what they would like to learn about next.

APPENDIX B: ***Internal Review Board Letter of Approval***

University *of* Idaho
Office of Research Assurances
Institutional Review Board
875 Perimeter Drive, MS 3010
Moscow ID 83844-3010
Phone: 208-885-6162
Fax: 208-885-5752
irb@uidaho.edu

To: Rodney Frey

From: Jennifer Walker
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Date: 8/21/2015 2:10:51 PM

Title: The Relationship between Plants and People: An Ethnobotanical Study in Partnership with the Muckleshoot Tribe

Project: 15-899
Approved: August 21, 2015
Renewal: August 20, 2016

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project is approved as offering no significant risk to human subjects.

This study may be conducted according to the protocol described in the application without further review by the IRB. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

This IRB approval is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within Native Institutions, which have their own policies that require approvals before Human Participants Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

As Principal Investigator, you are responsible for ensuring compliance with all applicable FERPA regulations, University of Idaho policies, state and federal regulations.

This approval is valid until August 20, 2016.

Should there be significant changes in the protocol for this project, it will be necessary for you to submit an amendment to this protocol for review by the Committee using the Portal. If you have any additional questions about this process, please contact me through the portal's messaging system by clicking the ‘Reply’ button at the top of this message.

Jennifer Walker

APPENDIX C: ***Muckleshoot Tribal Council Letter of Approval***

MUCKLESHOOT TRIBAL COUNCIL
39015 172nd Avenue S.E. • Auburn, Washington 98092-9763
(253) 939-3311 • Fax (253) 931-8570

September 2, 2015

Dear review committee:

The Muckleshoot Tribal Council is writing in enthusiastic support for Whitney Mathis' graduate research project. It is our understanding that she will dedicate her graduate studies culminating project towards developing useful educational resources regarding ethnobotanical uses of certain plants in our community, both past and present. We believe this work will be instrumental and complimentary work towards our food sovereignty efforts. Applied practice and useful research is something we strongly support and encourage. Ms. Mathis has assured us that we will be informed in her process and all sensitive material will be approved by us before dissemination.

We believe the project proposed will provide meaningful outcomes for the tribe's initiatives, and promote engagement of Puget Sound tribal members in healthy food behaviors and activities.

Sincerely,

Virginia Cross
Muckleshoot Tribal Chair

APPENDIX D: *Sample Interview Questions*

Research Interview Questions (Plant Knowledge – Ethnographic Inventory)

After introducing the project, with Tribal approval and support, after reviewing the possible risks and benefits and having the interviewee read and sign the Informed Consent Form, and after securing use of an audio recorder for the interview, the following semi-structured questions would be asked:

A. Demographic Information: what is your age, gender, family affiliation, and upbringing?
B. Inventory Information: what is your knowledge of Camas (Camassia quamash), Balsam Root (Balsamorhiza deltoidea), and Chocolate lilies (Fritillaria camschatcensis)?

Possible follow-up questions:

1. How frequently are plants harvested in this area?

2. When was the last time you ate any of these plants included within this study?

3. How commonly were these three plants eaten?

Seasons most prevalent?

In what circumstances?

4. What is the significance and meaning of these three plants to you?

Nutrition

Potential medical uses

Cultural Heritage

Other

5. Do you have information, from remembrances or personal experiences, on preparations necessary before gathering?

Various ways?

6. Do you have information, from remembrances or personal experiences, on the activities associated with actual gathering?

Special right to do so?

Particular knowledge and background to do so?

Prayers? Addressed to whom and why?

Offerings made or gifts given to the plants being harvested?

Tools for gathering?

How much would be gathered?

Other considerations in gathering?

Special locations and permission to access?

7. Do you have information, from remembrances or personal experiences, on the activities associated with preparing to eat these three plants?

8. Do you have information, from remembrances or personal experiences, on the activities associated with storing any of these three plants?

9. Do you have information, from remembrances or personal experiences, on the events, situations or contexts within which these roots would be served?

