

The *λ'aayas* Project:
Revitalizing Traditional Nuu-chah-nulth Root Gardens
in Ahousaht, British Columbia

by

Jennifer C. Pukonen
BSc, University of Victoria, 2001

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

MASTER OF SCIENCE

in the School of Environmental Studies

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The Nuu-chah-nulth and other First Nations of coastal British Columbia used to maintain gardens of indigenous plants with edible roots on their estuarine tidal flats. Tasty and nutritious, these roots were carefully tended and nurtured to enhance their productivity and quality. Within the last century, the Nuu-chah-nulth diet has changed significantly, and these indigenous root vegetables are not as well known. This community-based action research project (The *λ'aaya łas* Project) was suggested by members of the Nuu-chah-nulth communities of Clayoquot Sound, as a way of maintaining and strengthening traditional knowledge, cultural identity and ultimately, community health and well-being through renewal of awareness of these and other traditional foods. The *λ'aaya łas* project engaged students and community members of all ages in a diverse range of activities aimed at revitalizing the knowledge, skills and cultural practices involved in caring for traditional root gardens. These activities have included: hosting community steam-pit cooking events; learning from knowledgeable community members; re-creating a root garden in the community of Ahousaht; and implementing and observing the results of traditional management techniques on a root garden plot at the Atleo River estuary. This thesis documents the development of this community action research project and examines the role of ecocultural restoration projects in providing opportunities to strengthen and facilitate the connection of youth to their land and culture through experiential learning. Discussions incorporate a summary of feedback and reflections on the project, and of the revitalization of traditional

knowledge and practices locally, globally and in the future. In closing, I draw together thoughts and ideas from local community members and others who recognize and hope to revitalize the inextricable relationships between cultural and ecological health and diversity.

Key words: First Nations, Ahousaht, ethnobotany, ethnoecology, Clayoquot Sound, British Columbia, traditional food, root vegetables, ecocultural restoration.

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Preface

I feel so lucky to have had the opportunity to facilitate the *λ'aayas* Project, though I have definitely not developed this project alone. The stories and information shared in the following chapters reflect the knowledge and work of many people. This paper contains valuable information and ideas and this is not my information - it belongs to those who shared it with me. I will, however, take ownership over any mistakes or misinterpretations I may have incurred, as I'm sure there are some. The words I write reflect my values and thoughts and are simply my view of the experiences – the experts live in Ahousat. I draw some conclusions, and make some recommendations based on what I have learned, and it is with gratitude and humility that I present this thesis. It has been a real honour to learn and share with the community of Ahousaht, whose roots and relationships with this place go back millennia and I hope that the information I have gathered and compiled will provide a useful resource for the community of Ahousaht.

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Chapter 1 - Introduction

...The root garden research project is important... because, if successful, it will help to rebuild part of the strengths of ancient Ahousaht life ways. Traditional roots, which today have scientific Latin names, also have Nuu-chah-nulth names provided by Qua-ootz, Owner of all Reality, Creator of the universe, and they were gifts provided for the health and well-being of quus.

(Umeeek, Richard Atleo pers. comm. 2006)

1.1 Nuu-chah-nulth root gardens

The Nuu-chah-nulth and other First Nations communities of coastal British Columbia maintained gardens of plants with edible roots¹ on their estuarine tidal flats. These included: *kuuxwapiihmapt* (Northern riceroot - *Fritillaria camschatcensis*; Liliaceae), *tlicy'upmapt* (Pacific silverweed - *Argentina egedii* spp. *egedii*; Rosaceae) and *ʕaʕiic'uqmapt* (springbank clover – *Trifolium wormskioldii*; Fabaceae). (The edible parts are called: *kuuxwapiih*, *tlicy'up*, and *ʕaʕiic'u* respectively.). Tasty and nutritious, these root vegetables were often eaten in great quantities at feasts and at other times throughout the year. To produce the large amounts of roots required, the Nuu-chah-nulth would carefully tend their gardens, weeding out other plants, churning the soil with special digging sticks, and selectively harvesting and replanting rootlets for the next year's harvest (Turner 1995; Deur 2005; Turner and Peacock 2005). Like most Nuu-chah-nulth food practices, this type of gardening was sustainable in the long-term, producing an abundance of food without making a negative impact on the land.

More recently, the Nuu-chah-nulth, like people around the world, have experienced significant changes to their environment, lifestyle and diet, and these roots and their associated cultivation practices are no longer as well known today. Turner and Turner (2007:57) identify the following ten factors as influencing dietary change among Indigenous peoples of Western Canada: “loss of territory for accessing traditional food, loss of traditional management practices such as landscape burning, introduction of new

¹ The root vegetables actually include clover rhizomes, silverweed roots and rice root bulbs. However, for convenience “roots” will be used in reference to both true roots and other underground parts.

foods, land degradation and transformation, barriers to intergenerational knowledge transfer, colonial policies privileging agriculture, regulations against indigenous cultural practices; and globalization and domination of mainstream food systems.” The significant changes to the diet that have occurred as a result of these influences, have in turn placed the knowledge and use of traditional foods at risk.

Although the Nuu-chah-nulth, and other coastal First Nations still rely heavily on fish and seafood, their use of traditional plant foods, including berries, and especially wild green vegetables and root vegetables, has declined (Trudy Frank pers. comm. 2006; Turner 1995). So too, has the knowledge about how these resources are harvested, processed, stored, served and sustained. In the past, knowledge and use of wild plant foods was devalued, and the habitats where these resources have occurred (e.g. river estuaries) have been degraded by industrial activities (e.g. log dumps, roads). As a result of these changes, there are now many First Nations elders and community members who worry that children and youth are not learning the knowledge, skills, language and cultural practices of their ancestors. They “...believe, that their children and youth need this knowledge for their long-term survival and as part of their cultural identity” (Turner and Wilson 2005:114; Parrish *et al.* 2007). For this reason, elders and leaders in several Indigenous communities, including hereditary Ahousaht Chief *Umeek*, Dr. Richard Atleo, have expressed a desire to restore and revitalize their food traditions.

1.2 The roots of this study

The purpose of this study was to create an opportunity for interested students and community members in Ahousaht to learn about an important Ahousaht food tradition, through participating in the research into and re-creation of a traditional Nuu-chah-nulth root garden. This research project was suggested by members of the Nuu-chah-nulth communities of Clayoquot Sound, Vancouver Island as a way of maintaining and strengthening traditional knowledge, cultural identity and ultimately, community health and well-being through renewal of awareness of these and other traditional foods. The project followed a community-based participatory action research (PAR) framework in which community members guided all stages of the project’s development. My thesis documents the development of this ecocultural restoration project and assesses the effectiveness of the project to revitalize and renew awareness of a traditional food

practice for nutritional and cultural benefit in a Nuu-chah-nulth community. We hope that through sharing our experiences and the lessons we learned along the way, we will help to inspire and support other community-based rediscovery and revitalization projects.

This chapter provides information on the background and context for this project including an introduction to the culture and environments of the Ahousaht First Nation, local conflicts surrounding contemporary resource management practices, ecocultural restoration, participatory action research and some of the key stages in the development of the project. In addition, this chapter provides the specific research questions and objectives of this research and an outline of this thesis.

1.3 Ahousaht First Nation

The Ahousaht Nation is one of the five central region Nuu-chah-nulth First Nations of the west coast of Vancouver Island. The community of Ahousat² is located on the sheltered east side of Flores Island, in Clayoquot Sound, and is accessible only by boat or float plane.

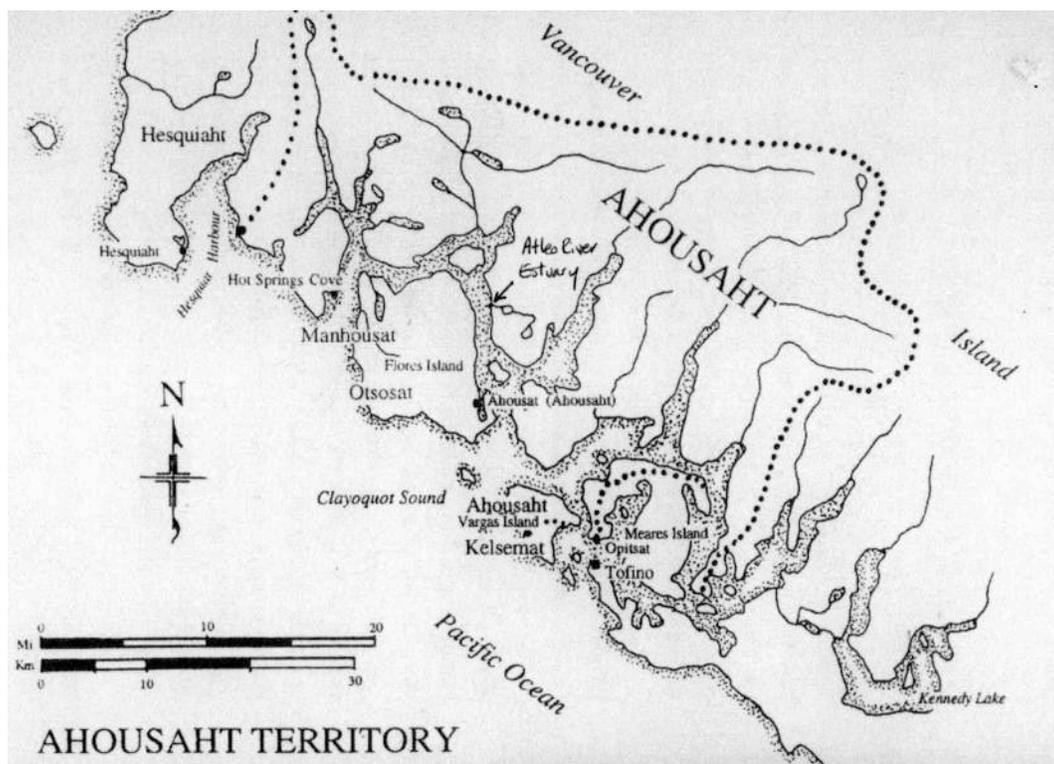


Figure 1.1 Ahousaht Traditional Territory (Robert Turner *From:* George 2003:22)

² It has been explained to me that when Ahousaht is spelled with an 'aht' at the end it refers to the people of Ahousat – the place, which is spelled without the 'h'.

Elder and historian Stanley Sam explains the origin of the term ‘Ahousaht’:

The name ‘Ahousaht’ (pronounced ‘a-howze-at’) is an anglicization of the Native term 7aahuus7ath, ‘people of 7aahuus.’ The word 7aahuus is the name of a former summer village of the Ahousaht Nation located on Ahous Point on the southwestern side of Vargas Island (Sam 1997:26).

The village of Ahousat is also referred to as ‘Marktosis,’ an anglicization of *maaqtusiis*, which means ‘moving from one side to another,’ which some say is in reference to this move from Vargas to Flores Island (Sam 1997). Over the years several local Nuu-chah-nulth groups, including the Manhousaht and Keltsomaht, Quatsweaht and Owinmitisaht, amalgamated to form the present Ahousaht First Nation (Sam 1997). Today, the Ahousaht First Nation has an estimated population of 1,700 (Ahousaht 2007), with approximately 700 members living year round in the community of Ahousat, and others residing in Port Alberni, Nanaimo, Victoria and elsewhere. The population of Ahousat has been growing significantly in recent years. To meet the needs of the community members the village has its own elementary and high-school, along with a community hall, health centre, youth centre, restaurant, gymnasium, soccer field and other facilities.



Figure 1.2 Ahousat gymnasium and school³

³ Unless otherwise indicated, photos displayed in this thesis were taken by the author.



Figure 1.3: Ahousat harbour

The village of Ahousat is located within an incredibly rich and diverse ecosystem. The surrounding terrestrial area includes coastal temperate rainforest, extensive bogs, marshes, meadows, lakes, rivers, streams and alpine peaks. The marine ecosystems include a diverse array of habitats from calm estuaries, mudflats and shallow banks to sandy beaches, exposed rocky shorelines and reefs to the open Pacific Ocean. Together these habitats are home to an abundance of both terrestrial and marine species. This diverse landscape has supported the Ahousaht people and their lifestyle for many generations.

The contemporary Ahousaht economy has been focused on traditional activities as well as commercial fishing and to a lesser extent tourism, logging, aquaculture and other occupations. In the early 1990s fishing represented 73% of Nuuchahnulth employment (Vodden and Kuecks 2003). However, recent changes have led to significant employment loss in the fishery. Today, community members are also employed seasonally in silviculture, water taxi transport, construction and aquaculture. The Ahousaht First Nation employs people in a number of departments including administration, education, human services, a medical clinic, social services, home care, transportation, maintenance, fisheries and forestry. In addition there are several locally owned businesses in the

community including a restaurant, water taxis, independent artists, contractors and professional services (Vodden and Kuecks 2003). Despite official census figures of 16-19% unemployment, locals report unemployment rates as much higher and consider this issue a serious concern. The growing population and increasing number of members who live away from the community and would like to return home is creating significant pressure for job creation, education and training (Vodden and Kuecks 2003).

The Ahousaht have experienced tremendous changes in their lives over the past hundred years due to colonial influences, the constraints of the Indian Act, conversion to the wage economy, the residential school system and other pressures (George 2003; SP 1995a). However, despite these changes and the many challenges that have arisen as a result of them, the Ahousaht are working to overcome these troubles, and are focusing on renewing the health and well-being of their communities and environment, by drawing on the strengths and wisdom of their cultural traditions.

1.3.1 The Ahousaht language

The Ahousaht speak a variation or dialect of the Nuu-chah-nulth language. A dialect is generally “defined as a form of speech used in a particular area, and is a variety of a language, generally based in local geography, that used non-standard vocabulary, pronunciation, or grammar” (Barkley Sound Dialect Working Group 2004:23). The Nuu-chah-nulth Language is part of the Wakashan language family and embraces a number of different dialects, within two closely related language groupings (Ditidaht and Nuu-chah-nulth). Although there are some sounds that are the same as in English, there are many that are not. Over the years, people have developed a number of different ways of writing this complex language. In the 1970’s, the International Phonetic Alphabet (IPA) writing system was adopted by the Nuu-chah-nulth Tribal Council (except by Kyuquot) (Barkley Sound Dialect Working Group 2004). As this alphabet is a preferred way of writing the language for many of the communities and especially the schools, I use it here in my thesis for reporting the Nuu-chah-nulth words. Any additional orthographies from other sources are used in quotations, in order to avoid mistakes in translation.

1.4 Context for research and restoration in Clayoquot Sound

Clayoquot Sound has been home to the Nuu-chah-nulth for millennia. Yet, despite their long history and relationship with the environment, until fairly recently Nuu-chah-nulth values and perspectives have been given little or no attention in contemporary resource management practices (Scientific Panel 1995a; Craig 1998). As a result, industrial activities such as logging have damaged their local environments and affected, among other things, the plants the Nuu-chah-nulth have used, and continue to use, for foods, materials and other purposes (Craig and Smith 1997).

However, this situation started to change in the early eighties, when local First Nations and Tofino residents organized one of the first logging blockades in Canadian history to publicly oppose the proposed clear-cutting of Meares Island, which lies in the heart of Nuu-chah-nulth traditional territory. At this time, the Nuu-chah-nulth, who had begun to negotiate a territorial treaty with the Canadian Government, sought a court injunction to protect Meares. The B.C. Supreme Court granted the injunction and agreed to halt logging pending the outcome of treaty negotiations, which remain unresolved to this day (Ecotrust 2007).

This conflict was only the beginning. In 1993, the B.C. Government released a Land Use Decision for Clayoquot Sound, which along with other things, designated areas for protection and areas for logging. Many groups were greatly dissatisfied with the government decision, especially the First Nations who felt that the decision had been made with little to no consultation and did not respect Nuu-chah-nulth values, rights or perspectives. The “Clayoquot Sound decision” led to one of the largest actions of civil disobedience in Canadian history and as a result, Clayoquot Sound became internationally recognized for conflicts over unsustainable forest practices.

In response to recommendations made by the Commission on Resources and Environment and the significant public pressure that arose after the protests, the BC government established the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, an independent panel of Nuu-chah-nulth elders, cultural specialists, and scientists to review industrial forest practices in Clayoquot Sound (Scientific Panel 1995a; Scientific Panel 1995c). As a result of this process, the Panel developed a number of

recommendations for sustainable local resource management. Included in their findings was the recommendation that traditional sites that have been altered or degraded by logging practices should be restored and all phases of restoration activities in damaged Clayoquot Sound ecosystems must be undertaken in full consultation and with active participation of the Nuu-chah-nulth of Clayoquot Sound (Scientific Panel 1995c). The importance of engaging local people in research and restoration efforts on their traditional territories has been widely recognized (Beckwith 2005, Scientific Panel 1995c, Higgs 2003; Senos et al. 2006). Recommendations similar to those of the Scientific Panel have been expressed in international agreements such as the Convention on Biological Diversity, which recognizes that:

...the first beneficiaries of the conservation and sustainable use of wild plants and animals should be the rural communities and indigenous peoples, whose traditional knowledge and respect have conserved these resources for centuries.
(Scientific Panel 1995c:12)

And, Agenda 21, which seeks to provide a framework for sustainable development and recognizes that

...traditional direct dependence on renewable resources and ecosystems, including sustainable harvesting, continues to be essential to the cultural, economic and physical well-being of Indigenous people and their communities
(United Nations 1992: Section 26.3)

First Nations and other local communities in Clayoquot Sound continue to seek ways to build bridges and develop new models for sustainable development and conservation that are guided by Nuu-chah-nulth knowledge and principles (Clayoquot Biosphere Trust 2007). Some of these initiatives have included entering into treaty negotiations, the development of a series of Interim Measures Agreements, establishing the Central Region Board and the Clayoquot Sound Scientific Panel and, later, designating Clayoquot Sound as a UNESCO Biosphere Reserve. A common theme among these initiatives is recognition of the important and critical role of Nuu-chah-nulth knowledge, perspectives and participation in the management of their traditional territories.

The previously mentioned story of local First Nations and non-Indigenous communities standing up for an issue that affected them is not an isolated account. Paul Hawken, author of *Blessed Unrest: How the Largest Movement in the World Came into Being and Why No One Saw It Coming*, believes that there are now more than one million – and possibly even two million - organizations working on an international movement toward ecological sustainability and social justice (Hawken 2007). Hawken describes how global issues such as poverty, ecological degradation, global climate change, terrorism, polarization of income, loss of culture, and many more, have linked disparate social justice, indigenous rights, and environmental groups worldwide. Further, he explains that, “Even though the origins and purposes of the various groups comprising the movement are diverse, if you survey their principles, mission statements, or values, you find they do not conflict... What its members do share is a basic set of fundamental understandings about the earth, how it functions, and the necessity of fairness and equity for all people dependent on the planet's life-giving systems" (Hawken 2007:np). As such, this local research project is but one small piece of a much larger global set of initiatives.

1.4.1 Ecocultural restoration

Over many generations, local and indigenous peoples from around the world have developed a vast array of techniques and approaches to sustainably use and care for their traditional territories (Turner and Berkes 2006). Unfortunately, many ecosystems that were once managed by local and indigenous peoples are now highly constrained and degraded as a result of industrial and urban development. In many cases, community members say that traditional plant foods and medicines, for example, are becoming harder to find (Craig and Smith 1997). Along with this loss of biodiversity, perhaps even more serious, is the loss of the cultural knowledge relating to the sustainable production, harvesting, processing and use of the food and medicines – the knowledge that has sustained generations of people in their home territories for thousands of years (Turner 2005; Deur and Turner 2005).

Today, however, there is an increasing recognition of the inextricable links between ecological and cultural diversity. Dennis Martinez, Chair of the Indigenous Peoples Restoration Network, explains that, “locally adapted cultural diversity goes hand

in hand with biological diversity... Together they constitute ecocultural diversity” (Martinez 2006; Senos et al. 2006). Therefore, if biological diversity is threatened then so too is cultural diversity, and vice versa.

“Ecocultural restoration” is a term that has been used to describe the process of restoring not only an ecosystem but also the cultural knowledge, skills and practices that have played a role in shaping that system for generations. The term “ethnoecological restoration” also recognizes the need to integrate both cultural practice and ecological processes in restoration (School of Environmental Studies 2008). In discussing ecocultural diversity and the relationships between ecological restoration and indigenous cultural survival, Martinez (2006) declares that, “what we are really restoring is our relationship with the places we live in and depend on.”

In the past, ecological restoration efforts have been largely dominated by western science and in many cases restoration goals were based solely on the idea of a ‘natural’ or ‘pristine’ environment, with the assumption that First Peoples did not play a role in shaping these environments. Increasingly it is being recognized that the ‘pristine’ environments, which early explorers first encountered here on the West Coast for example, were in fact the result of careful stewardship and management by the First Nations (Deur and Turner 2005). Embedded in these local knowledge and management systems are important lessons that can contribute to helping us all to live more sustainably (Turner 2004). Many people suggest that today’s restoration efforts should be led by and involve local peoples and should both respect and facilitate traditional resource management techniques (Beckwith 2005, Higgs 2003; Martinez 2006; Senos et al. 2006). In his book *Nature by Design*, Higgs (2003) examines current ecological restoration practices and discusses how re-establishing human relationships with the land being restored is critical for future environmental sustainability. He introduces the term ‘focal restoration’ in reference to restoration projects that engage community participation and maintains that for restoration efforts to be truly successful, they must involve people at the community level. Higgs suggests that these ‘focal restorations’ can help to bring communities together and help participants to develop a sense of place (Higgs 2003).

Yet, another fundamental reason for the integration of local people and

knowledge systems is that the “application of scientific research and local knowledge contributes both to the equity, opportunity, security and empowerment of local communities... and equity of knowledge also provides opportunity for local people to participate in the management of local affairs with global implications” (Narayan 1999: np). Different knowledge systems provide diverse ways of looking at and understanding the world around us. As Richard Atleo explained to Craig in *Nature was the Provider* (1998:20):

I have consistently maintained that the two systems [conventional science and traditional ecological knowledge] can complement one another... the strength of science, conventional science, has been the less human you make it, the better it is.... And so from that perspective then, people in that tradition, who live in that tradition require humanization which the other process can bring.

Jesse Ford and Dennis Martinez (2000:2) echo this sentiment:

We believe that as a community of ecologists living in times of unprecedented ecological change, we can no longer afford the questionable luxury of working solely within our own traditions if we are to learn to live sustainably. Conserving our options means, in part, conserving the diversity of ways of thinking about problems.

Integrating traditional knowledge systems and western science can not only help us to protect remaining intact ecosystems, but can also be used to guide restoration of those that have been damaged.

In *Cultural and Spiritual Values of Biodiversity*, Posey (1999), clarifies that when discussing traditional knowledge and practices, it is also important not to allow “traditional” to be used to restrict local innovation and cultural change. In 1996, the Four Directions Council of Canada (Posey 1999:4) provided the following definition:

What is ‘traditional’ about traditional knowledge is not its antiquity, but the way it is acquired and used. In other words, the social process of learning and sharing knowledge, which is unique to each indigenous culture, lies at the very heart of its traditionality.

However, the important task for academics and community members alike, is not to debate over what is traditional, but instead to rekindle and enhance the spiritual and cultural values that cultures have used effectively to conserve biodiversity for millennia (Posey 1999; Turner and Berkes 2006). Academics can assist local communities by listening to their concerns and interests, and if there is the desire within the communities, by collaboratively identifying and supporting initiatives that may address these issues.

1.4.2 Community-based participatory action research

As a non-indigenous researcher coming from outside the community, it was not only important, but essential, for me to use a research methodology that would be respectful, culturally appropriate and mutually beneficial. Community-based participatory action research (PAR) has provided me with a valuable framework in which to work.

Community-based participatory action research is seen not only as a process of creating knowledge, but simultaneously, as education and development for action (Gaventa 1988:19). It engages researchers and community members in collaboratively identifying and investigating a problem with the ultimate goal of taking action to improve local conditions (Gaventa 1988). Ideally, the process creates changes that stem from the community and empower the community members to be actively involved in solutions. This approach acknowledges the importance of youth, elders and others in the community having a voice in defining their local projects. In addition, it recognizes and respects that community members of all ages have different kinds of expertise and frames of reference, which are both complementary and essential to the research process. For this reason, participants are actively involved in all stages, from the design of the study, to the collection and analysis of data, and eventually in the dissemination of results.