10. Do you have information, from remembrances or personal experiences, on activities associated with distributing root crops to others within the community?

Who would be possible recipients? And why?

How much would be shared?

11. Do you have information, from remembrances or personal experiences, on the changes over time on the availability of these plants or other plants native to the Muckleshoot plateau?

Are there fewer or more or the same amount available today?

What are the causes of those changes?

12. Do you have additional information, from remembrances or personal experiences, on these plants, not asked of you in this interview?

13. Do you believe that industrialization and logging played a role in the amount of plants available for human consumption?

14. Would you be willing to share some of this information to other members of the community in a classroom setting?

15. Who would you recommend me talking to next that might have information on these three plants?

APPENDIX E: ***Informed Consent Form***

Informed Consent Form

Approval: Muckleshoot Tribal Council and the University of Idaho Institutional Review Board have approved this project.

Project Title: *The Relationship between Plants and People: An Ethnobotanical Study in Partnership with the Muckleshoot Tribe.*

Project Description: This study will document the past and present uses of three plant species, utilizing community based research methods and to utilize research data to: Camas, Chocolate Lily, and Balsam Root. Traditionally, these three bulbs have been a food staple as well as medicine for the Muckleshoot people. This study aims to describe the roles and functions these three plants have played in the past, present, and future within this community. It will also focus on plant restoration and the benefits of an increased number of native plant species within the ecosystems of the Muckleshoot plateau.

Student Researcher: Whitney Matthes (in collaboration Valerie Segrest)

1. I, _____ (interviewee's full name), state that I am over 18 years of age, and freely and voluntarily wish to participate in *The Relationship between plants and people* study. **2.** I am aware that I will have an opportunity to review, modify, and approve of any specific information I share with the interviewer. **3.** As Muckleshoot knowledge and praxis is collective knowledge, I am also aware that the final definition, use and disposition of any information I provide for this project will be subject to review and approval by the Muckleshoot Tribal Council before it can be fully articulated, given meaning and publically shared. **4**. A written copy of the Informed Consent Form has been given to me.

Benefits: The potential benefit of your participation will be in helping to culturally and biologically protect and perpetuate plants that have played a significant role in the lives of the Muckleshoot since time immemorial. With the knowledge and information you share you will be helping protect the lands of the Reservation and its animal and plant populations, as well as help develop a sustainable means of access to these plants for present and future generations. Community outreach programs will help

inform members of the community from any age group on how to tend these plants and their added benefits both physically and culturally.

Procedures: The nature of your participation will be that of an interviewee and/or guide to the research in participant-observations. In either instance, you will be asked to help provide your understanding of the significance relating to the historic and cultural meanings and uses of Camas, Chocolate Lily, and Balsam Root.

To help accomplish this research you will be asked a series of questions relating to the meanings and uses of various aspects of these three plants. The questions will occur in an informal interview situation and/or while you are engaged in some normal activity relating to your use of the watershed.

The duration of the interview will vary from an hour to two - three hours. Follow-up interviews maybe requested of you.

Risks: There are no reasonably foreseeable risks or discomforts associated with your participation in this research project, other than the possible length of the interview.

Although these three plants have historically been eaten in the past without adverse effects it is important to understand that other native plant species should be eaten with caution and an in depth understanding of plants should be developed prior to eating species unfamiliar to them. These risks will be minimized with the implementation of community outreach programs and classes that are geared toward an increased understand of the three plants included within this research project. There is also a possibility that eating some native plant species could have adverse effects in conjunction with some over the counter prescription medications. Though the three plants selected in this study have not had any documented cases of adverse reactions it is important for participants to understand that other plants not included within this study need to be discussed with a doctor prior to being incorporated into the diets of individuals who have medications they need to take for differing aliments.

Voluntary: As this is a voluntary project, you have the right not to participate in it or to withdraw from the project at any time, without plenty or consequences.

As a voluntary project, you have the right of confidentiality, i.e., your identity will not be revealed to anyone other than the project researcher(s) without your consent.