A study by Suzanne Batten (2001), from the Dene Nation, illuminates some of the ethical benefits of doing research in an Aboriginal community from a participatory action research (PAR) framework. She found that using the PAR framework “...created a catalyst for change in the participants in a variety of areas which included: self-efficacy,

career possibility, identity renewal, and a return of power and control to the community in the research context” (Batten 2001:112).

As mentioned above, when following a community-based participatory action research approach the process is as important as the final product.

1.5 Developing the λ'aayaʕas project

It has been absolutely essential to have the guidance and advice of Hereditary Ahousaht Chief *Umeeek*, Richard Atleo throughout the development of this project. In addition to having *Umeeek's* permission to work within his traditional territory, it was also important to obtain formal permission to work with the community from the elected Ahousaht Chief and Council. Prior to initiating the project I provided the Council with letters of information about the project and asking for any guidance or suggestions that they might have. I had an opportunity early in the project's development to meet with Chief Councilor Keith Atleo and Council Member Roman Frank, and they provided some extremely helpful ideas and suggestions. In addition, I offered to make a presentation about the proposed project at one of the Ahousaht Council meetings. The Council was quite busy at the time, however, and after some correspondence, it was suggested to me that considering Richard's involvement in the project, such a presentation at that time would not be necessary and the Council approved the project on the basis of *Umeeek's* recommendation and the written proposal.

Before beginning the implementation of the project, I also sought and received permission from the University of Victoria's Human Research Ethics Board (HREB) (see Appendix A: HREB Certificate of Approval). After receiving the letter of approval from Chief and Council, and the HREB I started to seek ideas and suggestions from the community and to apply for funding to support and enact these ideas. In addition to following advice and suggestions offered to me by Ahousaht Community members, I also followed the research protocols outlined by the University of Victoria Human Research Ethics Board (HREB) and in the *Standard of Conduct for Research in Northern Barkley and Clayoquot Sound Communities* developed through the Protocols Project of the Clayoquot Alliance for Research, Education and Training (CLARET 2003). More

detailed descriptions of the development of the different aspects of the project are provided in the following chapters.

1.6 Thesis objectives

The overarching goal of this research project was to revitalize a traditional Nuu-chah-nulth root garden as a way of promoting and maintaining important traditional knowledge, strong cultural identity and community health and well-being. Specifically, this thesis documents the development of the project and assesses the following central research question: Can a community-based ecocultural restoration project, provide an effective and meaningful way to revitalize and renew awareness of a traditional food practice for nutritional and cultural benefit in a Nuu-chah-nulth community?” Further, through a preliminary field experiment, I investigated a secondary research question “What effects do traditional management practices have on the productivity of estuarine root vegetables?”

As the project was quite diverse in scope, there were also a number of more specific objectives. These include the following:

- Engage interested students and community members in Ahousat in the research and re-creation of a traditional Nuu-chah-nulth root garden;
- Develop a community-based ecocultural restoration project, which incorporates both traditional ecological knowledge and scientific research techniques in a respectful and mutually beneficial way;
- Compile and make accessible information about Nuu-chah-nulth root gardens within the community of Ahousat;
- Raise awareness and understanding of these culturally and ecologically important food plant species;
- Generate scientific observations that complement existing traditional ecological knowledge about environmental management; and
- Contribute to a greater understanding of Nuu-chah-nulth estuarine root gardens.

1.6.1 Framework of Thesis

In this first chapter, I have provided introductory information and background for my thesis, which has involved working in partnership with the community of Ahousaht to revitalize and raise awareness of the knowledge and practice associated with traditional root gardens and documenting all of the stages of the project's development.

Chapter two provides an introduction and overview of the history of maintaining traditional Nuu-chah-nulth root gardens.

Chapter three outlines the different stages and development of the *λ'aaya ʕas* Project – re-creating a root garden in the community of Ahousaht together with all of the associated activities that were undertaken.

Chapter four describes our experiences tending to and monitoring the effects of traditional management techniques on a re-created garden plot at the Atleo River estuary.

In the final chapter, I present and discuss community feedback about the project and address the question of whether the *λ'aaya ʕas* project is effective as a case study and as an activity that helps to revitalize and raise awareness about this important cultural tradition and food production system. In closing, I summarize my findings and discuss how raising awareness about these food traditions through research, education and restoration projects may lead to a greater understanding and appreciation of traditional knowledge and lifestyles for people of all ages from both First Nations and non-Indigenous communities.

Chapter 2: Nuu-chah-nulth root gardens: history of use and importance

In the early days...people had ownership to some of these things [root gardens etc.] even though it was out in the wild, they worked at it, they did some work to enhance it... a lot of that is gone now, but it's good to have an awareness that it's there, still there...

Dave Frank (pers. comm. 2007)

2.1 Introduction

As described briefly in Chapter One, in earlier times, the Nuu-chah-nulth maintained and cared for gardens of plants with edible roots on their *hahuuli* tidal flats. They valued these root vegetables highly as an important food source, and often ate them in large quantities at feasts, as well as for everyday meals (Drucker 1951; Curtis 1916). To produce enough of these roots to feed the communities, the Nuu-chah-nulth and other Northwest Coast peoples developed a variety of techniques and strategies to sustain and enhance the productivity of these naturally occurring root vegetables and their associated habitats (Deur and Turner 2005). Like most Nuu-chah-nulth food management practices, this type of gardening was sustainable, producing an abundance of food without negatively impacting the land and its productivity. Embodied in this traditional resource use and management system were philosophies of caring and respect, which led to responsible land ethics and as a result, sustainable land use (Turner 2001; Peacock and Turner 2005; Turner and Berkes 2006).

Although there are written references to these estuarine gardens on the Northwest Coast, with the exception of Deur's writings, particularly his dissertation (2000) - *A Domesticated Landscape: Native American Plant Cultivation on the Northwest Coast of North America*, there are very few resources that focus specifically on Nuu-chah-nulth root gardens. Much of what has been written is not readily available in Ahousat or other Nuu-chah-nulth communities. This chapter offers a brief overview of the knowledge and practice of tending these gardens. It highlights and focuses specifically on Nuu-chah-nulth root gardens, for the benefit of Ahousat and other Nuu-chah-nulth communities. It will hopefully inspire people to learn more and to continue to rebuild and renew this important historical tradition.

In this chapter I also highlight some of the Nuu-chah-nulth philosophies and concepts that have guided people's resource use, discuss the role of indigenous roots in traditional food systems, and provide a description of traditional root gardens and the various strategies and techniques employed in their management. I discuss how the tremendous knowledge and understanding about traditional root gardens reflected in the practices around them are not only worthy of respect and recognition, but also have implications for both current and future resource use and management.

2.2 Methods

My research reflects a combination of information and insights from literature sources, from in-depth interviews and ongoing conversations with knowledgeable Ahousaht elders as well as from informal discussions with numerous other community members. Because few people today have direct memories or experiences with traditional root gardens, literature sources were necessary to gain information about these gardens. However, it is important to recognize that many early accounts of indigenous plant use were by non-indigenous explorers, settlers and anthropologists. As a result, these accounts were often superficial and based on brief encounters and culturally biased expectations. As Deur and Turner note in 'Reassessing Indigenous Resource Management, Reassessing the History of an Idea' (Deur and Turner 2005), misrepresentation and misunderstandings of indigenous plant use in early written accounts are common, and often the importance of plant resources is overlooked. That said, some of the information provided in early accounts has been re-evaluated by Indigenous elders and scholars and has provided valuable details and insights that have helped to build on a better understanding of First Nations resource management.

My interviews were with Ahousaht elders who were interested in sharing and describing their knowledge of traditional estuarine root gardens or other food production systems and/or their ideas and suggestions for the project. As explained in Chapter One, prior to beginning the implementation of the project, I sought and received permission from the University of Victoria's Human Research Ethics Board. Over the course of the project six Ahousaht youth worked as research assistants and were involved with helping to conduct the interviews, along with many other activities related to the development of

the root garden project (for more information on the research assistants see Chapter 3). Before conducting any interviews, the Ahousaht students and I explained the purpose of the study, the format of the interview, the issues and options for maintaining anonymity and confidentiality, the potential risks and benefits of participating in the research and the process by which participants can choose to withdraw at any time. All of the participants signed a consent form (see Appendix A) to acknowledge their understanding of and participation in the study.

The main purpose of the interviews was to gain an understanding of traditional root gardens, and to gather ideas, suggestions and feedback about the *λ'aayaʕas* Project (explained in more detail in Chapter 3). The structure used for the interviews was an in-depth guided approach in which discussion of the topics was prompted by open-ended questions such as, "Are you familiar with Ahousaht root gardens?" This technique provided more focus than a conversational approach, ensuring that the same general areas of information were covered in each interview but still allowing freedom and adaptability for the interviewees to include any of their own perspectives that they felt might be relevant. This open-ended interviewing approach allowed people to share stories about plant management and use, but also about other relevant and important aspects of Ahousaht culture and history. Sample interview questions are included in Appendix C.

The primary participants were contacted initially through my research advisor Dr. Richard Atleo, hereditary Chief of the Ahousaht First Nation, as well as through the "snowball method" in which participants suggested other people in the community who might be willing to be interviewed or to provide guidance and suggestions for the project. When possible, we had two or more interviewers present at each interview – myself and one or more of the Ahousaht research assistants. In addition to the in-depth interviews that we conducted, we also learned a great deal through informal comments and suggestions that were provided by community members throughout the duration of the project.

The interviews were transcribed and each transcript was given back to the interviewee, who was asked to review it, to delete any private or confidential information and make any corrections or additions as they wished. In addition, participants received pictures from their involvement in the project, along with a consent form, which

explained possible uses of the information and photographs (i.e., in preparing this thesis, in conference presentations, and other venues). This process ensured that the interviewees maintained control of their own knowledge. This chapter combines the information that was shared with us when talking to Ahousaht community members along with information gathered from other sources to provide an introduction and overview of the knowledge and practices associated with traditional Nuu-chah-nulth root gardens.

2.3 Nuu-chah-nulth environments and cultures

Nuu-chah-nulth elder, Nelson Keitlah, translates Nuu-chah-nulth to mean “all along the mountains and sea,” in reference to their traditional territory (NTC 2006). The term 'Nuu-chah-nulth' was adopted by the Nuu-chah-nulth Tribal Council in 1978 and is used to describe fourteen separate but related Nations whose *ḥahuuli* (chiefly territories) extends along the central west coast of Vancouver Island, from Brooks Peninsula in the north to Point-no-Point in the south. The inland boundaries of Nuu-chah-nulth territories generally follow the height of land along the watersheds dividing Vancouver Island, and the extent of the *ḥahuuli* reaches far out to the offshore fishing grounds all along the coast (George 2003; Scientific Panel 1995a; WCVIAMB 2006).

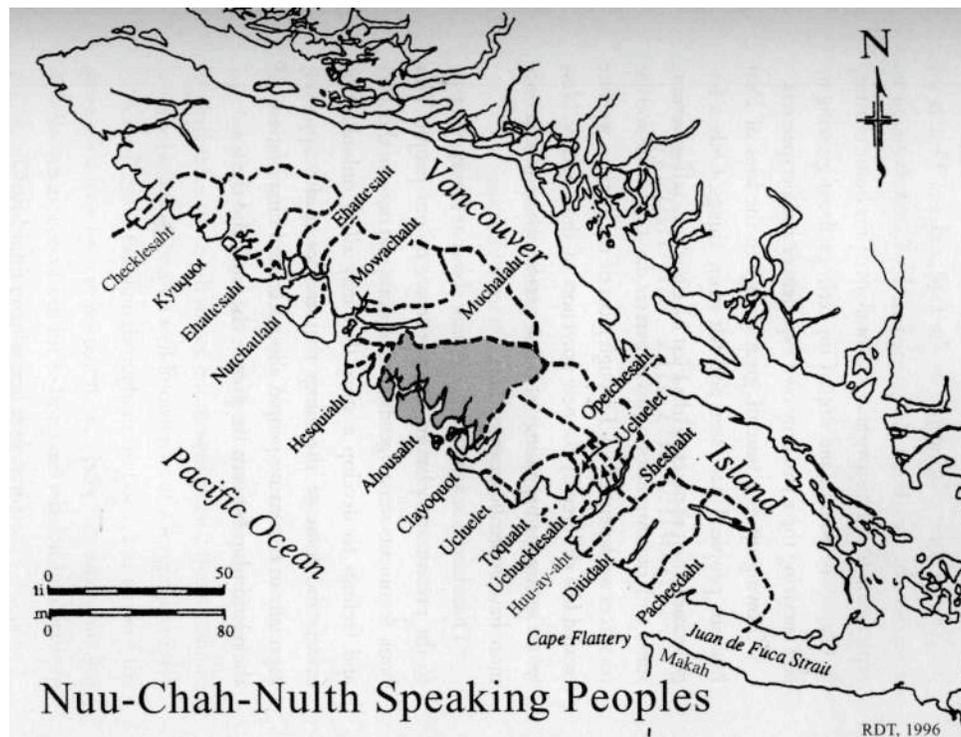


Figure 2.1: Nuu-chah-nulth territory (Robert Turner *From*: George 2003:13)

The region encompasses flat coastal plains and steep mountains and is characterized by a relatively mild climate, abundant rainfall, temperate rainforests and rich marine life. Like the rest of B.C, the coastline here is very convoluted with many long inlets, fjords and islands.



Figure 2.2: Clayoquot Sound (Stuart May 2007)

Nuu-chah-nulth culture is inextricably linked to the marine and terrestrial resources of the region, and is centered on the unique relationships between the Nuuchah-nulth and their natural environment. Like other Northwest Coast peoples, the Nuuchah-nulth are often associated with a marine-oriented lifestyle of “fishing, shellfish gathering and hunting marine mammals,” but it is important to note that plants were integral to people’s nutrition, cultures and daily lives (Pojar and MacKinnon 1994:24). Over thousands of years of careful observation and use of plant and animal resources the Nuuchah-nulth developed an intimate and detailed knowledge of their environment. A great diversity of berries, roots, and green plants were used to supplement diets that were rich in fish, shellfish and game (Kuhnlein and Turner 1991). And, countless other species of plants have been used by the Nuuchah-nulth for food, medicinal, spiritual, economic and technological purposes. The Nuuchah-nulth have names for over 150 species of

plants that have been used for food, materials, and other purposes (Scientific Panel 1995b).

“Although Nuu-chah-nulth people of the past shared traditions, languages and many aspects of culture, they were divided into chiefly families, local groups and, later, into Nations. Each Nation included several local groups, each centred around a *ha'wilth* (hereditary chief), and each living from the resources provided within their *ha'houlthee* (chiefly territories)” (NTC 2007). The seasonal availability of both plant and animal resources throughout the territory required people to move from their winter villages, where they had large multi-family cedar plank dwellings, to summer villages and seasonal camps (Sam 1997).

Over the past century there have been dramatic changes to the traditional Nuu-chah-nulth way of life. Today, most people live contemporary lifestyles in modern villages or urban centres. Though many changes in peoples' lifeways have been positive, many others have not, and have resulted in a number of major problems impacting health and well-being, which are of great concern to community members and leaders (Richard Atleo pers. comm. 2005; Mihesuah 2005). However, despite these challenges Nuu-chah-nulth culture remains vibrant and alive. Along with First Nations across the province, the Nuu-chah-nulth are experiencing a cultural renaissance and many people are focusing on renewing the health and well-being of their communities and environment, drawing on the strengths and wisdom of their cultural traditions.

Despite the similarities among the communities and ecosystems within Nuu-chah-nulth territory, there exists significant environmental and cultural diversity. Although I will often refer to Nuu-chah-nulth root gardens, it is important to recognize that specific management practices and traditions vary among the different groups within the Nuu-chah-nulth depending on both environmental and cultural factors. As this project has been developed in partnership with the Ahousaht, of the central region Nuu-chah-nulth, whenever possible, I will refer specifically to Ahousaht management practices.

An overview of Nuu-chah-nulth root gardens

2.4.1 “Roots” as part of a healthy traditional food system

Many generations of Nuu-chah-nulth people have relied on their local resources to provide a healthy and sustaining diet. Root vegetables growing in tidal flats and at river estuaries were an important part of that traditional diet. These included: kuuxwapiihmapt (riceroot), tlicy’upmapt (Pacific silverweed) and ʔaʔiic’uqmapt (springbank clover). Tasty and nutritious, these roots were carefully tended and nurtured to make them as productive as possible. Although Drucker (1951) estimated that the Nuu-chah-nulth may have only eaten a dozen or two meals of ‘the roots’ each year, the late Ida Jones of Port Renfrew recalled that at least some root foods were eaten several times per week throughout most of the year, and clover and silverweed were the major roots that were used (Turner and Kuhnlein 1982:427). These root vegetables, along with other plant foods, “contributed both diversity and essential nutrients, supplementing the fish, seafood, birds and game that made up the bulk of most meals” (Pojar and Mackinnon 1994: 24).

Table 2.1 shows the diversity of edible roots and other plant foods in traditional Indigenous diets across Canada. Nutritionists and ethnobotanists estimate that the First Nations of the Northwest Coast alone used more than 25 different species of wild roots (Health Canada 1994; Turner 1995).

Table 2.1: Plant food categories in the traditional diets of Indigenous Peoples of Canada and neighboring areas (*From: Kuhnlein and Turner 1991:10*).

Plant Food Category	Approximate Number of Species
Inner bark, cambium and sap	35
Flowers	30
Roots (roots, bulbs, tubers, corms, rhizomes)	125
Greens (stems, leaves, buds, shoots, etc.)	125
Seeds, nuts and grains	50
Fleshy fruits (berries, drupes, pomes etc.)	145
Sweetening agents	20
Beverages (teas and juices)	60
<u>Miscellaneous flavorings, casual edibles and chewing gums</u>	<u>90</u>
TOTAL	680

More recently, the diets of Nuu-chah-nulth and other Indigenous peoples across the country have changed significantly, and native root vegetables are little known today except by the oldest generations. Yet these plants are still growing, and still have the potential to provide nutritious food.

2.4.2 Root gardens for nutrition and food security

Although dietary change is common around the world, the rate and extent of such change varies significantly. For numerous reasons, the Nuu-chah-nulth diet and that of Indigenous Peoples across Canada and elsewhere in the world has changed quite drastically in the past century – in a phenomenon that some authors have termed the “nutrition transition” – and as a result their food sovereignty and food security has been undermined (Kuhnlein *et al.* 2006; Turner and Turner in press). Food sovereignty is defined as the ability to make substantive choices about food consumption, including what types of foods are eaten, and where, how, and by whom they are produced (World Food Summit 1996). Food security has been defined as existing when all people, at all times, have physical and economic access to safe and nutritious food, which meets dietary needs and food preferences, in sufficient quantity to sustain an active and healthy lifestyle (World Food Summit 1996).

Today, many traditional Nuu-chah-nulth foods are becoming harder to access. Community members have voiced concerns that some resources are no longer as plentiful as they were in the past, and that others are of inferior quality. Furthermore, a combination of factors such as the loss of time and opportunity for traditional practices due to participation in the wage economy, loss of access to traditional resources, contamination of traditional resources and resource sites, increasing urbanization, restrictions and regulations surrounding traditional harvesting and management practices, and most recently, forces of globalization and industrialization have all forced people to look for alternatives to traditional diets (Health Canada 1994; Turner and Turner in press).

For many people the greater availability of ‘store bought’ foods, combined with a low purchasing power has resulted in a diet high in packaged, processed, high-calorie and low-nutrition food (Turner and Turner in press). This dietary trend is a global

phenomenon. Increasingly, “Modern societies seem to be converging on a diet high in saturated fats, sugar and refined foods and low in fibre – often termed ‘the western diet’ – and on lifestyles characterized by lower levels of physical activity” (Popkin 2003:581).

The health consequences of this major dietary change are profound (Popkin 2001). First Peoples are over-represented in rates of diet-related health problems, which have become common throughout North America (Turner and Turner in press). The incidences of heart disease, for example are 1.5 times higher and rates of type-2 diabetes are three to five times higher in First Nations than in non-indigenous communities (Turner and Turner in press).

Part of the impetus for re-adopting traditional food is to help alleviate the health problems stemming from the dietary transition (Kuhnlein 1984; Kuhnlein 1992; Kuhnlein and Receveur 1996; Nuxalk Food and Nutrition Program 1984; Turner and Turner in press). Root vegetables, as major storage organs of plants, contain carbohydrates that are usually maximized at the end of the growing season, before the plants start to grow for the next season. In addition, if the skin of the root is consumed (which was the usual practice for traditional Nuu-chah-nulth root vegetables), the roots can serve as a good source of mineral nutrients (Kuhnlein and Turner 1991). These roots also contribute considerable dietary fibre and essential vitamins (Turner and Kuhnlein 1982:429). Table 2.2 on the following page shows the nutritional constituents of the root vegetables of my study – riceroot, silverweed and springbank clover. Although evidence suggests that nutrient levels probably varied considerably in the root vegetables, when compared to the potato (*Solanum tuberosum* L. – the common contemporary replacement for the traditional root vegetables), studies have shown that springbank clover and Pacific silverweed were consistently higher in calcium, magnesium, iron, copper and zinc and similarly Northern riceroot was higher in sulfur, phosphorous, iron, zinc and strontium (Turner and Kuhnlein 1982; Turner and Kuhnlein 1983).

Such edible indigenous species cannot be expected to solve the global food crisis, but they do have an important role to play in providing energy, macronutrients and dietary diversity to modern diets (Grivetti and Ogle 2000). As Vandana Shiva (2005:2) writes “diversity is the ground for the turn-around of our food systems – diversity of crops, of foods, of cultures.”

Table 2.2: Nutritional constituents of root vegetables (per 100g fresh weight)

Scientific Name Family Name	Common name	Part used	Food Energy kcal	Water g	Protein g	Fat g	Carbo- hydrate g	Crude Fibre g	Ash g	Thi- mine mg	Ribo- flavin mg	Niacin mg	Vit. C mg	Vit. A RE	Ca mg	P mg	Na mg	Mg mg	Cu mg	Zn mg	Fe mg	Mn mg	Mo mg
Fritillaria Camschatcensis Liliaceae	Riceroot	bulbs	98	74	2.9	0.3	21.8	1.9	1.0	0.04	0.04	0.2	29.0	0	10	61	18	23	0.2	0.7	2.2	mg	-
Potentilla pacifica Rosaceae	silverweed	roots	-	77	1.6	0.3	19.5	-	1.4	-	-	-	-	-	41	53	-	49.1	0.2	0.5	9.1	0.9	<0.1
Potentilla pacifica Rosaceae	silverweed	roots steamed	132	66	3.1	0.6	29.5	9.5	0.9	0.01	0.01	2.4	-	0.2	37	10 9	65	60	1.1	1.1	3.5	0.8	-
Trifolium Wormskioidii Fabaceae	Springbank clover	rhizomes	-	84	1.8	0.3	-	-	0.9	-	-	-	-	-	38	26	-	38.6	0.2	0.2	4.6	0.4	<0.1
Trifolium Wormskioidii Fabaceae	Springbank clover	Rhizomes steamed	74	81	0.7	0.5	16.5	6.5	1.0	0.06	0.04	0.6	-	0.3	34	38	-	68	0.3	0.3	4.2	0.3	<0.1

Table adapted from Table 3A *In*: Kuhnlein and Turner (1991:363).

Abbreviations used in table:

Ca - Calcium
P - Phosphorus
Na - Sodium
K - Potassium
Mg - Magnesium
Cu - Copper
Zn - Zinc
Fe - Iron

Dietary diversity is an especially pressing need in remote communities like Ahousat, where people have limited access to affordable fresh produce. The Coastal B.C. Native Food Guide (see Appendix F) suggests eating a variety of foods from each of the food groups (one of which includes traditional root vegetables) every day. Not only does using a variety of local, fresh foodstuffs have economic and cultural benefits but there are also health benefits in dietary diversity, since consuming a range of foods alleviates a risk of ingesting an overload of toxins from any one food (Kuhnlein 1981; Nabhan and Rood 2004).

As well as the benefits from the consumption of local traditional food, the production and harvesting of this food promotes an active lifestyle, with plenty of outdoor exercise, which is itself recognized to be beneficial to health in the broadest sense: physically, spiritually, emotionally and mentally (Turner and Turner in press). The root vegetables focused on in this study are among many traditional foods that can be revived to some degree. And, fortunately, “as long as some knowledge of the food exists, with some availability or access to it, the one-way trajectory on this continuum of loss need not be only in one direction. It is possible to reverse the trend, to regain use of and even redevelop knowledge about a given food, and to reinstate it into the diet if this is considered desirable for health, cultural or other reasons” (Turner and Turner in press). The opportunity to celebrate food, and through it culture, knowledge, and tradition, is critical to maintaining the health and vitality of any community (Turner et al. in press).

2.4.3 *The antiquity of root gardens*

Over many generations of observation and practice the Nuu-chah-nulth have developed a great depth of knowledge and understanding of plant management techniques. Within Nuu-chah-nulth territory there exist accounts of how patches of *kuuxwapiihmapt* (riceroot, *Fritillaria camschatcensis*), *tlicy'upmapt* (Pacific silverweed, *Argentina egedii* spp. *egedii*) *Sa Siic'uqmapt* (springbank clover, *Trifolium wormskioldii*) and other edible root vegetables were cultivated into gardens, which were carefully tended and ‘looked after’ (Deur 2000; Turner and Peacock 2005).



Figure 2.3: A ‘patch’ of *ʁa ʁiic ’uqmapt* (springbank clover) in Clayoquot Sound

In addition to the local accounts of these gardens, there are also records from early explorers. Archibald Menzies, the botanist on Captain George Vancouver’s expeditions, for example, noted a number of Nuu-chah-nulth women working in estuarine root (clover) plots at Tahsis, on the west coast of Vancouver Island in September 1792:

In the evening our curiosity was excited in observing a number of females busily occupied in digging up a part of the Meadow close to us with sticks, with as much care and assiduity as if it had been a potato field, in search of a small creeping root about the size of a pack thread. This I found to be the roots of a new species of Trifolium [*T. wormskioldii*] which they always dig up this time of year for food...Wherever this Trifolium abounds the ground is regularly turned over in quest of it’s roots every year (Menzies 1923:116).

However, although many of the early explorers on the Coast noted signs of cultivation practices, most mistook these intensively managed landscapes as natural features (Deur and Turner 2005). They assumed that the region was an ‘untouched wilderness,’ so abundant in resources that the people needed only to hunt and gather their food from the ‘wild.’ Until quite recently this view of Northwest Coast peoples as non-

cultivators was further perpetuated by anthropologists and scholars who shared the commonly held belief that the indigenous people of the Northwest Coast of North America were true ‘hunter-fisher-gatherers’ that did not rely heavily on plant foods and lacked plant cultivation of any kind (Deur 2002). Furthermore, any signs of possible cultivation that were observed were attributed to European influences. Despite numerous explanations from First Nations that proved otherwise, only recently has it been widely recognized by academics that this depiction of the region's indigenous inhabitants is in fact inaccurate. Today, after a critical reconsideration of these ideas with the help of many Indigenous elders, academics now understand that Northwest Coast peoples were in fact actively cultivating plants long before their first contact with Europeans (Deur and Turner 2005).

2.4.4 The language of roots and root gardens

Nuu-chah-nulth lands, people, food and language are all interconnected; to gain a better understanding of the traditional root vegetables, it is important to consider and to search for evidence through all of these elements. As Nancy Turner explains

Traditional Ecological Knowledge is often embedded in local language and can sometimes not be effectively translated into another language. For example, the names of plants, animals and places often reflect profound ecologically based knowledge

(pers. comm. 2006).

Furthermore, indigenous languages often express abstract concepts quite differently than does the English language (Salmon 2000).

The Nuu-chah-nulth language has played a critical role in traditional resource management systems, including the root gardens and root harvesting, preparation and consumption. Table 2.3 provides some of the Nuu-chah-nulth words related to these gardens.

Table 2.3: Nuu-chah-nulth root garden related words

Nuu-chah-nulth Name	English Translation	Reference
λ'aayaʔas	growing in, on, and out of the earth, in reference to a garden	Trudy Frank and Lena Jumbo 2006
λ'aayaçasiil	making a garden, to plant a garden	NTC 1991
tlh'ayaqiyaktlhama	cedar stakes that marked the boundaries of root garden plots at the Somass estuary	Sapir 1913-14: 23
ts'isak̓is	'earth; dirt', Pacific cinquefoil and wild clover were harvested here	Bouchard and Kennedy 1990:464
tuuk ^w itap	to plant something	NTC 1991
c'opqa	to stick something into the soil [a term for planting]	Sapir and Swadesh 1939
tokwa	to cover something with soil [a term for planting]	Sapir and Swadesh 1939
qawiçasiil	to plant potatoes	NTC 1991
shishp'ika	cultivated	Bouchard and Kennedy 1990:43
λ'aqk ^w ist'as	growth, shoots just starting to come up	NTC 1991
λ'aqasiλ	sprouts coming up	NTC 1991
λiih̓ciip	flowers	NTC 1991
šišmaas	to weed a garden	NTC 1991
?o:simches	a physical and spiritual preparation, which among other things, was done prior to harvesting root vegetables	Sapir (n.d.) <i>In</i> : Thomas 2000:189
çusšaa	to plow, to dig all around	NTC 1991
t'i:ky'ak	root digger made out of tlatmapt (Western yew)	Sapir (n.d.) <i>In</i> : Thomas 2000:189
çuusçuusaa	digging (a garden)	Barkley Sound Dialect Working Group 2004:80
t'iq ^w aa	digging (for roots)	Barkley Sound Dialect Working Group 2004:80
mułmumc	roots	Trudy Frank pers. comm. 2006
ha?um	food	NTC 1991
kwisaap'alhshitl	food which because it is only occasionally eaten, tastes especially good (Note 2)	Ellis and Swan 1951:59
qaawic	potatoes	NTC 1991
k ^w an'is	camas	NTC 1991
λicy'upmapt	silverweed (plant)	Scientific Panel 1995b

λicy'up	silverweed (roots)	Scientific Panel 1995b
tlichmakis	refers to any area where there is a lot of tlitsy'up	Bouchard and Kennedy 1990:52
kuuxwapiihmapt	rice root (plant)	Scientific Panel 1995b
kuuxwapiih	rice root (roots)	Scientific Panel 1995b
qa?o:ts	pack basket, sometimes used for carrying roots	Sapir (n.d.) <i>In:</i> Thomas 2000:189

Note 1: To minimize the errors that might result from converting the symbols in this document, I have retained the Orthography used in the reference document.

Note 2: The term was used when discussing low tide food, but may refer to other foods as well.

It has long been recognized that detailed local languages exemplify the importance of particular phenomena to a community. Edward Sapir for example wrote that, “when ideas are expressed in Nootka... we are led to infer that each of these acts is a highly typical one in the life of the tribe, and hence constitute important elements in its culture” (Sapir 1912:239).

Numerous Nuu-chah-nulth place names also reflect the importance of traditional root gardens and root vegetables in the diet and seasonal rounds. As LaRochelle and Berkes (2003:366) explain, meaning in place names are often “drawn from the relationship between humans and the natural environment, and from a keen insight into natural processes on the land.” For example, *shishp'ika* refers to a site in Clayoquot Sound where silverweed roots were gathered (Bouchard and Kennedy 1990). Hesquiaht elder Alice Paul explained that the term *shishp'ika* means cultivated, and “refers to the way people used to look after the beds of cinquefoil” at the site (Bouchard and Kennedy 1990:43). Ahousaht elder Stanley Sam also spoke of an area just offshore from the Moyehai Reserve called *t'ikwukwis*, which means ‘root digging beach’ (Craig and Smith 1997). Table 2.4 lists places in Clayoquot Sound that are associated with traditional root vegetables and Figure 2.4 shows garden sites that were identified by Nuu-chah-nulth consultants in Bouchard and Kennedy (1990).

Table 2.4: Areas associated with traditional root vegetables in Clayoquot Sound

Nuu-chah-nulth Place name	Area	Association
shishp'iqa	Pacific cinquefoil site situated a short distance southeast of ʔaahuus	Pacific Cinquefoil
tlichma7a	Area on eastern side of Southern tip of Matlahaw Point	Pacific Cinquefoil
tl'aayaa7a	A grassy area on north shore of Rae Basin	Pacific cinquefoil roots and wild clover roots were gathered here
tl'ayaqwulh	An area on west side of end of wide point which is adjacent to westernmost channel leading into Hot Springs Cove	Pacific cinquefoil roots, wild clover
qaamiilhuwis	Tidal flats immediately south from islands at mouth of Sidney River	Pacific cinquefoil and wild clover roots dug here.
ma7uwis	An islet east from mouth of Megin River	Roots of Pacific cinquefoil and wild clover were dug here
watih	Area now identified as "Watta Indian Reserve #25" at mouth of Watta Creek.	Cultivated naturally growing beds of Pacific cinquefoil and wild clover
tl'imaqis	A small bay with creek draining into it, located on the east side of Shelter Inlet, south from qaaqatqwi7is	Was a site for Pacific cinquefoil and wild clover but this was burned
t'iikuwis	Tidal flats just offshore from Moyehai Indian Reserve #23 and extending to Moyeha River mouth.	Beds of wild clover here were owned and cultivated.
muuyahi	The Moyehai Indian Reserve #23 and Moyeha River	Wild clover and Pacific cinquefoil
wa7uus	Wahous Indian Reserve #19 at mouth of Cypre River	Roots (Pacific cinquefoil)
ʔiiqwuu7a	A flat rock on a point at northern end of uu7inmitis village at mouth of Bedwell River	Gathered Pacific cinquefoil and wild clover roots
ts'isaqis	Area around mouth of second creek north from Heelborn Bay on east side of Meares Island	Pacific cinquefoil and wild clover were harvested
ts'aaht'as	A freshwater spring located about the middle of Opitsat Indian Reserve #1	Gathered Indian potatoes (muuqwtih) ?
apwinqis	Shoreline southwest of Kootowis Indian Reserve #4 in Grice Bay	Plant called qwakapiih gathered here (identity unknown)
uuqwmin	Okeamin Indian Reserve #5 on east side of mouth of lower Kennedy River	...wild clover roots, Pacific cinquefoil roots
ʔaahuus	Area along western shore of Hesquiat	Camping site while

	Peninsula, northeast from qaqatsts'ista	gathering Pacific silverweed and other roots
ma7uwis	An islet east from mouth of Megin River	Camping area where people dried butter clams and dug roots of Pacific cinquefoil and wild clover

Note 1: This table was adapted from Appendix VI, The Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, First Nations' Perspective Relating to Forest Practices in Clayoquot Sound (1995)

Note 2: Wild clover refers to springbank clover (*Trifolium wormskioldii*)

Note 3: To minimize the errors that might result from converting the symbols in this document, I have left the Orthography used in the reference document.

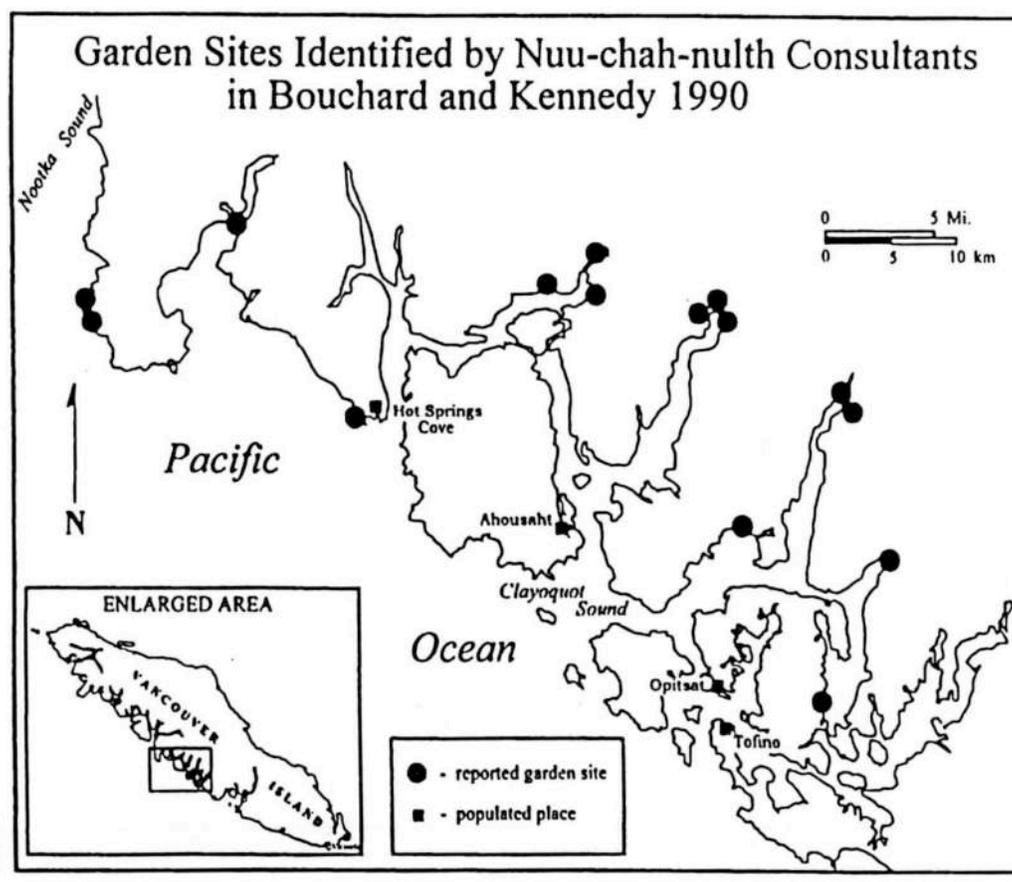


Figure 2.4: Garden Sites identified by Nuu-chah-nulth consultants in Bouchard and Kennedy (1990) (From: Deur 2000:103)

Plant knowledge continues to be an essential part of Nuu-chah-nulth cultural knowledge. In addition to being communicated through place names, plant knowledge is also inextricably connected with traditional teachings and ceremonies, as discussed in the following section.

2.4.5 Sacredness and respect – traditional teachings

Deeply embodied in this traditional food system were philosophies of caring and respect. *Hishuk ish ts'awalk*, *Isaak* and *hahuuli* are just three of the concepts that have guided and shaped traditional Nuu-chah-nulth resource use and management for millennia. The living philosophy *Hishuk ish ts'awalk*, or 'everything is one,' "embodies the Nuu-chah-nulth sacredness and respect for all life forms and their approach to resource stewardship" (Scientific Panel 1995a:vii; Atleo 2004). For the Nuu-chah-nulth, humans are viewed as stewards of the lands and seas and are responsible to maintain, enhance and protect these resources (Scientific Panel 1995a).

Isaak (respect for all life forms)... is predicated upon the notion that every life form has intrinsic value and that this should be recognized through appropriate protocols of interaction... *Isaak*, as another law of life, promotes balance and harmony within creation... it means that life forms of every kind are held in equal esteem...All life forms have intrinsic value...Humans of every race have equal value, as do deer, the wolf, the whale, the eagle, the cedar tree (Atleo 2004:130).

Hahuuli not only conveys hereditary ownership and control of traditional territories by the chiefs or *Haawiih*, but also a responsibility of the chiefs to care for the land and resources and to share them with their community. This term "...represents a long history of resource use and management" (Scientific Panel 1995a:vii). In, *The Social Impacts of Governmental Control of our Chief's Ha Hoolthe and Natural Resources*, Roy Haiyupis explains that through *hahuuli* "... the hereditary chiefs have the responsibility to take care of the forests, the land and the sea within his *hahuulhi* and a responsibility to take care of his *mus chum* or tribal members" (Scientific Panel 1995a:9). In addition, it is noted that, "maintenance and enhancement of the natural food chain to sustain members is a spiritual responsibility that extends to all people. So too is the responsibility for maintaining and enhancing the quality and quantity of forest resources [and] this responsibility extends to future generations" (Scientific Panel 1995a). In addition to the Nuu-chah-nulth philosophies and systems of resource management that guided the maintenance of root gardens, there were also extensive ceremonial practices associated with both the harvesting and eating of the roots.

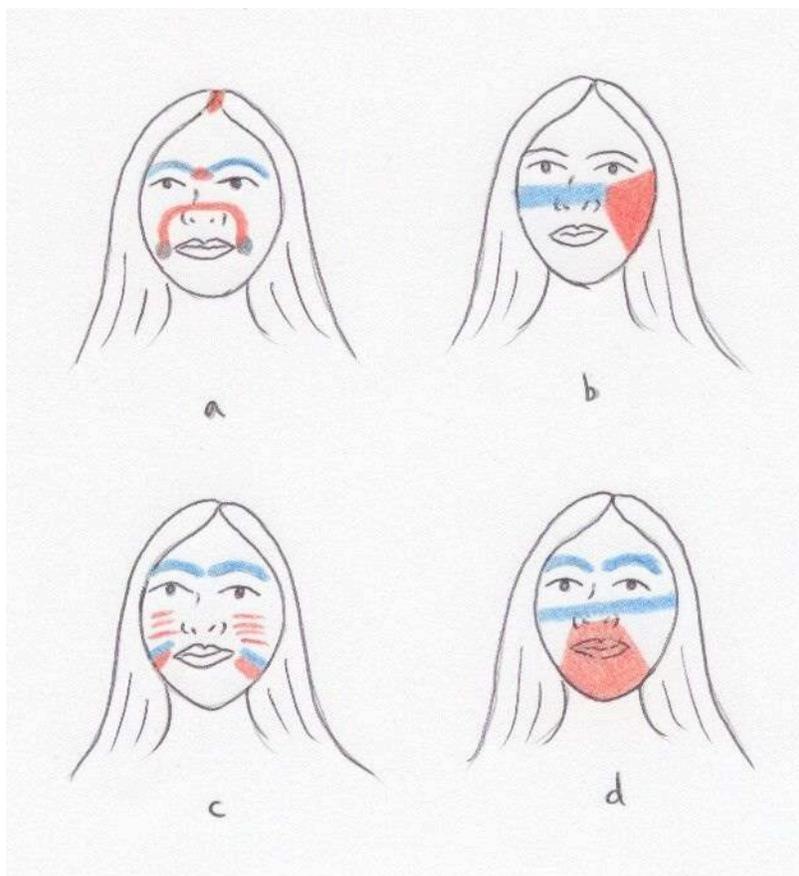
2.4.6 Root vegetables and ceremony

Ceremony played an important role in the harvesting of root vegetables as well as in the feasts that followed the harvest. Ethnographer Edward Sapir noted that face painting was part of the physical and spiritual preparation called *?o:simch* which was undertaken prior to harvesting root vegetables (including silverweed, clover and riceroot), among other activities such as whaling, seal hunting and medicinal plant gathering. In Nuu-chah-nulth practice, it is considered essential to prepare oneself properly in order to succeed in all of life's activities and it was well understood that all things come from the spiritual realm (Atleo 2004; Hoover 2000). As Atleo (2004:17) explains, “whatever powers or gifts were sought, the principle behind *oosumich* remained the same: that effective access to the spiritual dimension from the physical dimension was absolutely necessary.”

Arima describes how “paintings are ritual costumes and include more than just the facial paint. Masking the wearer, they transform the person in a symbolically appropriate manner” (Thomas 2000:174). For example, in describing the image of a woman painted for a clover digging ritual (see Figure 2.5a), Sapir, as cited in Thomas (2000:189) notes that

She *?o:simches* that she may strike a patch where *?a?i:ts'o* [clover] was thick and that it may seem to come up of its own accord, thereby filling up many *qa?o:ts* in a short time, and also that the *?a?i:ts'o* she digs up may have a good rich flavour and not have a watery taste.

Similarly, regarding a ritual for digging “onions” (possibly *Allium cernuum*, but probably camas bulbs – *Camassia quamash*), it is noted that if a “woman goes out without having *?o:simched*, she digs up nothing but small ones, the big ones all running away from her, and she comes home with just a few handfuls of small *kwan'is*, having a watery taste and not fit to eat...” (Thomas 2000:189).



- a. Woman painted for clover root digging ritual
- b. Woman painted for *kwan'is* (wild onion) digging ritual
- c. Woman painted for *tlichsy'op* (pacific cinquefoil) digging ritual
- d. Woman painted for *ha:tix* (blue camas) digging ritual

Figure 2.5: Nuu-chah-nulth face painting in preparation for root digging¹
 Illustrations are adapted from Thomas 2000:C-4²

Early Northwest Coast ethnographers cited by Deur (2000, 2005) also noted ceremonialized feasts that were alternatively devoted entirely to the consumption of

¹ The illustrations and notes on the previous pages are originally from Edward Sapir's (n.d.) *Notes on Secret Rituals*, (American Philosophical Society Library, Sapir Notes mss i and j), but have been cited from Thomas (2000). Arima and Thomas condensed some of Sapir's original notes to lessen their length but explain that in doing so the text has lost some of the rich redundancy of the original with its Nootka-like phrasing (Thomas 2000:174).

² Douglas Thomas, the son of Tom Sa:ya:ch'apis was Sapir's principal source of information about the face paintings.

either silverweed roots or clover rhizomes. The feasts were often held in the winter and frequently included great quantities of root vegetables (Drucker 1951; McIlwraith 1948). As cited in Deur (2005:301) Drucker recorded that Nuuchahnulth “feasts were commonly held in the early winter, following two to three months of post-harvest storage [after which] the roots reportedly grew sweeter...” Thomas McIlwraith, in his book *The Bella Coola Indians* (1948), noted that cedar wood boxes of estuarine roots were consumed as a regular part of winter ceremonial dances along the entire coast. And, Drucker’s elderly consultants described how “tales of famous feasts speak of young men having to go up on the roof of the house to pour in water to make steam, so high were the piles of clover roots” (Drucker 1951:62).

2.4.7 Roots as an important trade item

The importance of the traditional root vegetables as a trade good has been recorded in accounts from some of the earliest explorers on the Northwest Coast. John Jewitt, who was held captive by Nuuchahnulth Chief Maquinna, observed that bundles of estuarine root vegetables, namely *quawnoose* (camas) were coveted trade items (Stewart 1987). As cited in Stewart (1987:100), Jewitt described the following:

The Wickinnish and Klah-zarts brought to market many slaves, the best sea otter skins, great quantities of oil, whale sinew, cakes of yama... and an excellent root called by the Klah-zarts Quawnoose...

In addition, Jewitt wrote about purchasing and tasting an edible root vegetable called *kletsup* (likely silverweed), which was “about six inches long... the size of a crow quill”, and came from a plant that he had never seen (Stewart 1987:120).

...we bought from one of the natives, some dried clams and oil, and a root called kletsup which we cooked by steaming and found it very palatable.
(Stewart 1987:120)

McIlwraith (1948) also noted that cedar wood boxes of estuarine roots were common items of exchange at potlatches. Early ethnographer Edward Sapir wrote that for the Kwakiutl “clover land is very valuable, because the roots, which are limited in

quantity, are regarded as indispensable to health and hence can readily be sold at a high price” (Sapir 1915:43). Some of the “first explorers reported that the Pacheenaht (Nitinaht), and possibly some Nuu-chah-nulth groups, were traveling to Straights (Salish) country for roots and fruits” (Suttles 1951, as quoted in Turner and Kuhnlein 1983:207).

Although the estuarine root vegetables are no longer a part of the Nuu-chah-nulth diet, many traditional foods are still shared among communities today; Trudy Frank (pers. comm. 2006) explained that:

...we trade around ...supply with fish... like when we go up to Gold River we get sockeye up there, cause they get sockeye in the river, so we sort of trade... We make them jam, blackberry, yama [salal] jam, cranberries...that's how we sort of exchange things...

2.4.8 Plant management and cultivation techniques

Sustainable living for the Nuu-chah-nulth has required a great depth of knowledge and understanding about their surroundings. Over many generations of careful observation and practice, the ancestors developed practices and strategies that promoted the productivity and reliability of culturally significant plants as well as maintained natural processes and the health of the environment (Craig and Smith 1997). The estuarine root gardens, for example, were carefully tended to maintain and enhance the production of root vegetables through a variety of strategies including ownership, weeding, selective harvesting, replanting, routine digging and tilling and occasional transplanting (Turner and Peacock 2005). Following is a brief description of the previously mentioned techniques that were used in the cultivation and management of Nuu-chah-nulth root gardens, with a focus on the practices of the Ahousaht First Nation.