At the end of this form there is list of persons you can contact if you have any questions about this research, your rights, and any other research-related injury as a subject of this research.

I acknowledge that Valerie Segrest (cosponsor) and/or Whitney Matthes, student researcher, has fully explained to me the purposes and procedures, and the risks of this research; she has informed me that I may withdraw from participation at any time without prejudice; and has informed me that I will be given a copy of this consent form. I freely and voluntarily consent to my participation in the above mentioned research project.

_____I waive my right to confidentiality, i.e., my name may be used in the research.

_____I do not waive my right to confidentiality, i.e. my name may not be used in the research or disclosed to anyone other than the project researcher(s)

_____I give the student researcher to permission to use audio recording devices during the interview process

_____I do not give the student researcher permission to use audio recording devices during the interview process

Can the student researcher photograph or digitally record these interviews? Yes ____ No_____

If yes, can the researcher use these recordings in the final written and oral presentation of this project? Yes_____No_____

If you have a preference or stipulations on the use of the above interview techniques please list them in the section below.

List any special stipulations or conditions established by the interviewee in the conduct or disposition of this project, e.g., use of images or photographs, or specific information or identities:

_____
_____
_____

Signature of Interviewee: _____

Signature of Student Researcher: _____

Date: _____

For more information, contact:

Whitney Matthes, Student Researcher/

Graduate Student

University of Idaho

253-569-5174

whitneymatthes@gmail.com

Rodney Frey, Professor of Ethnography

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APPENDIX F: ***Plant Biographies***

Camas

Camassia quamash

What it looks like: Many who have seen fields of Camas in full bloom are taken aback from it sheer beauty as they gaze upon meadows of gently rolling blue hues. Blue Camas is a perennial herb with large bulbs that are similar in size to daffodils. The leaves of the plant are grass-like in appearance. The flowers of the camas are beautiful and range from hues of deep blue to light blue.

Where it grows: Camas has a very diverse habitat. It can grow in a number of different areas such as grassy meadows, bluffs, and often grow in moist or swampy fields. Camas thrives when it grows in areas that remain moist for a large part of the year but dry out by late spring. Camas thrives at low to mid-elevations in the mountains.

Part used: The bulb is predominantly used

Harvesting: After the plant has flowered, usually from May to early August, the bulbs can begin to be harvested. This time frame really depends on the elevation where the plant is growing.

Preparation: Baked in a pit or dried on mats

Traditional uses: Traditionally after the bulbs are gathered they are cleaned they are then steamed in pits for up to three days until the bulbs begin to get firm and blackened. Some people also dried the bulbs on mats, without cooking them as well. Blue Camas is also a great side with other plants like Black Tree Lichen, Bitter-root, and onions or meats such as salmon or deer.

Camas is also very high in inulin. Inulin is a complex sugar that emerges from the complex carbohydrates within camas once they are subjected to the high heat of the cooking pit or a convection oven. Unlike most sugars inulin is unique because it does not affect blood sugar levels when it enters the blood stream. The complex carbohydrate that is found within Camas needs special preparation to be digestible in order to avoid stomach pain it is important to cook the camas prior to eating it.

Warning: Care must be taken never to confuse the bulbs of Blue Camas with those of the closely related Death Camas (*Zigadenus venenosus).* Death Camas commonly grows together with Blue Camas, and the leaves are difficult to distinguish. Also, the bulbs are similar in size and shape. But Death Camas has cream-colored flowers that are smaller and in a tighter cluster than those of the two Blue Camas species. Anyone wishing to sample Blue Camas should dig them up at flowering time to avoid any possibility of misidentification.

References:

Burke Museum of Natural History and Culture- http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Camassia&Species=quamash

Food Plants of Interior First Peoples- Nancy J. Turner

Chocolate Lily

Fritillaria camschatcensis

What it looks like: Chocolate lily is a perennial forb that is a member of the lily family. It grows 8-24 inches tall and its leaves gather in groups of 5 to 9 down the stem. This plant flowers from May to July with beautiful flowers that are dark greenish brown to rich brownish purples. The flowers are sometimes spotted or streaked with green or yellow and usually bloom close together. The flower also has a bit of a foul scent. The bulbs themselves consist of several fleshy scales which disintegrate into numerous rice-like bulbets. These rice-like bulbets have earned this plant a few different names which include Wild Rice, Indian Rice, and Northern Rice Root.

Where it grows: Chocolate lily grows in moist tide flats, meadows, open forests, rocky beaches, and stream banks in the lowland to subalpine zones.

Part used: Bulbs

Harvesting: Chocolate lilies are traditionally harvested in the autumn months

Preparation: The bulbs of this plant are broken apart and then soaked in one or more containers of water to help remove their bitter taste. They are then boiled and eaten with oil or lard and are used in soups and in stews. Bulbs can also be dried and pounded into flour.

Traditional uses: Although the bulbs are very bitter, some people still collect them and eat them raw. The *Fritillaria* species are related to both onions and garlic. Bulbs of chocolate lilies are high in starch. Some groups dried the bulbs and used to them to make rice- like flour.

Chocolate lily has been known to appear in the gardens of Coast Salish first peoples. In some accounts of tribes in British Columbia beds of “Rice-Root” aka Chocolate lily were tilled,

tended, and in some cases owned by specific groups or families. This species is easily transplanted, and grows from bulbs or seeds. Once it is an established part of your garden it tends to spread in the garden. Chocolate lily also served as an important trade item in Coast Salish communities.

References:

Botanica North America- The Illustrated Guide to Our Native Plants, Their Botany, History, and the Way They Shaped Our World- Marjorie Harris

Keeping it Living- Traditions of Plant Use and Cultivation on the Northwest Coast of North America- Douglas Deur and Nancy J. Turner

USDA- Plant of the week- http://www.fs.fed.us/wildflowers/plant-of-the-week/fritillaria_camschatcensis.shtml

Puget Balsamroot

Balsamorhiza deltoidea

What it looks like: Balsamroot is a perennial plant with large tap roots. Its leaves are basal and are usually large and triangular in shape. Its flowers are large and yellow with sunflower-like heads. The stems of the plant are upright with a few smaller leaves growing from the stems.

Where it grows: Prairies and other open areas at low elevations, mostly in the Puget Sound trough.

Part used: The roots, young shoots, bud-stems, and seeds are all popular food items

Harvesting: In early spring, from March to April, as the Balsamroot leaves begin to show above the ground people begin to dig up the taproots of this plant. The taproot of this plant can grow as long as 30 cm but most people prefer harvesting the taproots when they are similar in size to carrots. Taproots can be harvested later in the summer into the month of August but the root becomes stringy and tough later in the summer. Succulent shoots can also be harvested from the Balsamroot which can be harvested before and after the taproots harvested.

Preparation: To prepare the taproots, a person should beat them to loosen the tough outer skin, and then peel them. Once peeled they traditionally baked the whitish inner part of the taproot overnight. Balsamroot is a very versatile plant and can also be dried or eaten immediately.

In April and May, when the flower buds are still slightly closed, people gathered the bud stems, peeled them, and ate them raw, steamed, or boiled. These buds are said to have a pleasant nutty taste, reminiscent of the smell of young sunflower seeds.

Traditional uses: Balsamroot contains Inulin, which is a complex sugar that is easily digestible and will not alter a person's blood sugar once it is ingested. Inulin emerges when a complex carbohydrate, like the ones found in Balsamroot, is cooked or pit-steamed.

The whitish succulent shoots that are associated with the plant are a common food source. They were eaten at times when foods were scarce or few other foods were available. The shoots were located from the dead leaves and flower stalks from of the previous years' growth, people would dig them up and eat them raw.

References:

E-Flora BC: Electronic Atlas of the Flora of British Columbia:
http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Balsamorhiza%20deltoidea

Burke Museum of Natural History and Culture:

http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Balsamorhiza&Species=deltoidea

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Food Plants of Interior First Peoples- Nancy J. Turner