2.4.8.1 Ownership of places and resources

Through the institution of *Hahuuli*, traditional root gardens were held under the proprietorship of hereditary chiefs and their designates and passed on from one generation to another. In many cases this “ownership” resulted in intensive monitoring, harvesting, and managing of sites and resources and as Turner and Peacock (2005) suggested, ultimately led to sustainable resource use. Dave Frank explained to me (pers.

comm. 2007) that “... *in the early days... people had ownership to some of these things even though it was out in the wild, they worked at it, they did some work to enhance it...*” Ahousaht elder Stanley Sam remembers digging wild clover roots when he was a young boy, in clover patches near the Moyehai Reserve at a place named *t’iikwuwis*, which means ‘root-digging beach’ (Bouchard and Kennedy 1990). The beds of clover were owned by his father’s mother, an original Ahousaht woman named *ts’iikap*, who used to cultivate these beds of clover and look after them (Craig and Smith 1997; Bouchard and Kennedy 1990). Another area in Ahousaht territory, along the shore of Cypress Bay east from the mouth of the river was a ‘well-known’ place to dig the roots of *tlitcy’upmapt* (pacific cinquefoil) (Bouchard and Kennedy 1990:377). The *tlitcy’upmapt* grew in beds here and was owned and cultivated by certain individuals. Each owned plot was marked by poles laid on the ground (Bouchard and Kennedy 1990; Turner and Jones 2000; Deur and Turner 2005). James Swan (Bouchard and Kennedy 1990:377) noted that:

...there used to be strong disagreements over the boundaries of these cinquefoil beds, and some owners moved the poles to extend their own boundaries. This occurred until a strong man named *hinkaa7at*, a member of the *haashaashtakimlh* family group of the Ahousahts, placed large rocks on top of the poles to prevent them from being moved.

Garden boundaries were also sometimes marked with rock piles, posts or paths of compressed soil. Nuu-chah-nulth consultants described root patches at the Somass estuary to Sapir (1914) that had four cedar stakes, which were six feet high and called *L!ayaqi’yakLa-ma*, marking the boundaries of the area, which were one acre in extent. The posts were sometimes marked or decorated with cedar bark ‘flags’ and were changed about every ten years to prevent rotting (Sapir 1914).

In addition, when performing archaeological reconnaissance work in Clayoquot Sound in 1996 and 1997, Deur (1998) encountered a number of root garden sites that had a lot of large rocks at apparent plot corners.

In some cases, it appears that gardens were even guarded against theft. For example, Mrs. Ida Jones recalled stories of a Pacheedaht Nuu-chah-nulth chief who had between six and ten slaves guard a particular patch of silverweed to be sure that no unauthorized person would dig there (Turner and Kuhnlein 1982). In addition, “when the

roots were ready to be harvested, he had his slaves dig them for him” (Turner and Kuhnlein 1982:423).

2.4.8.2 *Garden construction*

In high-relief shorelines or in places with relatively small natural salt marshes (such as in Nuu-chah-nulth territory in Clayoquot Sound) Franz Boas (n.d.:166) observed that rocks were commonly placed in “large piles or in walls which surround a [root garden] bed” and appear to have helped retain mounded and churned marsh soils (Deur 2005). When asked why rock walls were constructed in some places and not in others, Kwakwaka’wakw elder Daisy Sewid-Smith (*Mayanilth*), suggested that soil mounding and rockwork construction expanded the extent of area in which these plants might grow (Deur 2005). In addition, other elders have suggested that “whether or not retaining features were used, the practice of mounding soil expanded the area where these important root foods could grow in the estuary” (Deur 2005:312). Chief Adam Dick (pers. comm. to N. Turner, October 2005) called these root gardens “hand made.” Deur concludes, “Northwest Coast peoples appear to have learned how to subtly modify the salt marsh in order to maximize the productivity of these unique areas” (Deur 2005:313). Figure 2.6 on the following page, from Deur’s doctoral dissertation (2000) illustrates how garden rockwork would have altered the estuarine structure.

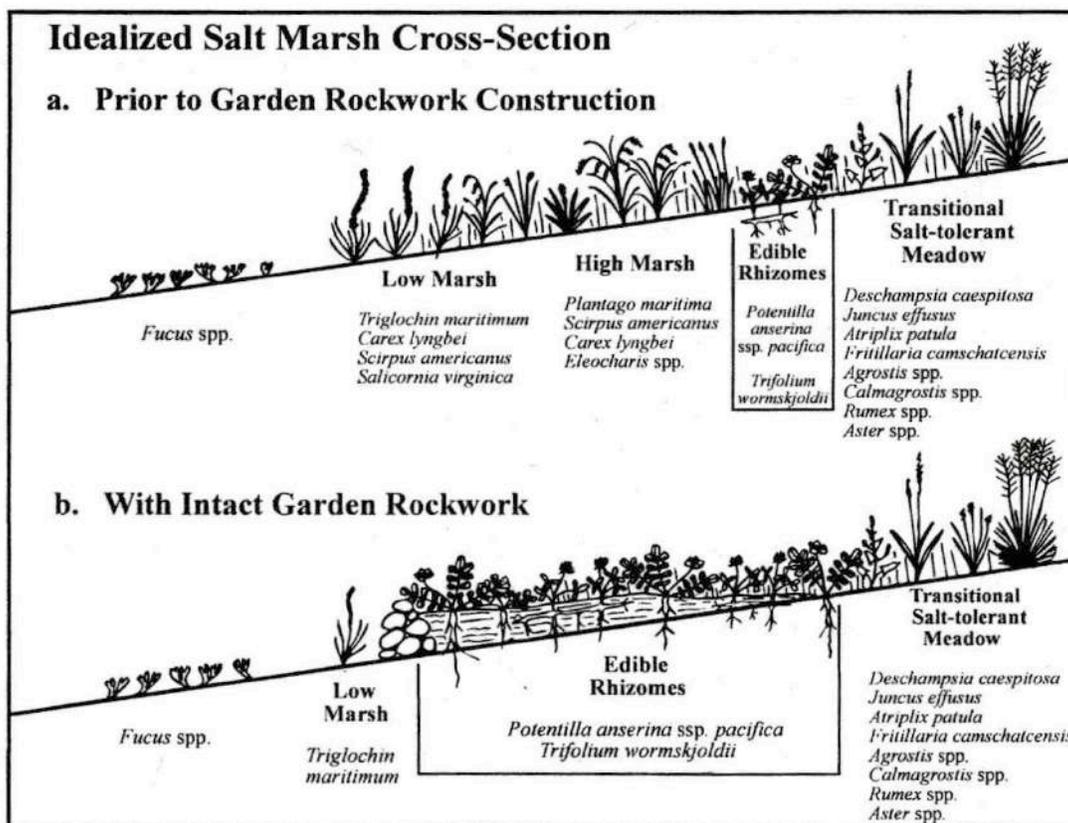


Figure 2.6: Idealized salt marsh cross-section (From Deur 2000:173)

The size of these root garden plots appears to have varied between sites and possibly over time (Deur 2005). Around the early 1900s ethnologist Edward Sapir (1914) recorded Nuu-chah-nulth garden plots of up to one acre at the Somass River flats. However, in other areas, the gardens appear to have been much smaller.

2.4.8.3 Weeding

Root patches were also sometimes ‘weeded’ to remove sticks, stones and competing vegetation to help increase the competitive advantage, increase the productivity of desired species, and make digging easier (Deur and Turner 2005; Turner and Peacock 2001; Turner and Peacock 2005). The weeding of competitive plants such as grasses, rushes and sedges from the estuarine root plots, allowed for the expansion of the beds of edible roots, such as *Argentina* and *Trifolium* into areas that previously contained competing vegetation (Deur 2005). As mentioned in Table 2.3 there is at least one term in

the Nuu-chah-nulth language for weeding – *sismaas* meaning ‘to weed a garden’ (NTC 1991).

2.4.8.4 Routine digging and tilling

Specialized digging sticks made of yew wood (*Taxus brevifolia*) and sometimes crabapple (*Pyrus fusca*) were commonly made along much of the Northwest Coast for the ‘turning of the soil’ and harvesting of root vegetables. In 1939, Sapir and Swadesh noted that the Nuu-chah-nulth have an etymologically distinct verb *t’ikwa* that alluded solely to the use of these specialized digging sticks, referred to as *t’i:ky’ak* (Deur 2005; Sapir nd:189).



Root digging sticks are said to have varied in length (Deur 2005). Boas (n.d.:166) reported that there were actually two distinct and specialized tools used in the harvesting of root vegetables, one for silverweed and one for clover. The one used for silverweed (*Argentina egedii* spp. *egedii*) was said to be “a little thinner and one span shorter than the clover digging stick” (Boas n.d.:166; Deur 2005).

The root digging stick shown in Figure 2.7 was carved by the author, with much help and guidance from Nuu-chah-nulth carver Joe Martin.

Figure 2.7: Yew-wood root digging stick

The routine digging and tilling of the soil with such root digging implements, both during the harvesting process and, in some cases, as a separate management activity, was also suggested to enhance the growth of root vegetables, by loosening and aerating the soil and distributing essential nutrients (Deur and Turner 2005).

The Nuu-chah-nulth recognized an elaborate traditional taxonomy of soil properties and had distinct terms for different kinds of soil: “soil that is easily broken up,” “soft, yielding soil in which one sinks easily,” “level soil,” “muddy soil” and “sandy soil” (Sapir and Swadesh cited in Deur 2005:314). In addition, Bouchard and Kennedy (1990:464) described at least one Nuu-chah-nulth garden site that has remnant rockworks, with the place name “*ts’isak̄is*,” which may be related to *ts’isimts*, which translates as ‘earth’ or ‘dirt.’ The word *ts’isak̄is* is etymologically distinct from terms referring to naturally occurring root grounds (Deur 2005). The name *ts’isak̄is* is significant because the site appears to have been one that was expanded by accumulating soil behind a low rock structure (Deur pers. comm. 2008).

2.4.8.5 *Harvesting*

Harvesting of root vegetables, as with other plant resources, was usually undertaken by women (Turner in press; Turner 1995; Turner and Kuhnlein 1983). The root vegetables were generally harvested in the late summer or early fall when the leaves had started to die back – at ‘chum salmon time,’ although they can be and were harvested at other times as well (Scientific Panel 1995b). The roots were considered good for digging from the time when the leaves had started to change colour and die back right through until the early spring when new leaves started to appear (Turner and Kuhnlein 1982). However, when roots were dug in the spring, the harvester needed to know exactly where the plants had been growing, so that they would know where to dig. For this reason, it was easier to find the roots in the fall because their leaves were still visible. Although some groups on the coast felt that roots dug in the summer were usually too small, tough and woody, the Hesquiaht and other Nuu-chah-nulth tribes were said to have dug silverweed roots in mid-July (Edwards 1979; Turner and Efrat 1982).

During the harvest season the women would typically work for several days at a time (Turner 1983, Deur 2005; Turner et al. 1983). The harvesting of the ‘roots’ is described in the following passage by Ida Jones from Nitinaht.

Next month [October] is the month for gathering cinquefoil roots by the women. They will dig as many roots as they could gather. They dig on sandy ground, as long as [there is] daylight, but not hurrying. Some women have longer digging

sticks than others. She leans on it, twisting it when going into the sand, always watching how far down it goes, then she pries it [out], breaks off the sand, takes hold of the root and puts it into the pack basket. She gathers like this for many days, until she has as much as she needs for winter. Then she quits. They invited each other [to go digging], I guess so they won't be lonely or sad, because they are happy, passing on news, when they gather roots. They put all four kinds away for winter use... (Turner *et al* 1983:18)

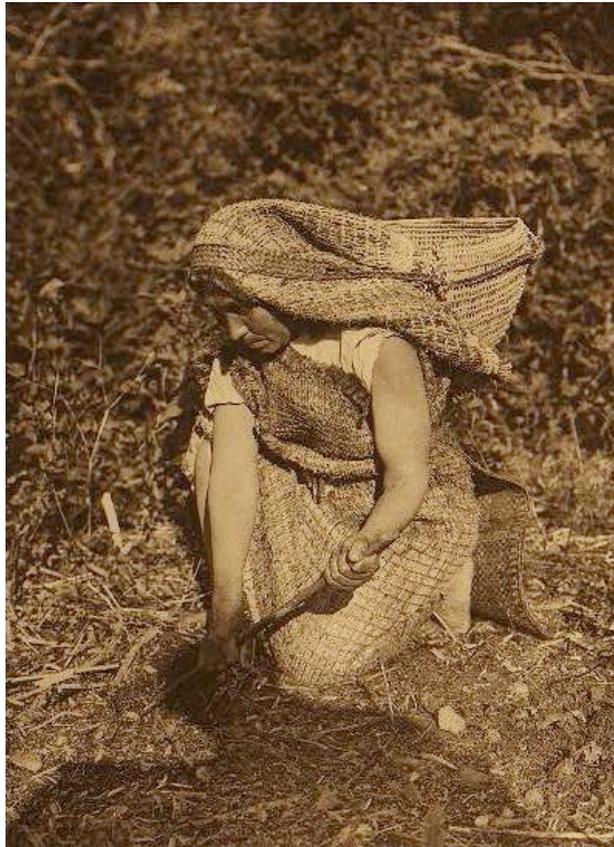


Figure 2.8: Virginia Tom from Hesquiat digging root vegetables (Curtis circa 1915)

The harvester would usually dig around a clump of roots, turn it over and then select and remove the appropriate sized edible portions. They would then return any remaining bits and cover them up again (Turner and Peacock 2005). This had the effect of allowing the root fragments to regenerate, and in a few years, there would be more roots to dig.

2.4.8.6 *Selective harvesting*

Root vegetables were selectively harvested based on both cultural and environmental considerations (Turner and Peacock 2005). The most important criteria considered included the yearly growth cycle, reproductive status and maturity of the plants, as well as the size and taste of the roots. Selecting plants at a certain life cycle stage, or according to age and size, served to thin out the populations, and as a result decreased intra-species competition. Only roots of a certain age and size were taken. The younger roots, which can be distinguished from the previous year's because they are firmer and lighter coloured (compared to softer, dark-brown to almost grey), were preferred for food (Turner and Kuhlein 1982:418). In addition, the largest plants were frequently left to go to seed while the younger, smaller individuals were left to continue growing (Turner and Peacock 2005). Ahousaht Chief Earl Maquinna George explained that “there is a name for “conservation” in the Nuu-chah-nulth language: *7uh-mowa-shitl* (“keep some and not take all”) (George 2003:68). Although he wrote that this word pertained to the careful use of the salmon fishery, both Dave Frank and Trudy Frank mentioned the importance of ‘never taking all’ when harvesting plants as well. Indigenous restoration specialist Dennis Martinez (2006:np) explained that, more generally, “Native land ethics teach not to take more than you need or that the land can provide.” He also expanded on this idea: “Native ethics as care giving goes even further: if you do not use it, you lose it. Many (although not all) plant communities require disturbance to thrive. So, in the act of using plants, they are enhanced and conserved” (Martinez 2006:np). Trudy Frank also talked about the role of harvesting in actually increasing the productivity of the roots.

They used to say, the more you keep using it the more it'll produce... it's like, the more often you go out there to pick berries, the next year you're allowing it to grow more.

Similarly, Western scientists also recognize the role of ‘disturbance’ in enhancing the productivity of these plants. The U.S. Department of Agriculture for example, in describing how to grow springbank clover and Pacific silverweed states that, “it is necessary to divide the springbank clover [and silverweed] patch every 3 to 4 years,

starting a new patch [with the roots removed] and increasing plant vigor. Younger plants are more vigorous and produce more flowers and seeds” (USDA 2007).

2.4.8.7 *Replanting*

As noted previously, when harvesting root vegetables such as springbank clover and rice-root, leaving viable growing parts behind to propagate and grow into new plants was a common practice (Edwards 1979; Turner and Peacock 2005; Deur and Turner 2005). Hesquiaht elder Alice Paul explained to Bouchard and Kennedy (1990:42) that “the people were very careful when digging Pacific cinquefoil” and the ends of both the cinquefoil roots and wild clover rhizomes were replaced in the ground to ensure that the plants would grow the following year (Turner and Efrat 1982). She clarified that replanting “had to be done ‘just right’ in order to ensure there would always be more plants” (Bouchard and Kennedy 1990:42). Also, because many root-vegetables were harvested after flowering, the seeds from mature plants could be knocked unintentionally or sprinkled intentionally into the loose soil, and this would have the effect of helping to maintain the plant propagation (Turner and Peacock 2005).

There is also linguistic evidence for vegetative planting. Sapir and Swadesh noted two different Nuu-chah-nulth terms related to planting: *c’opqa*, to “stick something into” the soil and *tokwa* “to cover something with soil” (Deur 2005). Both terms appear to describe vegetative planting methods that were used in estuarine root gardens.

2.4.8.8 *Transplanting*

Transplanting involves the removal of a growing plant, seedling, cutting or other propagule from one place and replanting it in another, usually to make them either more productive or more easily accessible (Turner and Peacock 2005). A number of coastal peoples have been known to transplant different root vegetables. The Nuxalk of Bella Coola, for example, sometimes transplanted springbank clover and tended them like a ‘garden’ (Edwards 1979). Although it is unclear whether root vegetables were transplanted in Nuu-chah-nulth territory, there are multiple references, which describe the transplanting of estuarine roots within and between other indigenous territories on the coast (Deur 2005).

The previously mentioned techniques and strategies offer a good indication of the value of these root vegetables to traditional diets. In addition to the detailed practice of harvesting the roots, much thought and care was also put into the processing and preparing of the roots.

2.4.8.9 Preparing and cooking the roots

According to Boas (1921), after the Kwakiutl dug root vegetables, the roots were placed in baskets to await further cleaning and processing. Women apparently had distinctive knots that they used to tie the bundles of roots they had harvested, so that they could be differentiated from others' harvests (Turner et al. 1983). The roots were sometimes eaten raw by women who became hungry while they were digging, but most often they were cooked first (Boas 1921:534). Roots were traditionally cooked by steaming in a pit oven. Juliet Craig and Robin Smith (1997:36) described the process as it was explained to them by Ahousaht elders:

The pits were dug and then lined with large rocks. A fire was made in the pit and allowed to burn for several hours until the rocks got hot. Then sand or soil, and then a layer of vegetation (usually salal or sword fern) were placed in the pit and the roots were laid on top. The roots were then covered with more layers of vegetation and soil. A stick or pole was placed in the pit during the process of building it and then once the pit was filled, the pole was removed and water poured down the remaining hole to allow steam inside. The pit was then covered with burlap mats or sacks.



Figure 2.9: Steam pit cook, Ahousaht

Once cooked, the roots were either eaten, or dried for winter use by laying them in the sun on mats (Turner and Efrat 1982; Turner et al. 1983). Ida Jones explained to Nancy Turner (Turner *et al* 1983) that the food usually remained in the steam pit overnight, and was uncovered the following day at noon or after, at which point the roots were cooked. She described the drying process as follows.

Whoever owned them [the roots] would recognize hers' by the tie used in the middle of her bundles. Everyone knew how her know was tied. Then she spreads a clean cedar-bark mat on a board laid flat on the beach, and dumps her roots on top of it and sorts each kind – camas, small-leaf clover, all sorted. There is sunshine and a slight breeze. As soon as they are all dried, then whoever owns them takes them and [puts them in a] big open-weave basket, like a qa?awc basket, but with handles on the sides. In between she puts dried up, yellowish grass. There is no dampness, or it might get mouldy. It is put up on a big, wide board up [near the roof] in the house where it's smoky...all lined up side by side.
(Ida Jones as quoted *In*: Turner *et al* 1983:19)

When it came time to eat the roots Ida explained that,

She will take down as much as she needs, however much they eat, then cook it in pots with grass in the bottom and a small amount of water – steaming, what the white man calls steaming. It is done quickly because it's already cooked, and she took a wooden plate and dumped it on, where it is then eaten at the end of a meal. It is squeezed into balls and then dipped into oil.
(Ida Jones as quoted *In*: Turner *et al* 1983:19)

Drucker (1951:252) noted that in some cases “the first crop of berries or roots or other produce from a Chief’s territory would be picked for the Chief by his designates, and the Chief would then give a feast to his people with them.” In Clayoquot Sound, *tlicy’up* (silverweed roots) and *ʕaʕiic’u* (clover rhizomes) were usually pit cooked or steamed and then eaten with hair seal oil or fermented chum salmon eggs, usually at the end of a meal of salmon or seal (Scientific Panel 1995b). Edward Sapir remarked that “it [clover] is sweet in taste and was a very favourite food in the old days” (Thomas 2000:189). Other root vegetables have been described similarly by Jewitt who wrote that the roots of both *quanoose* (camas) and *kletsup* (silverweed) were ‘very palatable’ with a ‘sweet and agreeable’ taste (Stewart 1987:100). Camas bulbs, another edible root vegetable, were often cooked together in the same pit with silverweed and clover (Turner et al 1981).

In an interview with Juliet Craig and Robin Smith, Ahousaht elder Trudy Frank also recalled eating root vegetables (likely silverweed and clover roots).

Last time I had some [root vegetables] was when my father-in-law picked some, that was the last time I ever ate it. Edwin was saying, “what are you eating?” and I said “taste it, they’re real tasty!” he thought it was strange for me to be eating something he didn’t know, I guess he’d never had it in his childhood...I guess there’s so many restrictions on some of this stuff, finding where to pick is not so easy (Craig and Smith 1997:37).

2.5 Conclusion

Despite the rich natural environment the Nuu-chah-nulth would have been unable to thrive on the coast without great effort, care and respect and without their intimate knowledge and understanding of wild plant foods that was gained over many generations of observation and practice. In the past, resource abundance likely facilitated localized population growth, which in turn would have placed significant pressure on local resources and may have made sensitive strategies such a root gardening essential for survival (Deur 1999). The previously mentioned root gardening techniques demonstrate that, despite the popular belief that plant foods were simply gathered from the ‘wild,’ the root vegetables were in fact tended to and cared for to both sustain and enhance populations for the following years (Craig and Smith 1997). The creation and maintenance of garden habitats for certain culturally important plant species, provides a valuable example of how the Nuu-chah-nulth have sustainably managed their land for millennia.

Chapter 3: λ'aayaŝasiil – to plant a garden

3.1 Introduction

As discussed in chapter one, there are a variety of reasons why the traditional knowledge and use of root gardens and other indigenous ('wild' or uncommercialized) food sources has declined (Kuhnlein and Turner 1991, Shiva 2005; Kuhnlein et al. 2006). However, many elders and leaders in indigenous communities have recently expressed a desire to restore and revitalize these food traditions as a way of restoring traditional ecological knowledge, better health, and strong cultural identity. Raising awareness about these food traditions through research, education and restoration projects can lead to a greater understanding and appreciation of traditional knowledge and lifestyles for people of all ages from both First Nations and non-indigenous communities. Recognizing the depth of traditional knowledge and understanding about plant uses and management techniques is not only worthy of respect and recognition, but also has implications for both current and future resource use and management (Berkes 2000). Furthermore, "the maintenance and enhancement of the natural food chain to sustain tribal members is a spiritual responsibility that extends to all people" (Clayoquot Scientific Panel 1995a:67). The λ'aayaŝas Project was suggested as a way to revitalize the knowledge and practice associated with this important Ahousaht food tradition.

3.1.1 The λ'aayaŝas Project

λ'aayaŝas - 'growing in, on and out of the earth'

λ'aayaŝas (pronounced "Tl'eye-yuh-us"), is a Nuu-chah-nulth word meaning 'growing in, on and out of the earth.' This term was identified and suggested as an appropriate name for this root garden project by Ahousaht elders Trudy Frank, Lena Jumbo and Richard Atleo, since it refers to any kind of garden.

The goal of the λ'aayaŝas project was to engage students and community members in Ahousaht in the research and re-creation of a Nuu-chah-nulth traditional root garden, using the major species that people traditionally tended and harvested. The

λ'aayaʒas project was inspired and guided by members of the community at all stages of the project to ensure that it was appropriately designed and delivered. In this chapter, I explain how the *λ'aayaʒas* project unfolded, starting with an overview of ecocultural restoration and the role of ethnobotanical gardens. I then outline some of the key stages in the *λ'aayaʒas* project's development and the community-based participatory action research framework that guided it. In closing I describe some of the challenges we faced, and discuss the role of the garden in engaging community members of all ages in learning about, sharing and renewing Ahousaht botanical knowledge and practices.

3.1.2 Ecocultural restoration and ethnobotanical gardens

The Ahousaht are not alone in experiencing major transformations in their lives over the past century; this has been an experience of indigenous and local peoples all over the world. As mentioned in Chapter One, one of the outcomes of these changes has been a significant decline in knowledge and use of traditional plant foods (Kuhlein et al. 2006; Turner and Turner 2007). Richard Atleo explained to me that,

It seems clear that root vegetables were a deliberate part of traditional Nuu-chah-nulth diet and it is equally clear to me, from personal experience, that during most of the 20th century the cultural knowledge and practice of eating vegetables disappeared from Nuu-chah-nulth consciousness (pers. comm. 2006).

Therefore, a primary goal of the root garden is to help maintain the knowledge and cultural practices around these formerly important root vegetables, and to raise awareness amongst the younger community members about this important Ahousaht food tradition.

The root garden is an example of ecocultural restoration – the process of restoring not only an ecosystem but also the cultural knowledge, skills and practices that have played a role in shaping that system for generations (Martinez 2006; Senos et al. 2006). The root garden is also a type of ethnobotanical garden, a garden that highlights culturally valuable plants. Ethnobotanical gardens, including the Ahousaht root garden, can support education, conservation, entertainment, food preparation, ceremonial practices and artistic inspiration (Turner and Wilson 2005). In addition such a garden can:

- provide a connection to a community's natural and cultural heritage;

- restore and protect the biodiversity of native plants;
- provide habitat for a variety of species;
- eliminate the need for external inputs (such as chemical pesticides, fertilizers and herbicides) and require less watering and mowing than conventional grassed landscapes;
- provide a first-hand opportunity to learn about the natural world, the ecological processes which support it and the cultural practices which have in many cases shaped it for millennia;
- strengthen community ties by fostering a sense of cooperation and instilling feelings of pride and stewardship;
- renew relationships within and between people and the land;
- build a sense of individual empowerment - people learn that they can make a difference to the health of their community and the environment; *and*
- teach children about the delicate balance between living and surviving, through a hands-on relationship with other living organisms (Kawamura 2007).

Although it may sound ironic, in the long term, the root garden may actually help to reduce the need for such a garden because people become more familiar with the plants and the plants themselves will become more healthy and productive in their natural environments (Turner and Wilson 2005). However, for now the root garden can play an important educational role in the community, helping to create awareness of past food traditions and environmental stewardship, and of the relationships to the land that kept people's lives in balance and harmony.

3.2 *Methods*

The *λ'aayaʕas* project was developed as a community-based participatory action research (PAR) project, in which the research is seen not only as a process of creating knowledge, but simultaneously, as education and development for action (Gaventa 1988:19). PAR engages researchers and community members in collaboratively identifying and investigating a local issue. The process aims to support projects that stem from the community and empower both individuals and communities to be actively involved in solutions, in this case, reviving a traditional root garden as a way of renewing traditional ecological knowledge, better health, and strong cultural identity (Richard

Atleo pers. comm. 2006). Because, the researcher serves more as a facilitator than a leader, everyone participating in the process is involved in the research, education and action.

By choosing to undertake a community-based participatory action research project, I recognized and respected the fact that those who reside in a particular community get to know more about it and have more effective ways of making sense of their world than would be possible for myself, as a visitor. As is the case in many other communities, there are community members in Ahousat who are experts in the specifics of the situation and know from personal experience how things work, how the elements are connected to each other, and how values and attitudes, local culture, and local knowledge interact. Research approaches were selected that would help community members to recognize their own strengths and resources.

In contrast to the conventional arrangement of research, in using a PAR approach I served as a facilitator of the process, listening to and encouraging ideas, but allowing the participants to take the lead. For example the re-creation of the traditional garden would not have been possible without the extensive knowledge of and guidance from the Ahousaht elders. Though I am by no means an expert in Ahousaht ethnobotany, nor in traditional root gardens, using a PAR approach allowed me to act less as an expert and more as a facilitator or coordinator, ensuring that as much of the relevant expertise as possible from all over the community is gathered and shared. Since much of the knowledge and practices related to traditional root gardening are no longer as well known, gathering, compiling and making additional resources about the subject available became an important element of the project. As a facilitator, I could help bring in expertise and other resources and support from outside the community (Whyte 1991). In this role, I also helped to initiate the project, guide in the selection of methods, and support the participants in considering the human and financial resources available.

Although PAR does not require a specific established methodology, the ethics and goals of the research approach do guide how the research should be conducted. Richard Atleo confirmed this idea to me, when at one point in the project I was feeling confused and discouraged about how to balance the timelines of the community and those of the University and external funding sources. I asked Richard Atleo for advice about this

situation and he responded, “*Do what seems good in your heart to do*” (pers. comm. 2006). This was an invaluable affirmation to me that the relationships and friendships I was developing were on a personal level and very much based on trust and sincerity. It served as a reminder, that in addition to following community and university protocols, I also needed to use my judgment and make decisions and choices that I was comfortable with. Having Richard Atleo’s perspective, and a committee open to the idea of letting the project evolve and change depending on the interest and enthusiasm of community members was invaluable. As is the case with many PAR projects, although the establishment of the garden did provide a situated end result, the process is actually as important as the final product.

3.3 Developing the Project - community guidance and involvement at all stages

As mentioned previously, Richard Atleo and Nancy Turner were instrumental in the initiation of this project. As a member of the Ahousaht First Nation, Richard has a strong desire to highlight, support and nurture the many strengths within his community. The original idea for the project evolved over a number of years, through discussions and suggestions from Nuu-chah-nulth community members, including work with previous graduate students Juliet Craig and Robin Smith. Douglas Deur’s previous work on traditional root gardens of the area and his discussions with Richard Atleo about these gardens was also a key component in developing the research ideas.

In addition to obtaining formal approval from Ahousaht *Hawilth Umeek* (Dr. Richard Atleo) and the Ahousaht Chief and Council (see Chapter One), I met with students and teachers at Maaqtusiis School, the staff from the Holistic Centre and the Youth Centre, attended an Elders’ meeting, and spoke with numerous individuals in the Ahousat community to ask for advice and ideas. In June 2006, I attended Beach Day in Ahousat – an annual community celebration to mark the end of school through a communal day of fun and sun at the beach. Staff at the school had suggested that Beach Day would be a great time to organize a traditional steam pit cook, and it was! I brought along a ‘pit-cooking recipe’ (see Appendix F) that was modified from traditional Ditidaht cooking style and shared with Nancy Turner by Mrs. Ida Jones of the Pacheedaht community at Port Renfrew. It was a wonderful surprise to discover that one of the

teachers at the school is Ida Jones' granddaughter. Using Ida Jones' recipe, we dug a pit down at the beach and cooked a variety of root vegetables for people to taste. The steam pit served as an important venue for discussions about the *λ'aayaʁas* Project. Community members of all ages offered ideas, suggestions and direction, all of which have been invaluable in the development of the project. For example, many people suggested that they would like to see paid work experience opportunities for local youth to assist with the project. As a result we sought and secured the resources (see section entitled *Financial support* for more information) to hire summer students, with positive results both from the students' perspective, for the community and for the project.

The implementation of the *λ'aayaʁas* Project began shortly after the spring steam pit cooking event. Consistent with participatory action research, the development process continued even as the *λ'aayaʁas* Project was being implemented. The summer students and I were constantly responding to feedback, taking notice of what worked and what did not, in order to make the project more productive, informative, and relevant to the community. As the project progressed, many changes were made and new ideas were constantly incorporated.

During the course of the project, I regularly met with the summer students and other community members both formally and informally. In 2006 and 2007, I visited Ahousaht almost monthly. In 2006, staff from Maaqtusiis School very generously let me stay in one of the staff housing units that was vacant for the summer. During this time, I spent approximately four days a week in the community. Almost all elements of the project were easier to facilitate when I was staying in the community and did not have to worry about the details associated with traveling in and out on a daily basis. I also felt far more in tune with the community and the day-to-day events when I was there more frequently.

Throughout the project I was constantly reminded of the importance of visiting the community on a regular basis. Not only was this a respectful way to proceed, but the personal connections were highly beneficial to the project's development. It was great to connect with people in person; a conversation over tea at Cathy's Place simply couldn't be replaced by an email. All of the ideas presented in the remainder of this chapter were based on initial and ongoing discussions with Ahousaht community members.

3.3.1 *Financial support*

Early in the project's development it became clear that there were elements – such as the cost associated with hiring research assistants and traveling to the Atleo River and other remote locations – that would require financial support. Based on suggestions from the community, I prepared funding proposals to help secure the resources required to support the project. Draft grant proposals were sent to the Council for review before submission, to confirm their approval and support. I was very grateful to receive financial support from EcoAction Canada, the Clayoquot Biosphere Trust and Evergreen Canada. This funding covered the costs associated with student wages, travel, honoraria, refreshments for volunteers, garden materials, educational resources and the design and production of an educational poster. These elements are discussed in further detail in the following sections.

3.3.2 *Elders' Involvement*

In Nuu-chah-nulth culture, “Elders (*Ahiipit*) are regarded as ‘doctors,’ ‘historians,’ and ‘professors.’ Elders are highly regarded individuals who are accorded an elevated stature and the greatest respect” (CLARET 2003:22). Many knowledgeable Ahousaht elders shared their time and wisdom with us. Richard Atleo, as a major advisor both for the academic side and the community side of the project, provided continuous guidance, direction and local knowledge. Trudy Frank, Lena Jumbo, and Dave Frank contributed their knowledge about the uses and traditional management of plants, Ahousaht philosophies and many other ideas, as well as feedback and advice about the *λ'aayaʒas* Project itself. We hoped that having local youth participate in the interviews and discussions would give them opportunities to connect with their elders and learn about their traditional foods and territories. After interviewing the elders, the youth commented on how knowledgeable their elders are, and how “neat” it is to hear them talk about the things which they know so deeply and are so passionate about. It seems important, in today's society, to create opportunities for youth and elders to connect. Our lifestyles are changing so fast, that it is often hard for different generations to understand one another and find common interests (Turner *et al.* in press, Thompson 2004).

There are many knowledgeable elders in Ahousat. Although we were able to speak with only a few, we hope that there will be many opportunities in the future to facilitate further discussions and learning opportunities between generations.



Figure 3.1: Jen Pukonen, Ahousaht elder Trudy Frank, and summer student Janelle Louie

3.3.3 *Selecting a location*

Originally, the Atleo River, which is a twenty-minute boat ride from Ahousat, had been suggested as the main location for the root garden. It is the focus area of Richard Atleo's *hahuuli* responsibilities, and known to be a traditional root garden site (Craig and Smith 1997). However, after numerous discussions with community members and my graduate advisory committee, it became clear that a demonstration root garden in Ahousat would be far more accessible and as a result would be more beneficial for the community in terms of educational opportunities and raising peoples' awareness about the roots and traditional root gardens. In the end, we decided to build the *λ'aayaʕas* garden at the Ahousaht Holistic Centre in Ahousat and also tend to and monitor a 'shadow garden' at the Atleo River Estuary, where the root vegetables grow naturally, so that we could observe the effects of our management practices in a more systematic way. The Atleo River research is described in detail in Chapter four.

Although the site we chose in Ahousat would not necessarily have been a traditional garden site, the garden we created there is accessible, beside the Holistic

Centre, which is recognized as a safe and supportive setting in which people feel welcome. It is also close to the school, providing convenient opportunities for educational activities relating to the garden. During the process of selecting a site, the value of local knowledge became increasingly clear. For example, at one point it was suggested that we consider building the garden on a site that we later found out had experienced an oil spill a number of years ago – obviously not a suitable setting in which to grow vegetables. However, because not everyone in the community was aware of the spill, if we had only spoken with a few people this detail could have been easily missed. For this reason, before making decisions we tried to run our ideas past a number of different people within the community, in hopes of gaining more balanced and representative ideas and information.



Figures 3.2 and 3.3: Before and after pictures of the Ahousaht Holistic Centre and root garden



3.3.4 The Root Plants

Three species of edible indigenous root vegetables were chosen for the garden in Ahousat because of their importance as a traditional Ahousat food source, because they often grow together in both cultural and natural settings, and because these were the species best known as being tended in Nuuchah-nulth estuarine root gardens in the past (Deur 2000, Turner and Efrat 1982, Turner et al. 1983). *ʕaʕiicʕuqmapt* (Springbank clover, *Trifolium wormskioldii*), *tlicyʕupmapt* (Pacific silverweed, *Argentina egedii* spp. *egedii*) and *kuuxwapiihmapt* (northern rice root *Fritillaria camschatcensis*) are often harvested together, and traditionally – at least the clover and silverweed – were prepared in the same way¹. The recent designation of these culturally and ecologically important native plants as ‘endangered foods’ has stimulated an interest in their potential use for renewed local consumption and restoration projects and in celebrating cultural and ecological diversity (Nabhan and Rood 2004; Nabhan 2006).

Shitlaa (Bracken fern rhizomes, *Pteridium aquilinum*), another traditional Nuuchah-nulth root vegetable usually harvested from the forest, was not chosen for the garden because there is recent evidence that parts of the plant may have carcinogenic properties and for this reason they are not recommended for consumption (Turner 1995). The bulbs of *kwanʕus* (Blue camas, *Camassia quamash*) were also eaten by the Nuuchah-nulth, but it was not planted in the garden because it does not naturally occur on the west coast and it is not known to have been a common root food for the Ahousat. The bulbs were usually traded from Southern Vancouver Island, although there are also reports of camas bulbs that were brought to the Hesquiaht area about 100 years ago and planted in the meadow behind the village (Turner and Efrat 1982). According to Luke Swan *kwanʕus* also grew at the mouth of the Megin River, but presumably was planted here as well (Bouchard and Kennedy 1990:296).

In spring 2006, I enrolled in a course through UVic’s Restoration of Natural Systems Program entitled ‘Selection and Propagation of Native Plants for Ecological Restoration’ to help provide me with information on native plant propagation. I selected propagation materials from clover, silverweed and riceroot populations that were in

¹ More detailed ecological information on the edible root species is included in Chapter Four.

relatively close proximity to the garden site, because there is substantial evidence that using collection sites as closely matched as possible to the restoration site in terms of geographic location, climate, soil, and matrix vegetation is beneficial. These plants are likely better adapted to grow in the locality, and their genetic composition will be similar to that of local wild populations (Meyer and Monsen 1992).

Propagation materials that were used are as follows:

- Springbank clover seeds were harvested from Cow Bay on Flores Island.
- Root fragments from Pacific silverweed were also collected from Flores Island, as well as from the Esowista Peninsula. The root fragments were collected with permission from private property owners.
- Northern riceroor bulblets were harvested from Kingcome Inlet and given to Nancy by Chief Adam Dick (Kwaxistala).
- In addition, some mature Northern riceroor plants were ordered from Streamside Native Plants in Bowser on Vancouver Island.



Figure 3.4: Propagation trays



Figure 3.5 (left): Preparing the garden site
 Figure3.6 (right): Northern riceroor sprouting in the garden

3.3.5 Engaging Youth

As noted previously, initial discussions with Ahousaht community members indicated there was a strong desire to engage students and youth in the *λ'aaya Sas* project, ideally as part of a work experience. Over the season, six high-school students – Kara-Anna Adams, Dion Keitlah, Austin Keitlah, Kayla Little, Lorne Little and Janelle Louie – were hired as research assistants to help with the project.



Figure 3.7: Student researchers Janelle Louie, Kayla Little, Dion Keitlah, Swan and Austin Keitlah

All of the students who worked on the project were asked to complete two forms together with their parents - an employment permission form (for students under 15 years of age) and a consent and waiver form. The informed consent forms provided information about the *λ'aaya ʃas* project and also discussed the possible risks involved in doing fieldwork in remote locations. This permission process was important because not only did it provide the students and their parents with information about the project, but it also provided me with up-to-date contact and health information for the students in the case of an emergency. As part of the students' training, at the beginning of the season, I reviewed our safety procedures with them, and discussed a number of different scenarios including: what we would do if someone was to get hurt, if we encountered a bear, if we needed to contact a boat, etc. The students all took their responsibilities seriously, and we felt very lucky that we had a safe and rewarding field season.

Through the fieldwork the youth also developed and enhanced skills in research, communication, and educational programming and built on their knowledge of traditional

plant foods, the natural environment and Nuu-chah-nulth culture. The students helped to prepare and build the root garden at the Holistic Centre, interviewed Ahousaht elders, tended to and monitored garden plots at the Atleo River, coordinated community steam pit cooking events and helped develop an educational poster about Nuu-chah-nulth root gardens and the *λ'aayaʒas* project.

It was important for me as a visitor to the community to have Ahousaht youth participate in the discussions with elders about the project. Although I do feel a deep commitment to the community, at the end of the day, it is not my home and I feel that it is critical that these important stories and lessons are passed on to local youth; this is the best way to keep the knowledge alive. A major benefit of the project was to provide opportunities for the youth to connect with their elders and in turn to facilitate the transmission of traditional ecological knowledge.

We also hoped that the project would foster in the students an awareness and appreciation of the environment of their home place. Field trips to the Atleo River and other sites gave them a chance to get to know different areas within their traditional territory and to connect with the plants and animals that live there. We all agreed that it was a treat on these trips to get a way from our 'day to day' routines, and to be able to take the time to learn about and observe all of the life around us. The field trips to the Atleo were definitely a highlight in this regard!

3.3.6 School involvement

Early in the project's development I attended a staff meeting at Maaqtusiis School to introduce the *λ'aayaʒas* Project and to ask for ideas and suggestions. There were many different thoughts and ideas as to how to involve the staff and students as well as what sort of resources coming from the project would be most useful for the school. As the root garden project encompassed a variety of activities, it worked well to involve students of different ages, from different grade levels. For example, the grade one class came down one day and the children helped to pick out sticks and stones from the garden. This activity gave them an opportunity to visit the garden and learn about the Nuu-chah-nulth root vegetables and also to help maintain the garden in an effective way. Other classes

were involved in helping to plant the root vegetables and, as mentioned below, in painting the mural and coordinating and hosting steam-pit cooks.

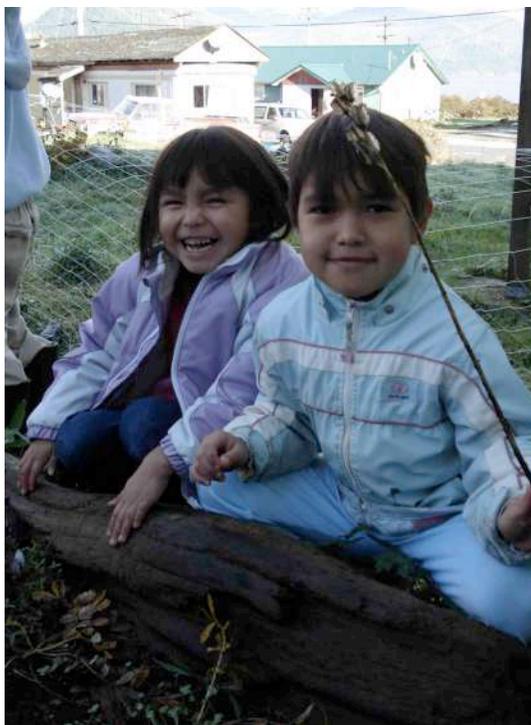


Figure 3.8 (left): Grade one students helping at the garden
 Figure 3.9 (right): Grade four class helping with a steam pit cook at the Ahousaht Youth Centre

Involving youth in action-oriented environmental projects enhances their values of environmental responsibility, and exposes them to their natural environment, engendering life-long learning (Louv 2005; Nabhan and Trimble 1994, Raincoast Education Society 2007).

3.3.6.1 *Root Garden Resources for the school*

While we were developing the garden, people suggested that a poster would be an effective way of sharing the information about Nuu-chah-nulth root gardens as well as raising awareness about the root garden project. At the end of the summer season, the research assistants and I worked together to prepare a draft of the poster [see Appendix H: Root Garden Poster]. We decided to use the title *Nuucaanul Mulmumc* (Nuu-chah-nulth Roots) for the poster, because Trudy Frank explained to us that like in English, the

Ahousaht word *Mulmumc* "...means roots, but you can refer it to plant roots or you can refer it to your roots... where you come from." In developing the poster, we tried to include answers to all of the most common questions that we were asked while working on the garden, as well as other relevant information about Nuu-chah-nulth root vegetables. When we began to write the text, we realized how hard it was to write about a concept that is usually taught through hands-on experience. Considering this, as well as the cost and time associated with producing a poster, made me wonder if we should be making this poster. I wondered if, instead of working on a poster, it might just be better to focus on creating opportunities for the students to visit and work in the garden. However, when we asked teachers from the school for their opinion, while they agreed that it was invaluable for students to have the opportunity to learn about their environment and culture through hands-on experience, they stressed that the development of culturally relevant school curricula and resources such as the poster was also extremely important.

Maaqtusiis students, like many students across BC, spend the majority of their school time inside a classroom and unfortunately, First Nations are generally underrepresented in the educational resources available in the schools (Thompson 2004). In response to these comments from the teachers, we went ahead and developed the poster, with the concept of it being a poster *about* Ahousaht, *for* Ahousaht. Ideally it will help to spark an interest among the student body in these traditional Ahousaht plant foods, and will complement the more traditional ways of conveying important cultural knowledge, through songs, stories, art and experiential learning.

Collaboration with the school will be ongoing, as we continue to explore ways to incorporate the maintenance and care of the garden into the school curriculum. In response to requests from teachers, I am working with Maaqtusiis School and the Raincoast Education Society to develop a 'school program' about the root garden to provide teachers with background information and potential activities that would enable them to take their classes to the garden and involve them in its maintenance. Although some of the teachers are long-term members of the community, many are not, and as a result there is a high turnover rate for teachers at the school. For this reason, for continuity in the garden's care, it was important to engage resident community members in the project and also document the programs that we worked together on, so that

resources will be available for new teachers in the future. There was significant interest in the project from a number of teachers at the school. Some of the teachers who are not from Ahousat, however, explained to me, that they often do not incorporate Ahousat traditional knowledge in their teaching, because they don't feel they know it, or know how to convey it in an appropriate way. Hopefully, the resources we developed around the root garden can provide these teachers with information and ideas to help them feel more comfortable in incorporating important local knowledge in their curricula, including bringing in knowledgeable community members to help deliver lessons. In her thesis about the Intergenerational Transmission of Traditional Ecological Knowledge Using School Science Curricula, Judy Thompson (2004:10) notes: "Science curricula relevant to First Nations can help both First Nations and non-First Nations teachers feel more comfortable and confident in bringing traditional ecological knowledge into their classrooms." As well, she mentions that, "First Nations students need to see that learning about their people's ways of knowing belongs not only in social studies, art, First Nations Studies, or language courses, but also in science courses and that it is viewed as legitimate science knowledge" (Thompson, 2004:11).

Over the field season we also created a root garden resource bin, with garden tools (shovels, gloves etc.), field guides and other resources that we found useful in working on the garden. This bin will be left at the school as a lasting resource for students and teachers.



Figure 3.10: Root garden resource bin

3.3.7 *The mural*

One day, while the students and I were out weeding in the garden, someone walking by suggested that we should paint a mural on the wall of the Holistic Centre beside the garden. We all agreed it was a great idea – the wall was plain white and the paint was getting old. But, who was going to do it? The students mentioned that they knew some artists and would help spread the word about this idea. And, before we knew it, George John, a teacher from the high school, said he would be keen to work on the mural with his outdoor education class.

When they asked us if we had a theme in mind for the mural, we explained the idea of the root garden and said that they would be welcome to design whatever they thought would be a good fit. They decided to paint the Atleo River estuary – a place where the root vegetables grow naturally today, and were likely tended and harvested in the past. Together, George John and the grade nine/ten outdoor education class worked to design and paint a beautiful mural. With rainy weather and short class periods to devote to the work, it took quite a few weeks to complete the mural but the students persisted and in the end, I think they were really proud of the result. While the students were creating the mural, we were frequently warned that it might be vandalized. However, over a year has passed since it was completed and no damage has been done. I think this is likely due to the fact that the students who painted the mural were proud of their hard work and their friends respected that. Not only did the project provide the class with the challenge of researching, planning and implementing a project as a team, but the mural, as with other such projects, provided the students with “...a chance to make a lasting, and highly visible, contribution to the well-being of the community” (Delgado and Barton 1998:15).

Although the mural may not have seemed to some to be directly related to the root garden, it was a good reminder that everything is connected. There are a number of beautiful murals in Ahousaht and people really value and appreciate them. They are a reminder of the vibrant and creative community and provide a ‘canvas’ for people to demonstrate knowledge of their history and pride in their cultural heritage (Delgado and Barton 1998). According to Holscher (1976-77:43), “murals . . . are newspapers on walls and a wealth of information is contained in them.” In this case, the wall of the Holistic

Centre was transformed into a story of Ahousaht *mulmumc* (roots).



Figure 3.11: Students from the outdoor education class painting the mural

3.3.8 *Diverse ways of learning*

Extensive research has shown that people have many ways of learning. To respect and support the diverse talents and styles of learning within the Ahousaht community we tried to include a range of different activities through which people could learn about traditional root gardens and contribute their expertise.

For example, a local weaver, Roberta Adams taught a workshop on how to weave cedar bark mats. In the past, the mats were used to kneel on while harvesting the root vegetables and they also provided a place where damp or muddy roots could be laid out to dry (Turner 1995).

The broad scope of the project created opportunities for people to have hands-on experiences planting and tending a traditional root garden, preparing and tasting the root vegetables it produced, as well as talking, writing, reading about, painting and photographing the traditional root vegetables and their associated habitats.



Figure 3.12 (left): Janelle Louie weaving a cedar bark mat, Ahousaht Youth Centre
 Figure 3.13 (right): Ladybug on silverweed, photo by Ahousaht researcher, Kayla Little

I was reminded of the importance of different styles of learning when I painted some of the flowers of these species for a thank you card. I had read quite a bit about the botanical structure of the plants, but until that point I found it difficult to remember the details. However, after painting the plants I was easily able to explain what they looked like to others. I obviously responded better to a more visual way of learning than to simply reading the information.

3.3.9 *Steam pit cooking*

As described in chapter two, pit cooking was one of the ways in which the Ahousaht root vegetables were traditionally prepared. Holding a steam pit cook event for community members was an effective way to learn and share stories about traditional foods, and also for people to enjoy a healthy meal. The pit cook is a wonderful activity for people of all ages. There is something for everyone to help with. The pit must be dug, a fire lit, rocks gathered and heated, salal and fern fronds gathered, and food prepared for

cooking. Then, the hot rocks must be spread over the bottom of the pit, a post held in place in the middle of the pit, layers of salal and sword fern added, followed by the food to be cooked, more sword fern and salal, and finally, the post removed and water poured in through the channel left. The pit is then carefully covered with a mat or tarp and sand and rocks and left to steam for two or more hours. Elders can oversee the process and offer suggestions, younger children can help to gather rocks and plants, youth and adults can start the fire and help to prepare the food. And, almost everyone can participate in putting the food into the pit and taking it out when it is cooked, not to mention, enjoying tasting it. Community members can also contribute by bringing other local foods like smoked salmon, bannock and yama (salal berry) pie, to share at the meal.

During the school year at Ahousaht, the grade nine and four classes at Maaqtusiis helped to coordinate and host a steam pit cook for the community. The grade four students made up invitations for their parents and grandparents. The grade nine students helped the grade fours to gather plants, prepare the steam pit and serve the food. Before serving the food the grade four class said a *Kleco* (“thank you”) in the Ahousaht language and then, without being asked, they served all of their elders before getting food themselves. A number of community members mentioned that steam pit cooking is a great way for children and youth to learn about traditional foods, because meals provide a good time to listen and learn. Rosie Swan explained:

It is really important to talk to your children when they are eating and to make time for your children. We were taught that when you talk to them while they are eating they will swallow what you are saying with the food that nourishes their bodies.

(Rosie Swan, NTC 2007)

One of the teachers commented, “the inclusion of steam pit cooking was a great experience for the children... I think this particular class needs to do something like preparing the steam-pit and cooking the vegetables. They learned different skills, such as planning, organization, cooperation and following through with a goal in mind.” Overall, the four steam-pit cooking events that we held were extremely well received by the community, and there are plans to do more in the future.



Figure 3.14 (left): steam pit cooking with students
 Figure 3.15 (right): *Umeek* helps with the steam pit cook

3.3.10 Language

Many of the community members we spoke with were very interested in incorporating Ahousaht language into the *λ'aayaʒas* project whenever possible. The language is an invaluable part of Ahousaht teachings. As anthropologist Wade Davis (2003:np) describes, “every language is an old growth forest of the mind, a watershed of thought, an entire ecosystem of spiritual possibilities.”

Language holds important local knowledge, which can help us to better understand the myriad connections with the world around us. The Barkley Sound Dialect Working Group (2004:23) explained that language “...reflects our knowledge and ideas, and enables us to pass those on to each generation.” In harmony with this sentiment, Ahousaht elder Stanley Sam, said that “Our language is so important for our culture. You can’t tell our stories without our language” (Sam 1997:93). When languages are lost, important knowledge and lessons are lost with them. This is just one of the many reasons

why it is important to keep the diversity of languages on earth – including the Nuu-chah-nulth language – alive.

We tried to incorporate Nuu-chah-nulth language and terminology into the project whenever possible because “ecocultural restoration can both benefit from local languages and help to perpetuate them” (Turner 2005:231). Early on in the project’s development we decided that it would be appropriate to call it by a Nuu-chah-nulth name. Richard Atleo and Trudy Frank chose the word *λ'aayaʒas*. They explained to me that one literal translation for *λ'aayaʒas* would be "growing in, on, and out of the earth," but that the word also “denotes a rootedness in the earth in a similar sense as the Nuu-chah-nulth word for house - *ma-as*, meaning ‘biting into the earth,’ suggesting a tenacious and purposive rootedness to land on which the house sits...” (Richard Atleo and Trudy Frank pers. comm. 2006). This explanation was a good reminder that passing down the Nuu-chah-nulth language is an important part of sharing information about sustainable plant use and management.

When talking or writing about the root vegetables and other Ahousaht plant foods we tried to refer to them by their Nuu-chah-nulth names whenever possible. And, if we didn’t know the name for a plant we would ask people in the community and refer to other resources as well. With the help of Betty Keitlah, the Cultural Education teacher from Maaqtusiis School, we also incorporated the language into the poster that we prepared for the school. The students were always keen to learn new words and help me to pronounce them. At one of the steam pit cooking events the grade four class said a beautiful thank you in the Ahousaht language before we opened up the pit. Because the steam pit cooks are so much fun and attract people of all ages, they might also provide a wonderful way to incorporate the language into a hands-on activity. Although I am not familiar with it, I am sure that just as with the practice of tending to and harvesting the root vegetables there would also be extensive terminology related to the cooking of the roots.

3.3.11 *Volunteers*

Throughout the project many tasks arose that we needed help with. There were times when I hesitated to ask for help, because I knew people were busy, but Richard

Atleo reminded me that “...asking for help is a very strong Nuu-chah-nulth teaching.” He explained to me, “It is one of our teachings to *hupiicstalth*... to help one another” (Atleo pers. comm. 2007). This became increasingly evident through the time and energy that people in the community contributed to the project. Community volunteers helped with everything from growing the plants, to reading drafts of the poster, to building the fence. As a result, ownership of the project can certainly be claimed by the community members.

3.3.12 Incorporating ideas...

As the project grew and evolved we were constantly reminded of the importance of being flexible and open to ideas from the community. For example, at one point, someone suggested that it would be great to have a place for people to sit at the garden. Hearing this idea inspired us to find a bench. And sure enough, when we did, we were excited by the result. People who had previously passed by, just pausing to say hello, with the bench in place stopped to talk, ask questions and share their thoughts, ideas and knowledge about traditional plant foods. The bench also helped to create a space where people could sit and chat with a friend, eat lunch or simply enjoy the garden. Incorporating different ideas also lets people know that their different strengths and ideas are valued and encourages their participation.

3.4 Sharing the stories - meaningful dissemination

Dissemination is an academic term that essentially refers to sharing research results. Maori researcher Linda Tuhiwai Smith explains that “...sharing is about demystifying knowledge and information and speaking in plain terms to the community” (Smith 1999:161). Cosmos Frank from Ahousat told us that his dad used to tell him to “...speak in simple words when someone is learning, don’t use hard words, when you use hard or fancy words [that others might not understand] you are just speaking to yourself” (Cosmos Frank pers. comm. 2006). Though often overlooked, dissemination, or sharing information, is an important part of the research process. In fact, Smith (1999) argues that sharing is a key responsibility of research.

In order to raise awareness about Nuu-chah-nulth root gardens and inform people of our activities we have shared our experiences and stories through local newspapers (see Appendix J and K), VHF radio announcements, an educational poster, photo albums, presentations and slide shows, as well as through the pit-cooking events. Whenever possible, the student researchers were actively involved in sharing and communicating the results of the project through demonstrations at the garden, developing and distributing the posters, and speaking at community events. Towards the end of the project I gave a presentation and slideshow at the Ahousaht AGM (2008) to thank the community for their support and enthusiasm, to share our photos and the things we had learnt, and to provide an opportunity for people to ask questions or offer feedback. All of the comments were really positive and a number of people mentioned that they appreciated the presentation.

A laminated copy of the Nuu-chah-nulth Roots (*Nuučaanul Mulmumc*) poster is mounted at the garden in Ahousat to provide people with information about this Ahousaht food tradition (see Appendix H). We hope that the poster will also help to increase overall interest in traditional foods and inspire people to ask further questions in the community, as there are many knowledgeable people who may be willing to share information and insights. We gave copies of the poster to local schools in the region (Maaqtusiis Elementary and Highschool in Ahousat, Hot Springs Cove Elementary School at Hot Springs Cove, Wickaninnish Elementary School in Tofino, and Ucluelet Elementary and Highschool in Ucluelet), as well as to the Ahousaht Band Council, the Ahousaht Holistic Centre and Youth Centre, the Nuu-chah-nulth Tribal Council and other individuals and organizations as requested. We also gave poster copies to all of the summer students and people who helped with the project.

In addition to sharing the stories and information about the root garden and the traditional root vegetables within the community I gave presentations about the *λ'aayaʒas* Project outside Ahousat, including presentations for: the Council of Nuu-chah-nulth Ha'wiih (The Ha'wiih or their representatives of: Ka:'yu:'k't'h'/ Che:k'tles7et'h', Nuchatlaht, Ehattesah, Mowachaht/Muchahatlaht, Hesquiaht, Ahousaht, Tla-o-qui-aht, Ucluelet, Toquaht, Uchucklesaht, Tseshaht, Hupacasath, Huu-ay-aht, Ditidaht and Pacheedaht), the Pacific Estuarine Research Society Annual Meeting, the Society for

Ecological Restoration Annual Conference - Re-Imagining Restoration, Society of Ethnobiology 30th Annual Conference, the 2007 joint annual meeting of the Agriculture, Food, and Human Values Society (AFHVS) and the Association for the Study of Food and Society (ASFS) - Brainfood Conference, the 1st Aboriginal Health Research Conference at UVic, classes at the School of Environmental Studies at UVic, a youth forum at Bamfield Marine Sciences Centre and at the Clayoquot Field Station.

An important part of this research project was to ensure that all of the information and resources that we gathered would be accessible to the community of Ahousaht. I have compiled photo albums of our work in Ahousat and at the Atleo River and will be leaving copies of the album at Maaqtusiis School and the Ahousaht Holistic Centre. And, in addition to being available on-line, a copy of this thesis will be presented to the community.

3.5 Challenges

Working on a community-based project can be a very rewarding experience. Although challenges presented themselves at different stages of the project, with some creative trouble shooting and ongoing discussions with the people involved we were able to overcome them.

Coordinating and synchronizing community and university timelines was often quite difficult. At one point, it was necessary to obtain certain approvals from the community before moving forward with the project. Yet, it was clear that the councilors and other people were very busy with important and pressing issues, and so I often felt awkward asking for their time to review project proposals. However, Richard Atleo reminded me that there was community interest in the project and though things might work at a different pace from what I had envisioned, they would work out – and they did. At times it was challenging for me to have ‘one foot in the academic world and the other in a community,’ when these bodies function quite differently. In the University setting, it is expected that many details are communicated electronically. Yet, in Ahousat, faxes, phone calls and emails are not usually the most efficient or effective way of communicating. Not only is it considered more respectful to visit in person for a face-to-face meeting, especially when discussing projects that will involve the community, but it

is also more enjoyable. Although I often faced conflicting timelines, it was important for me to remember that community-based projects require time, patience and respect and that the process is as important as the final product.

Another difficult part of community-based participatory research can be ‘letting go’ of your own personal ideas and remembering that when you ask for advice and ideas they will likely be different from your own – which is why you asked in the first place. On that note, when people did start offering creative ideas and suggestions, it was also important for me to be realistic with what we could accomplish. And, it was important to remember that even if we felt we couldn’t do something, we could still acknowledge every idea and suggestion offered, and if possible help support someone else to undertake it. One of the biggest challenges we faced, and still do face, is creating a situation in which community members feel a real ownership for the garden. If the garden is to be sustained in the future, it will be necessary for community members to help care for and maintain it – to weed the invasive plants, rebuild the fence as required, and to actually use the garden as a source of roots. This can be especially challenging when the garden is not a priority for people. Although there has been a lot of interest in the garden and in the traditional plant foods, at the end of the day, people are busy with their own lives, routines and responsibilities. Hopefully, however, the resources left at the school and the involvement of summer students will help to ensure the continued care of the garden. As part of the process we had to bear in mind the possibility that the garden might not be maintained and to consider what this would mean to the project. In retrospect, I think that the garden has been just one part of the revitalization of traditional food production and regardless of whether it is maintained in the future, it has provided a valuable opportunity for learning and sharing knowledge about traditional root garden practices. The activities that many people have experienced over the course of the project will not be lost, no matter what happens to the garden in the end.

Although we had some opportunities to help link younger people with elders for learning about traditional foods, I would have liked to of been able to facilitate more occasions for youth to connect with elders. As visitor to the community, I was still learning to understand how the community works, and I am aware that it takes time to make these connections happen in a meaningful and appropriate way.

Recreating a root garden in a non-traditional setting also presented challenges. Traditionally, root gardens were usually located in intact estuarine environments, whereas the site we chose at the Holistic Centre was essentially a grassy lawn beside a building. We did find a few silverweed plants growing at the site, which made an excellent beginning to the garden's development. However, there were a number of introduced and invasive species including Himalayan blackberry (*Rubus discolor*), creeping buttercup (*Ranunculus repens*) and a number of non-native grasses. Even after we cleared the plot, the creeping buttercup quickly invaded the garden. This was of special concern because the buttercup flowers are easily confused with silverweed flowers (see Figures 3.16 and 3.17), which are also yellow and sometimes even called "buttercup." As shown in Figure 3.18, the buttercup roots also closely resemble the edible clover roots. This was a concern because, unlike the clover, creeping buttercup is actually poisonous, and like other members of the buttercup family, it contains chemical compounds that can cause "severe irritation and blistering of skin, or inflammation of tissues of mouth, throat and digestive tract when swallowed" (Pojar and Mackinnon 1994:176). The situation of the buttercup in the garden, however, presented a good opportunity to talk to people, especially the children, about the importance of being careful when eating wild plants and about not eating anything unless you are completely sure that it is safe. In addition, the buttercups and other introduced species found around the garden may provide interesting educational opportunities for students in the future to learn about and help to control invasive species in the community.



Figure 3.16: Creeping buttercup



Figure 3.17: Pacific silverweed



Figure 3.18: Springbank clover rhizomes (left) and creeping buttercup roots (right)

As well as the challenge of dealing with introduced species that were already established at the site, I was also very cautious about bringing the seedlings that I had grown at my house in Tofino over to Ahousat, out of concern for the possibility of transporting introduced species, specifically slugs. When watering the plants one night I noticed that there were a number of introduced slug species (*Arion subfuscus*, dusky slug, *Arion ater*, European black slug or licorice slug, and *Deroceras reticulatum*, Milky slug) in and around the pots. So prior, to moving the plants, I surveyed the potential garden site in Ahousat to see what species of slugs I encountered. In the end, I did find all of the same slug species that I had seen in Tofino, but still made an effort to remove any slugs from the pots before moving them. Though this may seem like a minor detail, invasive species, large and small, may displace native species and disrupt natural ecological processes. For example, in parts of Washington's Mount Baker National Forest, the European black slugs now outnumber the native banana slugs (*Ariolimax* spp.) two-to-one and possibly more, since this research was conducted roughly 15 years ago (Gordon 1994:16). In Garry Oak ecosystems on Vancouver Island, European black slugs are known to graze and damage plants such as orchids and lilies. And, in addition, it has been noted that because they eat some plants and not others, especially at the times when

plants are most sensitive, they can actually change the composition and genetic diversity of plant communities (GOERT 2003). For this reason, we chose to follow the precautionary principle at all stages of the garden's development.

3.6 Conclusions

The *λ'aayaʒas* root garden in Ahousat has provided a unique opportunity and venue for teaching about Nuu-chah-nulth food, culture and environments. Through the process of creating a Nuu-chah-nulth root garden patterned on traditional practices of tending and producing roots for food in estuarine gardens, community members of all ages – including students, parents, teachers and elders – have been engaged in learning about, sharing and renewing an important body of Ahousat botanical knowledge and practice.

Although financial resources were wonderful to have and supported many key elements of the project, we were constantly reminded that it was the time, interest and enthusiasm of community members without which the project simply would not have been possible. I also felt extremely lucky to have been working with a graduate committee who made it a priority to create a welcoming environment in which we could be flexible and adapt to incorporate the many excellent suggestions and ideas that arose from the community as the project grew.

3.6.1 Cycles of renewal

A few months into the project, as I learned more about the root vegetables I was hoping to renew, I started to notice parallels between the growth and development of the plants that I was propagating and the growth and development of the *λ'aayaʒas* project in the Ahousat community.

Different types of plants have different requirements for growth, but the basics are the same – they need soil, water, air, sunlight, space and time. Like the seeds and little plants of clover, silverweed and riceroor I was working with, I thought, each different community is unique but, again, many of the basic requirements are the same. People need information to help make informed decisions, energy to get things rolling, and time and space to contemplate and create ideas. After seeds are planted, germination can take

anywhere from a few days to a couple of months, depending on the species and the conditions. The process definitely requires patience. Similarly, community-based projects can take a while to get under way. I found the ‘seedlings stage,’ for both the plants and the *λ'aayaʒas* project, to be the most sensitive. Because seedlings are quite tender and vulnerable, it was important for me to be very attentive in the early stages of their growth, to provide the seedlings with the things they needed. Similarly, the initial stages of the *λ'aayaʒas* project required much time and attention. The energy needed to meet with people in the community, gather letters of support, write funding proposals and hire student assistants was critical for the successful development of the project.

In the growth of the plants, once they had developed true leaves and a good root system they quickly became fairly well established. They no longer needed as much attention, and began to grow and reproduce on their own. Likewise, once everyone in the community had the information and the resources they needed, the project began to grow and strengthen on its own, and in directions I couldn't have anticipated. It still felt important to help facilitate the *λ'aayaʒas* project, but it had gained its own strength after its initiation, and people ran with their own ideas. Hopefully, both the plants and the *λ'aayaʒas* project will continue to grow and develop.



Figures 3.19 and 3.20: Root garden at the Ahousaht Holistic Centre 2006 and 2007

In retrospect it seems quite fitting to consider the connections between the growth and development of both community project and the plants, when a key component of this project is about restoring and renewing our relationships with the world around us.

3.1.2 Looking ahead

We hope that this garden will help to cultivate and foster awareness of these traditional root vegetables and the diverse habitats that have nurtured the Ahousaht people and have been cared for by them since time immemorial (Turner and Wilson 2005). There is a lot of potential to expand on the garden and to continue to incorporate it into educational programs and cultural events. We hope that the garden will inspire community members to continue to learn about, revitalize and celebrate traditional foods. An ultimate goal for the *λ'aayaʒas* Project, however, is “to reduce the need for the garden – to ensure that people know the plants, their names and the associated knowledge, that the plants are healthy and productive in their original ‘wild’ settings, and that there are sufficient plant resources in the wild to provide for all the needs of local populations” (Turner and Wilson 2005:121).

Chapter 4: Revitalization of a root garden at the Atleo River Estuary

4.1 Introduction

*“Our people, our forefathers, our teacher was nature.
That was just like the ‘curricula’ of our schools today.
Everything was studied from nature.”*

Nuu-chah-nulth elder Moses Smith from Ehattesaht
(Elders Advisory Committee 1995:143)

For many generations the Atleo River has provided an abundance of foods and materials for the Ahousaht. As Stanley Sam explained the Atleo River is “a very rich place for food” (Craig 1998:54). People stayed at the mouth of the river in the fall to catch and smoke fish. At this time, they also harvested the traditional root vegetables, which are at their prime when the leaves start to die back for winter (Craig 1998). Cedar bark was harvested from the forest in the late spring; culturally modified trees still standing in some places near the Atleo reserve are testimony to this use. And, many other plants and animals, were harvested for food, materials and medicine at various times of the year (Craig and Smith 1997).

Today, lifestyles have changed significantly and although some of the Ahousaht research assistants had made previous trips to the Atleo estuary, many Ahousaht people, especially the youth, no longer have the same opportunities to get to know their traditional territories. The idea of having a ‘satellite garden’ at the Atleo River was to create an opportunity for Ahousaht youth to get out and spend time in their traditional territory, to learn about their *mutmumc* (roots), and to develop a deeper respect for the knowledge of their elders and ancestors. It was also intended to allow experimental digging and ongoing investigations of these root vegetables without concerns of possible disturbance, as might occur near a populated area.

To date there has been some documentation of the importance of root vegetables to the diet for the Ahousaht (Bouchard and Kennedy 1990; Craig and Smith 1997; Deur 2000). However, with the exception of Deur’s work (2000) there has been little study of the traditional techniques used to maintain and enhance the productivity of these traditional plant foods. Because people no longer use these roots or tend the traditional

root gardens, we decided that a limited and preliminary field experiment could provide us with some of the information necessary to revitalize root gardening knowledge and practices. At the same time, it could help actually promote the roots as a reclaimed food. We identified the Atleo as a place where root gardens could be maintained more extensively, and may serve as a focus of future management of root populations. In addition to tending to and observing the root garden plots we established at the Atleo River we also had the opportunity to harvest and taste some of the root vegetables. Through this field study, we sought connections between our own observations, traditional knowledge and existing scientific information.

We are aware that the knowledge and management techniques that have been shared with us by Ahousaht elders were developed over many generations of careful observation and practice. In comparison this project has a very short timeline. Our observations were from a limited number of trips to the Atleo River over a period of only two years. Although restricted when considered in these terms, the trips to the Atleo River provided an important opportunity for all of us to spend time there and connect at different levels with the world around us – an experience that is all too often undervalued in today’s Western industrialized society.

In this chapter I describe the methods we used to select and tend to the Atleo garden site, the observations we made on the response of the plants when subjected to traditional tending, harvesting and selection techniques and strategies. I also discuss the limitations of our study. In addition, I include other relevant experiences from our field study and discuss the idea of recovering knowledge through observation and practice.

4.1.1 Selecting a Study Area: Cultural history and ecology of the Atleo River Estuary

The Atleo River estuary is located in Ahousaht traditional territory, on the west coast of Vancouver Island in Clayoquot Sound. We selected a research site at the Atleo River based on guidance and permission given to us by Ahousaht Hawilth (hereditary chief), *Umeek*, Dr. Richard Atleo. The Atleo River lies within *Umeek’s hahuuli* (ancestral territory). The title of the Atleo River *hahuuli* was acquired through wars and handed down through many generations of Ahousaht people (Craig 1998; George 2003; Sam 1997). Earl Maquinna George explained to Craig (1998:50), that the name *Atlieu*

came from the time of these wars and it refers to the strength and other qualities of the cedar root, which can be made into rope.



Figure 4.1: *Umeeek* at the Atleo River Estuary

The Atleo watershed is a rich landscape comprised of riparian areas, old-growth temperate rainforest and more recently, logged cutblocks and some replanted tree plantations dating back to the early 1980's. The Atleo River and its estuary are situated to the northeast of Flores Island, on the east shore of Millar Channel, approximately a 20-minute boat ride from the community of Ahousat¹. From Barra Lake above, the Atleo River winds down through the forest for four kilometers before it meets the ocean - where an extensive estuary borders either side of the river mouth. An estuarine ecosystem is defined as “an intertidal community, occurring at the confluence of a freshwater source and the marine environment, and ...regularly flooded by brackish tidal waters” (MacKenzie and Moran 2004:156). The late Peter Webster explained that in earlier times the Atleo River and the estuary were known as *ts'ikt'akis*², which means triangular,

¹ The Atleo River estuary is also identified in Figure 1.1 on page 3.

² *Ts'ikt'akis* is applied to the area now known as “Seektukis” Indian Reserve No. 24

“because when the tide is high, the bay at the mouth of the Atleo River is shaped like a triangle” (Bouchard and Kennedy 1990:320).



Figure 4.2: Atleo River estuary from the air

The Atleo watershed has a long and rich history of human interaction. In the past, the area was an important fall fishing village, where people would come to catch and smoke salmon and to dig butter and little neck clams. Chum and coho are the main species caught in the Atleo although some sockeye and steelhead also spawn in the river. Both George Louie and Peter Webster remembered fish traps (in conjunction with weirs) used near the mouth of the Atleo. The remains of fish weirs have been seen in the area, but Peter Webster believed that the fish traps had not been used there since the time of his grandparents (Bouchard and Kennedy 1990:320). In June 1889, Indian Reserve Commissioner Peter O'Reilly noted that there were five houses at the river and a small potato garden as well (Bouchard and Kennedy 1990:320). There were still several houses on the North side of the river mouth in the 1920s. One of these was a large smokehouse that belonged to *kiista*, who was the father of Chief Atleo (George Shamrock). “Old Joe Titian” (t’it’i7in) and Peter Webster’s father also had smoke houses there. And, James

Swan recalled staying in a smokehouse with John Keitlah at the northwesternmost end of the reserve in the early 1940's, that was owned by John's father, *Miimixt*.

Many of the natural features have been shaped by careful interactions over countless generations of use. The remains of fish weirs and numerous culturally modified trees in the area represent just one chapter in a story of the Ahousahts' long history of sustainable resource use. Another is the estuarine habitats, producing edible roots that were harvested and likely tended by Ahousaht women. As, Trudy Frank shared with us:

These were all wild [the root vegetables], they used to go out, they knew where to pick them... Atleo was one of the places they used to go, to pick these two kinds of roots that I remember, one is like this one [ʔaʔiits'u – springbank clover] and the other one has, it's much bigger, bigger roots than this, these ones are fine, it's almost like a sweet potato taste [likely tlicy'up – Pacific silverweed]...

(Trudy Frank pers. comm. 2006)

In addition to these root vegetables, and the riceroor, which we also found growing in the estuary, the Atleo watershed encompasses a diverse range of habitats that support a variety of plants. Craig (1998) documented a total of 152 vascular plant species (not including fungi or non-vascular plants such as mosses) within the lower Atleo River watershed, many of which have cultural importance. Further and more in-depth description of the Atleo River watershed is provided in Craig's thesis, *Nature was the Provider* (1998).

The value and significance of the Atleo River area to the local Clayoquot Sound communities was demonstrated in September 1989, when more than 200 people from Tofino and the Ahousaht First Nation gathered on a logging road in the Atleo River watershed in an unsuccessful attempt to stop the clearcut logging around the river, which was considered one of the most productive salmon-spawning streams in the region (WCWC 2007; Scientific Panel 1995a). With the exception of the Seektukis Reserve at the mouth of the Atleo River (14 hectares including the small island in the bay) the lower watershed is included in a timber license, which is held by Iisaak Forest Resources (formerly MacMillan Bloedel's TFL 44) (Iisaak Forest Resources pers. comm. 2007). Though no logging has occurred in the watershed since the government's acceptance of the Scientific Panel recommendations in 1995, industrial logging activities have taken place in the watershed since the mid-1970's (Craig 1998). As a result the area has

changed considerably in the past century, and most notably, the past forty years. Reduced forest cover, habitat loss (both terrestrial and aquatic), and landslides resulting from exposed soils, erosion and road building activities have altered the ecology of the watershed. Introduced legume and grass species have also been planted to stabilize landslide areas and areas with unstable soil (Craig 1998, Smith 1997). Although much of the area has been replanted and has subsequently ‘filled in’ with new growth, the structure, composition and function of a second-growth forest remains quite different than that of a centuries-old original forest.

Despite the recent changes, the Atleo River remains a special place of great importance to the Ahousaht and especially to Umeek and his family. Some families still make trips to the Atleo River to harvest cedar bark, dig clams and fish for salmon, but many no longer go there. However, as with many other places, the symbolic relationships with the land have remained intact even though the human-resource interactions may have been lost (Beckwith 2005). When we traveled to the Atleo estuary in October 2006, Umeek spoke to us of a deep connection that he feels with this special place; for him it is alive with the history of his people.

4.1.2 Experiential learning opportunities

"Tell me and I will forget.
Show me and I may remember.
Involve me and I will understand."

(anonymous)

Included in its vision statement the Clayoquot Sound Scientific Panel concludes that “...Traditional Ecological Knowledge of Clayoquot Sound must continue to be encouraged through research and experience” (CS 1995c). Tending to a garden at the Atleo River estuary provided a unique hands-on experiential education opportunity for youth to participate in an Ahousaht food practice on their traditional territories. The Association for Experiential Education (AEE) (2007) defines experiential education as a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values. The AEE explains that throughout this learning process, the learner is actively engaged in posing questions, experimenting, being curious, solving problems,

assuming responsibility, being creative, and constructing meaning. Learners are engaged intellectually, emotionally, socially, soulfully and/or physically. Relationships are developed and nurtured between the learner and themselves, others and the world at large. By recognizing and encouraging spontaneous opportunities for learning the educator and learner may experience success, failure, adventure, risk-taking or uncertainty, because the outcomes of experience cannot totally be predicted. As a result the design of the learning experience includes the possibility to learn from natural consequences, mistakes and successes.

When following an experiential education framework the educator's primary roles include setting suitable experiences, posing problems, setting boundaries, supporting learners, insuring physical and emotional safety, and facilitating the learning process. When facilitating this process, educators should strive to be aware of their biases, judgments and pre-conceptions, and how these influence the learner. The results of the learning are personal and form the basis for future experience and learning (AEE 2007).

Most importantly, experiential education follows a similar philosophy as traditional Nuu-chah-nulth teachings. As Ahousaht elder Roy Haiyupis explains,

Children were taught a lot by example, a lot by oral tradition...We did this at home. They learned by what they saw. The elders showed them how to do it. They would say, 'this is the way to do it,' when they worked, whatever they do. We put it together bit by bit. They taught many things...

(Elders Advisory Committee 1995:52).

The Nuu-chah-nulth research assistants and myself found the written resources about these traditional root plants very useful, but we also agreed that having the hands on opportunity to study and observe the plants in their natural habitat was an invaluable learning experience.

4.1.3 *The Roots, Botanical Notes*

The site that we chose to tend to at the Atleo estuary had a high density of both *Argentina egedii* spp. *egedii* and *Trifolium wormskioldii*. Following is a brief introduction to the biology of these two important root vegetables, as well as to the biology of

Fritillaria camschatcensis, another important Nuu-chah-nulth root vegetable found growing at the Atleo River estuary.

4.1.3.1 *Argentina egedii* (Wormsk.) Rydb. ssp. *egedii*

Argentina egedii ssp. *egedii* (*tlicy'upmapt*, Pacific silverweed)³ is also commonly referred to as 'cinquefoil', 'wild sweet potato' or less frequently, as 'moor grass' and 'goose tansy' (Schofield 1989). Some people also refer to it locally as 'buttercup,' because of the resemblance of its bright yellow flowers to buttercups, but this name is misleading, especially since they are of different botanical families and buttercups are poisonous to eat. Some writers suggest that the name *Argentina* originates from the Latin *argent*, meaning 'silver' to describe the silvery undersides of the leaves (Schofield 1989). The Nuu-chah-nulth name *tlicy'upmapt* refers to the whole plant; the roots are referred to as *tlicy'up* (Trudy Frank pers. comm. 2006; Scientific Panel 1995b). *Argentina egedii* ssp. *egedii* is a member of the rose family (Rosaceae). It is not easily confused with other coastal *potentillas* because it is the only species with long runners and leafless flowering stalks that bear a single yellow flower (Hitchcock et al 1961). 'Runner' refers to a horizontally-spreading stem on the ground, that usually roots at nodes or tips (Pojar and MacKinnon 1994). *Argentina egedii* ssp. *egedii* leaves are clumped, growing from a rootstock, erect and pinnately compound (divided, with the leaflet arranged like a feather along the central stalk) (Turner 2004:140). The leaves grow to 40cm long. The overall shape of the leaf is oblong, with the largest leaflets near the top and becoming successively smaller towards the base. The leaves of the *Argentina* species are generally green on the top, and silvery underneath. *Argentina anserina* (L.) Rydb leaves bear silvery hairs on both top and bottom surfaces. This species occurs around alkaline lakes in the interior of British Columbia, where its roots are also a traditional food of First Peoples. The leaves of both *A. egedii* and *A. anserina* turn orange and then die back in the late summer and early fall, sprouting up anew in the springtime. The best time to

³ *Argentina egedii* ssp. *egedii* is also known as *Potentilla anserina* ssp. *pacifica* Howell, *Potentilla anserina* L. ssp. *egedii* (Wormsk.) Hiitonen, and *Potentilla egedii* Wormsk. Other synonyms include additional variations and subspecies that have been recognized.

harvest the edible roots is during the fall, and throughout the winter until the new shoots start to develop in spring.

The yellow flowers of *Argentina egedii* ssp. *egedii* have five oval shaped petals which grow to about 1.3 cm in length. *Argentina egedii* ssp. *egedii* is a perennial plant, meaning that it grows for three or more years and usually flowers and produces fruit each year. The fruits are flattened oval achenes growing to 2 mm long. *Argentina egedii* ssp. *egedii* also spreads widely by means of its creeping runners and forms extensive patches in sandy soil along shorelines, tidal marshes, estuarine flats, and streambanks along the Pacific coast west of the Coast and Cascade mountain ranges from Alaska to Southern California though it is less common further north. The ability to spread is an important attribute, “as it allows *Argentina egedii* ssp. *egedii* to colonize freshly exposed and deposited materials in turbulent estuarine environments – analogues to the disturbed environments created by the maintenance of traditional root gardens” (Deur pers. comm. 2008).



Figure 4.3 (left): *Argentina egedii* ssp. *egedii* in flower
Figure 4.4 (right): *Argentina egedii* ssp. *egedii* root with fall foliage

There are numerous accounts of ducks and geese feeding on estuarine roots and rhizomes and Canada geese in particular, have been noted to have a preference for silverweed roots. Similar associations between waterfowl and estuarine roots are also acknowledged in a variety of traditional stories from First Nations communities on the coast. One Haida story tells of a man who unknowingly married a goose woman. Although the village was unaware that his wife was in fact a goose, they noticed that she did not like human food and would only eat steamed silverweed roots (Bringinghurst 1999). In more recent times, Sandhill Cranes have also been observed digging up roots and feeding in patches of *Potentilla anserina* (Silverweed) in Delkatla Wildlife Sanctuary, Haida Gwaii (Hearne and Hamel 2003).

4.1.3.2 *Trifolium wormskioldii* Lehm.

Trifolium wormskioldii (*Sa Siic 'uqmapt*, springbank clover)⁴, also sometimes called wild perennial clover, or cows clover, is a small, perennial herb belonging to the bean, or legume family (Fabaceae, or Leguminosae) (Pojar and MacKinnon 1994). The Nuu-chah-nulth name, *Sa Siic 'uqmapt*, refers to the whole plant whereas, *Sa Siic 'u* refers specifically to the long, thin white edible rhizomes. As the genus name indicates, clovers characteristically have three (*tri*) leaves (*folium*) (Schofield 1989). *Trifolium wormskioldii* leaflets grow to 3cm and are finely toothed and pointed at the tip. The flowers consist of two to sixty tiny pea-like flowers per head, varying in colour from red to purple, often tipped with white, with glabrous 5-toothed calyces. The fruit is a 1-5 seeded legume or pod (Gillett 1980; Hitchcock et al. 1961). Similar to *Argentina egedii* ssp. *egedii*, *Trifolium wormskioldii* also readily propagates vegetatively, though by its rhizomes as opposed to by stolons. A rhizome is generally an underground and often elongate stem, distinguished from a root by the presence of nodes, buds of scale-like leaves (Pojar and MacKinnon 1994). As with other *Trifolium* species the rhizomes of *T. wormskioldii* harbour nitrogen-fixing bacteria and in turn enrich the soils in which the plant grows. Its stoloniferous growth form also aids in substrate stabilization and erosion

⁴ *Trifolium wormskioldii* is also sometimes referred to as *Trifolium fimbriatum* Lindl. Additional synonyms are recorded in Gillett (1980:1436).

control. The rhizomes are not only relished by people, both ducks and geese are known to be fond of them as well. The small, hard seeds are also eaten by numerous species of songbirds (USDA 2007). *Trifolium wormskioldii* can be differentiated from other perennial clovers in the region by a characteristic ‘involucre,’ a collar or jagged bract around the base of the flowering head (Hitchcock *et al.* 1961; Gillett 1980).



Figures 4.5 and 4.6: *Trifolium wormskioldii*



Figure 4.7: *Trifolium wormskioldii* rhizomes



Figure 4.8: *T. wormskioldii* seeds

Trifolium wormskioldii grows in a variety of wet habitats including mudflats, meadows, beaches, stream banks and alluvial soils. Although the *Trifolium* genus has a global distribution, *T. wormskioldii* is only found along the western half of North America, from as far north as Haida Gwaii (Queen Charlotte Islands) and the southern Alaska panhandle, south to California and Mexico, and east to the Rocky Mountains (USDA 2007; Hultén 1968).

On the Northwest Coast, *Argentina egedii* ssp. *egedii* and *Trifolium wormskioldii* are frequently found growing together in dense patches along shorelines, tidal flats and river estuaries (Pojar and MacKinnon 1995, Turner and Kuhnlein 1982). Both *Argentina egedii* ssp. *egedii* and *Trifolium wormskioldii* are commonly associated with other species such as *Juncus balticus* Willd., *Angelica lucida* L., *Triglochin maritimum* L., and *Fritillaria camschatcensis* (L.). “However, within certain microhabitats, it is not uncommon to find patches where the leaf coverage of *Potentilla* is virtually 100%, and occasionally, one can find patches of *Trifolium* that are just as dense” (Turner and Kuhnlein 1982:415). Yet, as noted by Turner and Kuhnlein (1982:415), “It is more usual to find a relatively homogeneous mixture of the two species growing together as dominants, with several other associated species.” It has been observed that, in the estuarine habitats, these two species together often form a narrow zone which is “...the most productive portion of the entire salt marsh, and indeed, is one of the most productive environments of the entire Northwest Coast” (Deur 2000:169)



Figure 4.9: *Argentina*, *Trifolium* and other species growing at the Atleo River

4.1.3.3 *Fritillaria camschatcensis* (L.)Ker-Gawl.

Although it was not growing in the plots we established at the Atleo River, *Fritillaria camschatcensis* (*kuuxwapiihmapt*, northern riceroot) is another important root vegetable that grows in other parts of the estuary, whose stems are upright and generally more visible than *Argentina egedii* ssp. *egedii* and *Trifolium wormskioldii*. *Fritillaria camschatcensis* was also one of the root vegetables that we planted at the garden in Ahousat, because this was one of the original edible root vegetables of the Nuuchahnulth.

Fritillaria camschatcensis is a member of the lily family (Liliaceae) and is known by a variety of names including black lily, chocolate lily, Indian rice, Indian potato, Mission Bells, Eskimo potato, wild potato, riceroot fritillary and Kamchatka lily. It is frequently confused with its close relative *Fritillaria lanceolata*. The Nuuchahnulth name *kuuxwapiihmapt* refers to the plant and *kuuxwapiih* refers to the large, white edible bulb. *Fritillaria camschatcensis* is a tall, herbaceous perennial. Its main bulb is surrounded by numerous, tightly clustered rice-like bulblets, each of which is a propagule that has the capacity to grow into a new plant. The stems are fairly sturdy, between 20 - 50 cm tall, and unbranched, except at the tops. The lance-shaped leaves, growing up to 8 cm long, are borne in three main whorls of 5-10, sometimes alternate above (Pojar and MacKinnon 1994, Turner 1995). Each stem can bear as many as seven dark green-bronze to purple-brown nodding flowers, which generally bloom between April and July. The flowers are slightly bell-shaped and have an odor that has been likened to 'a barnyard' (Schofield 1989). The plants are pollinated by carrion flies, which are attracted to their scent and colour (Pojar and MacKinnon 1994). The fruits are 6-angled cylindrical-ovoid capsules without wings. They produce numerous flattened, light brown seeds. *Fritillaria camschatcensis* grows readily from seed but can also be propagated by its rice-like bulblets.



Figure 4.10 (left): *Fritillaria camschatcensis*
Figure 4.11 (right): *Fritillaria camschatcensis* seed pod after a September rain



Figure 4.12: *Fritillaria camschatcensis*/riceroot bulb

Fritillaria camschatcensis usually grows in moist, grassy areas on coastal bluffs, along the upper edges of tidal flats, streambanks and other coastal habitats from Western Washington, Vancouver Island and the Fraser River delta northwards to Haida Gwaii (the Queen Charlotte Islands) and Alaska, extending across the Aleutian Islands to Kamchatka (Turner and Kuhnlein 1983).

4.1.3.4 Geographic range

The three previously mentioned perennial plants were utilized as traditional foods in much of their range. Figures 4.13, 4.14 and 4.15, on the following pages show the approximate extent of their documented traditional use on the Pacific Northwest Coast. However, their distribution has expanded since the creation of these maps based on archival and other evidence.

4.2 Selecting a research site

Before selecting the site for the garden we made exploratory walks to familiarize ourselves with the Atleo estuary and the plants that grow there and to find a suitable location for the garden plots. We found the edible root vegetables growing in patches of estuarine salt marsh on both the north and south side of the river as well as on the island in the middle of the river mouth.

The site we ultimately chose for the garden plots is located on the southeast side of the estuary. We selected the site because there was a high density and even distribution of both *A. egedii* ssp. *egedii* and *T. wormskioldii*. Although there were other sites that had visually larger individuals of these plants, they also had significantly more grasses mixed in. As our plan was to weed out varying amounts of the grasses and other competing salt marsh plants from the plots, we chose a site in which we hoped would require the least amount of weeding. Other sites would have required the removal of major quantities of these grasses and other plants. Therefore we attempted to emulate how people in the past would have selected areas on which to focus their management activities and maximize the quantity, density of and potential of the edible roots. Table 4.1 includes a list of the species found in the garden plots that we tended to and monitored at the Atleo River.

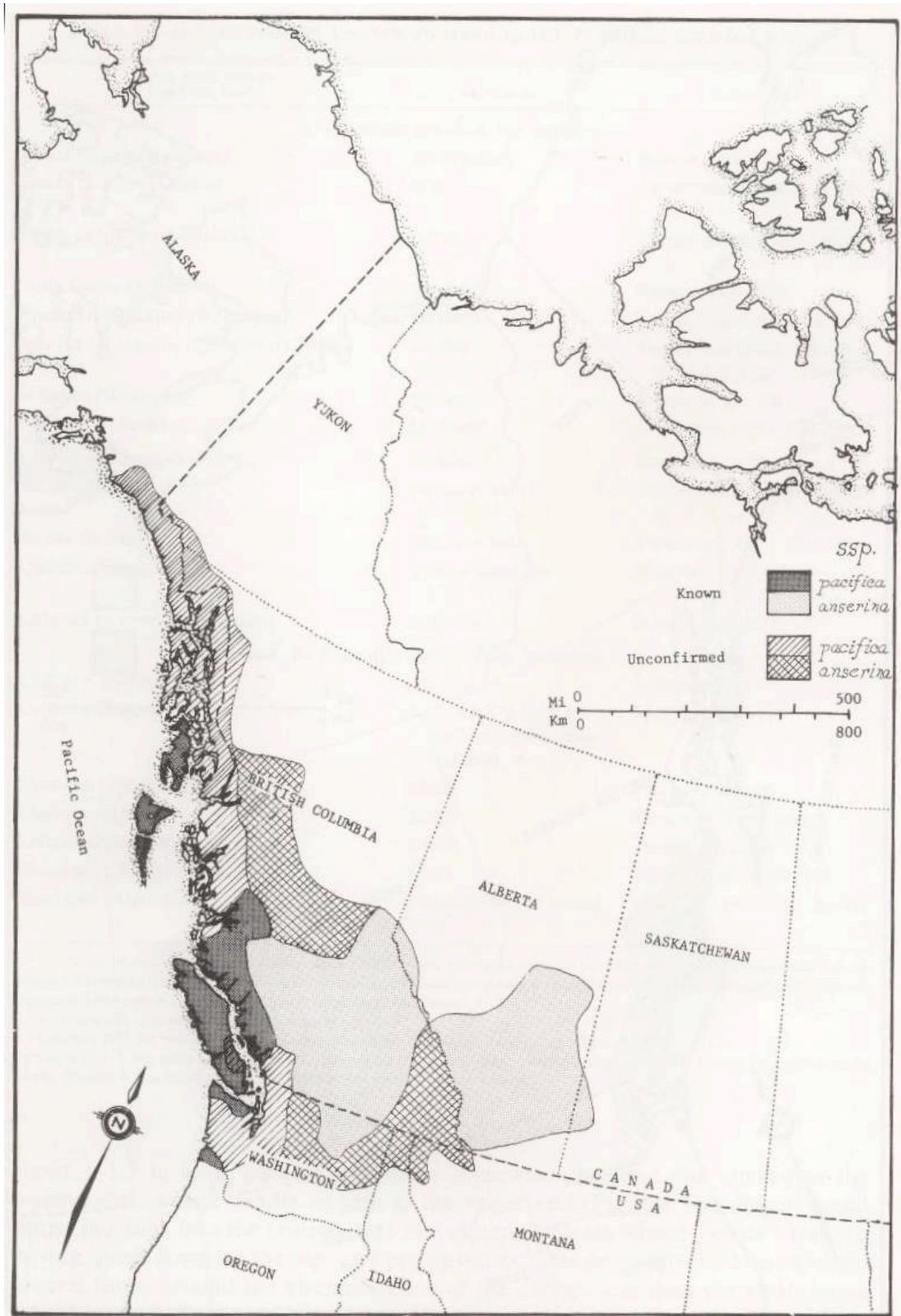


Figure 4.13: The extent of traditional use of *P. anserina* spp. *pacifica* and spp. *anserina* roots by Coastal First Nations (Turner and Kuhnlein 1982:422)

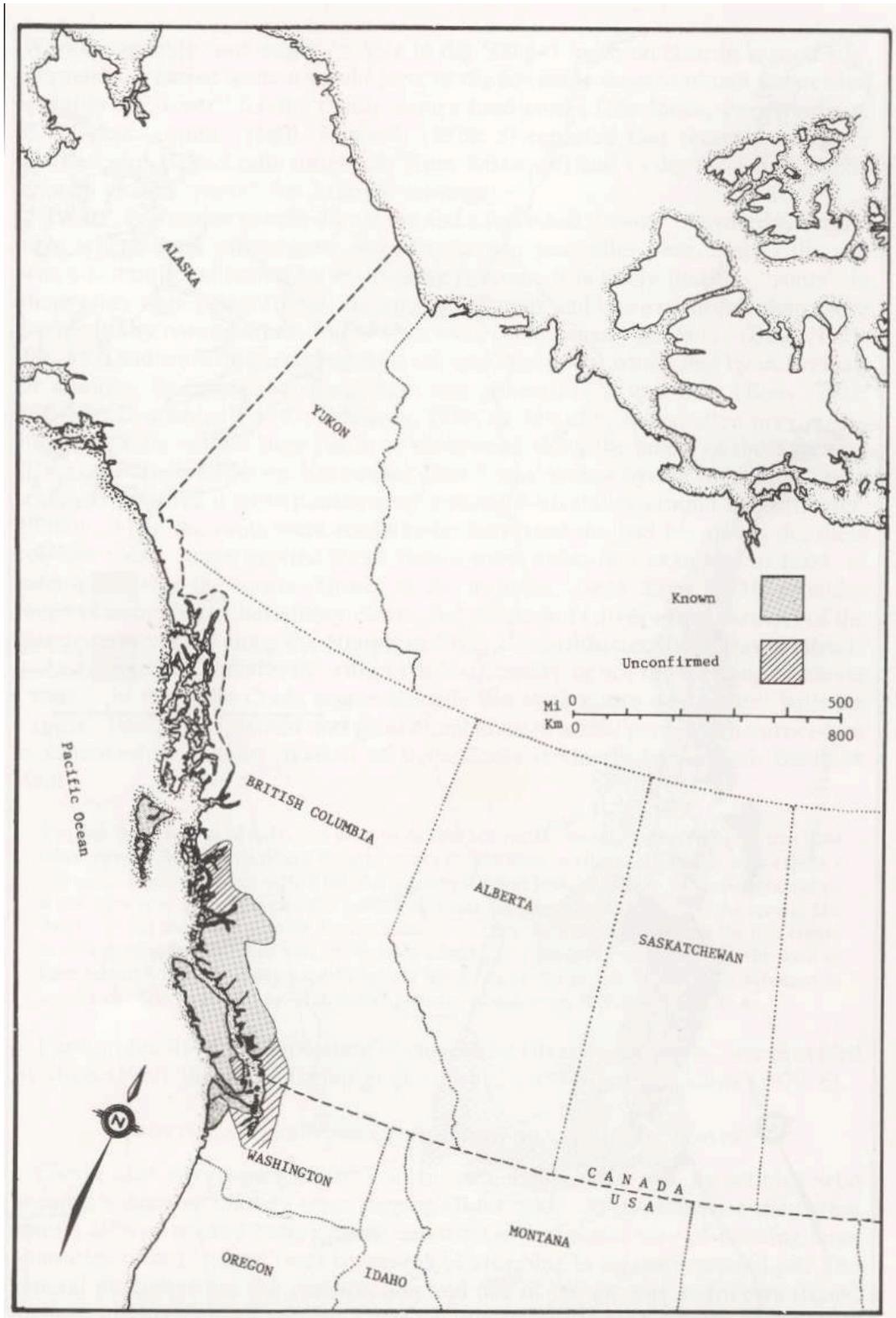


Figure 4.14: The extent of traditional use of *Trifolium wormskioldii* rhizomes by Coastal First Nations (Turner and Kuhnlein 1982:421)

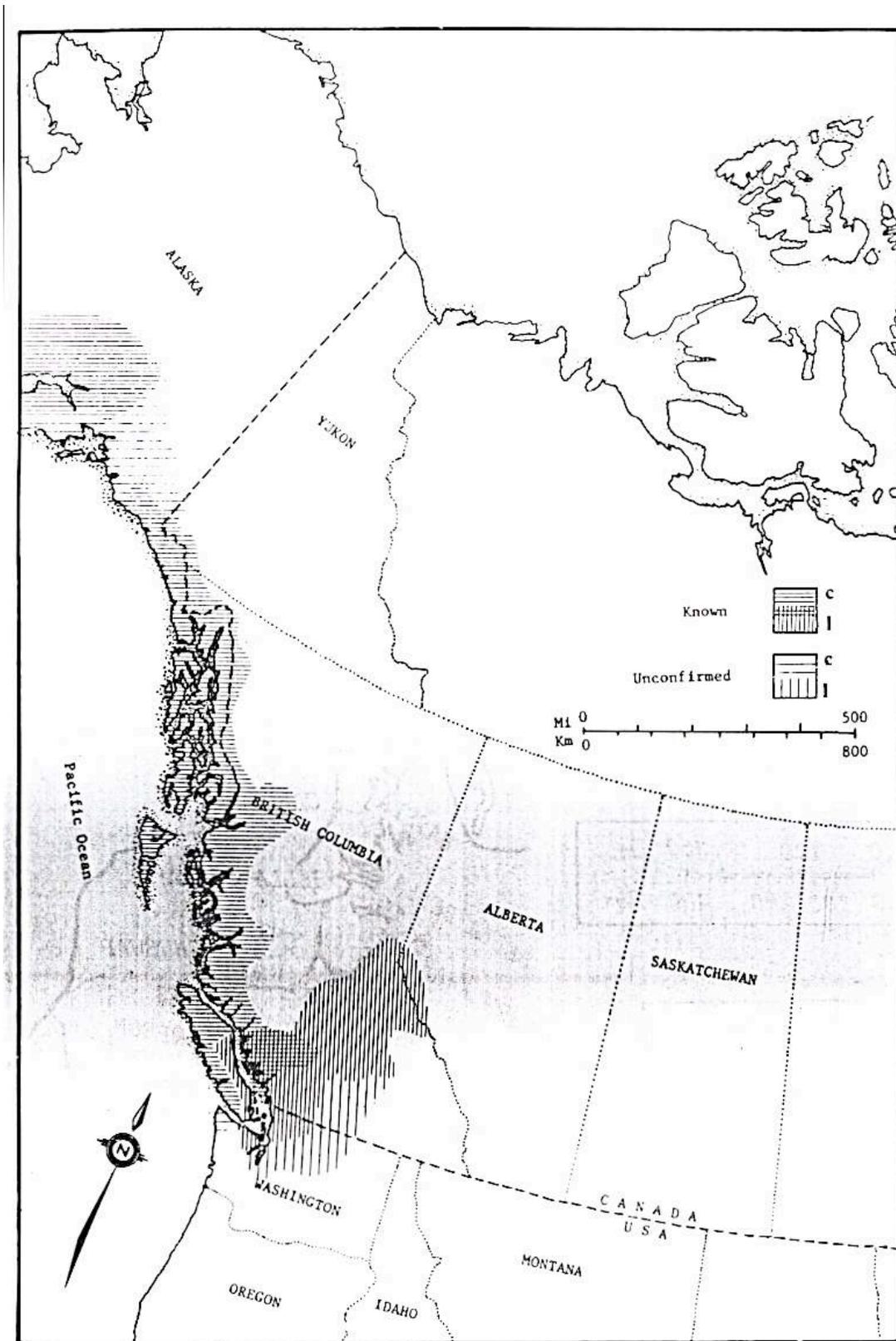


Figure 4.15: Approximate extent of traditional use of *Fritillaria camschatcensis* ("c") and *F. lanceolata* ("l") bulbs by coastal First Nations (Turner and Kuhnlein 1983:209).

Table 4.1: Species list for the Atleo River root garden plots

Species Name (Latin name)	English name	Nuu-chah-nulth name ⁵
<i>Potentilla anserina</i> spp. <i>pacifica</i>	Pacific silverweed	
<i>Trifolium wormskioldii</i>	Springbank clover	ʕa ʕiic 'uqmapt
<i>Achillea millefolium</i>	Yarrow	Shashaaxtan 'uuh
<i>Grindelia integrifolia</i>	Entire-leaved gumweed	
<i>Plantago macrocarpa</i>	Alaska Plantain	
<i>Glaux maritima</i>	Sea milk-wort	
<i>Deschampsia cespitosa</i> spp. <i>beringensis</i>	Tufted hairgrass	
<i>Elymus mollis</i>	Dune grass	Ch'ich'itapqk'uk (resembles basket sedge) hitingis7itl'aqapt (‘beach growth’)
<i>Luzula parviflora</i>	Small-flowered wood-rush	
<i>Festuca rubra</i>	Red fescue	
<i>Calamagrostis</i> sp. (mostly <i>nutkaensis</i>)	Grass	ʕaqmapt (various spp.)
<i>Carex sitchensis</i>	Sitka sedge	Ch'ich'itapqk'uk
<i>Carex obnupta</i>	Basket sedge	Ch'itapt
<i>Carex</i> sp.	Sedge	

In addition to having an extensive ‘field’ of *A. egedii* ssp. *egedii* and *T. wormskioldii*, the south side of the river was also easier for us to access because there are numerous rocky outcroppings where the water depth drops significantly, and provides safe boat access. To access the site, we were usually dropped off on a rocky point to the south of the river mouth and then walked along the shore for about 10-15 minutes. Occasionally if the tide was very high, we had to go through the bush at sections to avoid wading.

⁵ Nuu-chah-nulth names are taken from the Scientific Panel (1995b).

4.3 Methods

At the site we selected, we laid out three quadrats each 2 m². We marked the corners of each plot with an alder stake and a large rock (in case the stake was washed away during high tides or storms). Upon selecting the site, we used a visual survey (on August 22nd, 2006) to estimate and record the percentage cover of both *A. egedii* ssp. *egedii* and *T. wormskioldii* in each quadrat. Since the underground parts, not the leaves, are the edible portion of these plants, we also measured the stems per m², because we understood from oral evidence that leaf numbers may serve as a more accurate proxy than percent cover for the abundance of this food resource. We counted the stems/m² in a 0.5m² area in each plot. The average value was then calculated for each plot. Initially, the three quadrats showed fairly even percentage covers and stem densities for both *A. egedii* ssp. *egedii* and *T. wormskioldii*. In addition, we randomly selected samples of *A. egedii* ssp. *egedii* from each quadrat and measured both root length and width, since the root is the edible portion of the plant. The samples were selected by tossing a small string loop (25 cm in diameter) into the larger quadrat. The plants within the sample were then harvested. After measurements had been taken the plants were then replanted in their original location. Originally we had hoped to measure *T. wormskioldii* rhizomes as well, but we found that it was extremely hard to harvest any of the rhizomes without breaking them. And, from the author's experience, the variation in width between clover rhizomes is quite minimal and therefore would be difficult to measure accurately. For this reason, we chose to focus our efforts on measuring the roots of *A. egedii* ssp. *egedii*.

Data collected and recorded from the plots also included general comments about the characteristics of the site, including species composition, signs of animals, detritus and other notable features.

4.3.1 Applying traditional techniques and strategies

For each of the three quadrats, we applied different intensities of the same experimental treatment. The experimental treatment included weeding out various amounts of the competing estuarine plants and removing large sticks and stones from the plots. In Plot 1 we weeded approximately 60% of the plants in the plot (excluding *A. egedii* ssp. *egedii* and *T. wormskioldii*) and in Plot 2 we weeded approximately 30% of

the plants. Plot 3 was not weeded and left as a control. We completed the application of experimental treatments in the late summer, reflecting a period in which these root vegetables were traditionally managed.

We weeded the plots based on Douglas Deur's notation: "the main obstacle to the productivity of *Potentilla*, *Trifolium* and other estuarine root vegetables in this narrow band... is the presence of rocks and competing salt marsh plants (which were regularly removed from garden sites by the region's indigenous inhabitants)" (Deur 2000:168). We had originally planned to weed 100% of the competing salt marsh plants from Plot 1. However, we found the weeding to be extremely time consuming, and because of constraints of time, travel and the window of opportunity allowed by the tides, we were only able to remove about 60% of the weeds.

The following season we returned to the plots at the same time of year (August 20, 2007) and using the same techniques as applied in 2006, again measured and recorded the percentage cover and stems/m² of both *A. egedii* ssp. *egedii* and *T. wormskioldii* and root length and width of *A. egedii* ssp. *egedii* from each plot. However, after measuring the roots this time, we selected a sample of larger roots to keep and then, following traditional management techniques, fragments of the roots were replaced into the ground to allow them to propagate and grow into new plants. Complementary to the traditional knowledge and practice of replanting portions of the roots, there is also significant experimental evidence that recognizes the propagation potential of the root fragments. Both *A. egedii* ssp. *egedii* and *T. wormskioldii* are known to readily propagate vegetatively. *T. wormskioldii* spreads vigorously through its rhizomes and *A. egedii* ssp. *egedii* spreads by both stolons and rhizomes, as well as from root fragments (Turner and Kuhnlein 1982, USDA 2007)

The roots that we harvested from the quadrats were brought back to Ahousat, where we washed them and cooked them for people to sample (see the section 'tasting' for more information). We also harvested a handful (approximately 125ml) of clover rhizomes from the estuary to bring to Ahousat as well.

4.4 Field study observations and results

The following section includes our preliminary observations and results from the root garden plots at the Atleo River. Initial data shows that the percentage cover of *A. egedii* ssp. *egedii* increased in Plot 1, which was heavily weeded, decreased in Plot 2, which was minimally weeded, and did not change in the control plot. The percent cover of *T. wormskjoldii* increased in all three of the plots, but most notably in Plot 1 – the heavily tended plot.

The number of *A. egedii* ssp. *egedii* stems increased in both Plot 1 and Plot 3 and decreased slightly in Plot 2. The stem count for *T. wormskjoldii* increased in both Plot 1 and Plot 2, which were weeded and decreased in Plot 3, which was not.

The following graphs display the changes in percent cover and stem density of *A. egedii* ssp. *egedii* and *T. wormskjoldii* from August 22, 2006 to August 20, 2007. Field data were analyzed using Microsoft Excel (statistical tools package).

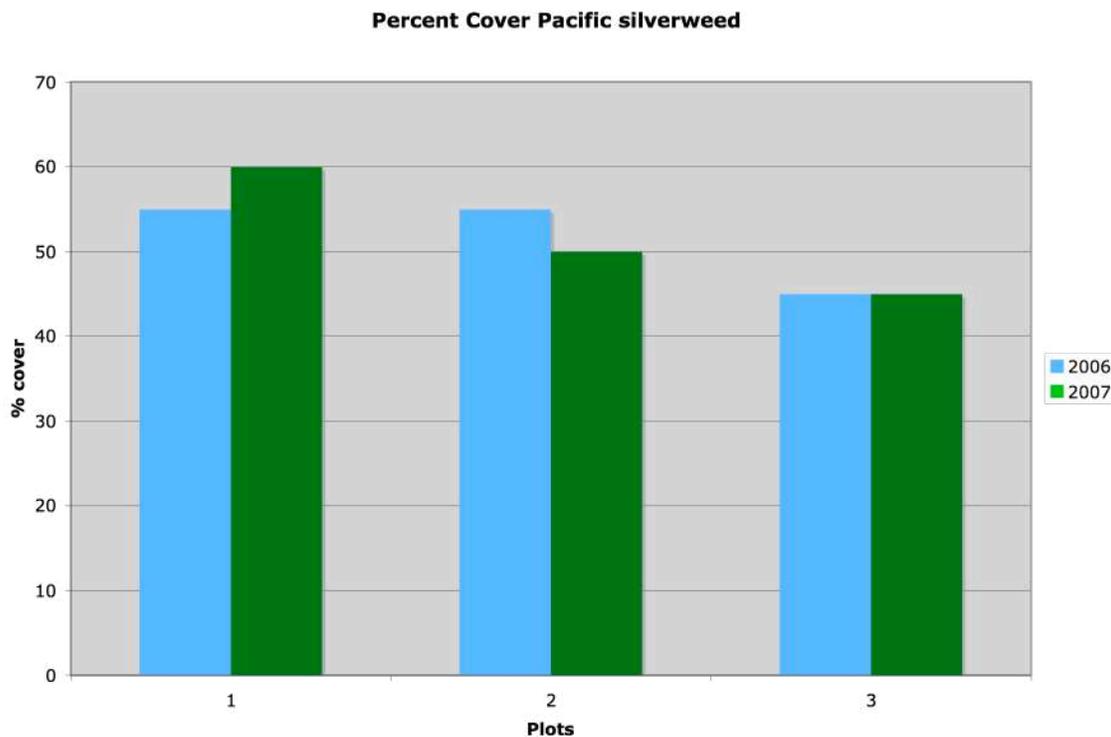


Figure 4.16: Changes in percent cover of Pacific silverweed in the plots tended to at the Atleo River Estuary

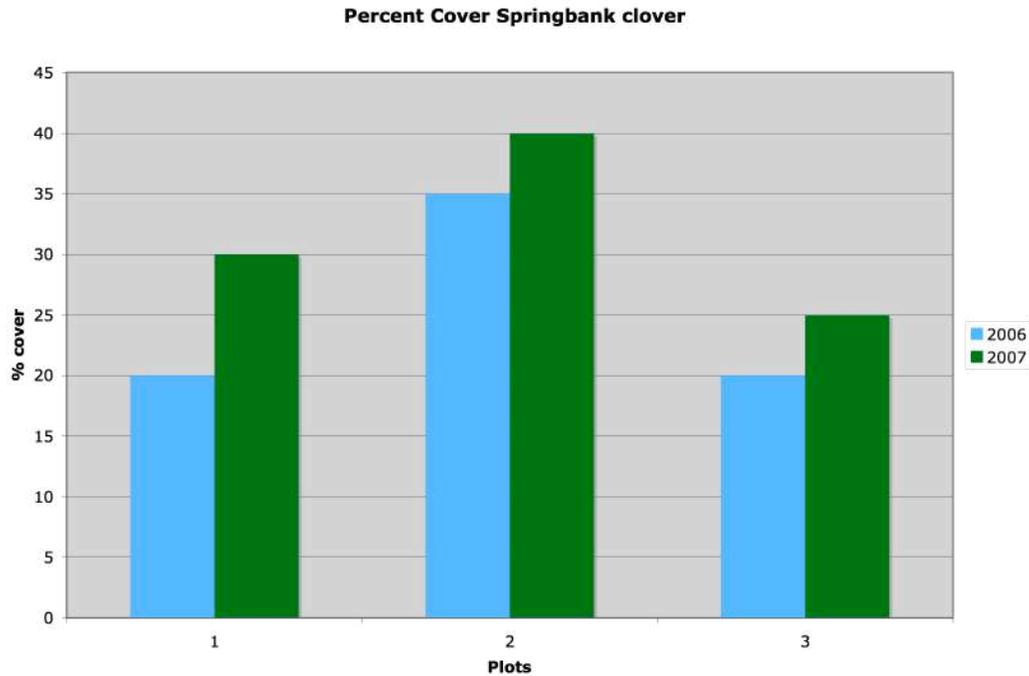


Figure 4.17: Changes in percent cover of Springbank clover in the plots tended to at the Atleo River Estuary

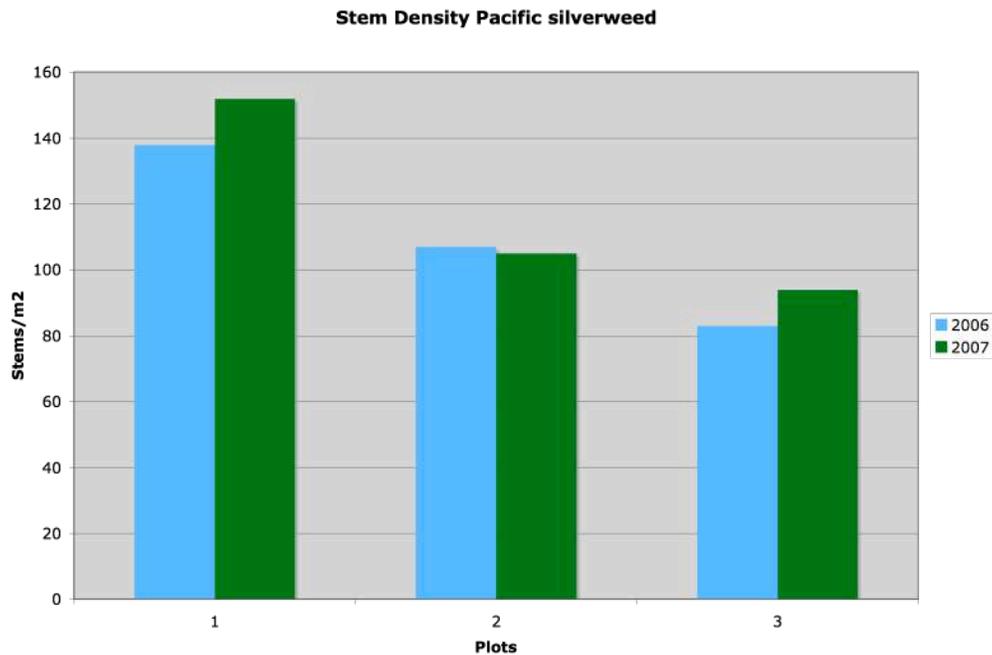


Figure 4.18: Changes in stem density of Pacific silverweed in the plots tended to at the Atleo River Estuary

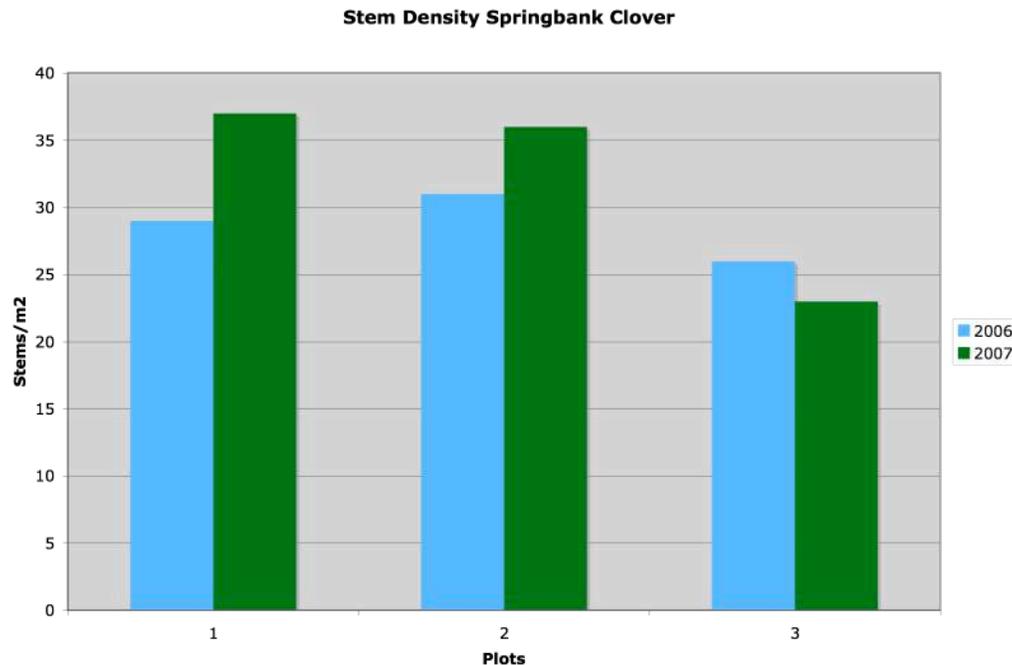


Figure 4.19: Changes in stem density of springbank clover in the plots tended to at the Atleo River Estuary

In summary, in each case, the percentage covers and stem densities of *A. egedii* and *T. wormskioldii* increased in Plot 1, which, was heavily weeded. However, it should be noted that the percent cover of *T. wormskioldii* and the stem density of *P. anserina* also increased in the control plot, and the percentage cover of *A. egedii* decreased (though minimally) in Plot 2, which was minimally weeded, which indicates that there are likely other factors influencing the percentage cover and stem density of these plants in addition to weeding. However, it is possible that through heavily weeding the competing vegetation from the first plot and as a result also ‘churning’ more of the soil, we may have created more optimal growing conditions for the two root species. As noted by Deur (2000:177) the porous structure of soils in former garden sites facilitated more prolific rhizome growth than is possible in the denser mineral soils of the unmodified salt marsh and “dense soils provide a severe mechanical obstacle to rhizome growth, limiting the size of the entire plant...” The decline in percentage cover and stem density of *A. egedii* in the second plot might be attributed to the fact that although some of the competing plants were removed, the overall structure of the soil, and therefore amounts of matted roots and other possible barriers to growth were not significantly altered. For example, it has been

noted that, as species adapted to colonize freshly exposed or deposited estuarine sediments, *T. wormskioldii* and *A. egedii* may not have much of a relative advantage until there is some threshold of disturbance that allows for rhizome/stolon expansion into unoccupied areas. Conversely, this explanation would not account for the increase in root width and length. The average length of the *A. egedii* roots increased, though slightly, in all three of the plots. However, it is important to note that the recorded root lengths may not provide an accurate measure of the full root length. Although we tried to remove the entire root when harvesting, the soil in which we were digging the roots was very dense and full of matted roots and decaying vegetation, and as a result many of the roots broke off in the mud. Nonetheless, these challenges were to be expected, considering that it would likely take multiple years of churning the soil to eliminate the root-bound condition of the marsh and provide the porosity needed for rapid growth (Deur pers. comm. 2008). The root widths, similarly increased in Plot 1 and 2, but decreased very slightly in Plot 3 – the control. The following graphs display the changes in the root width and length of *A. egedii* from August 22, 2006 to August 20, 2007.

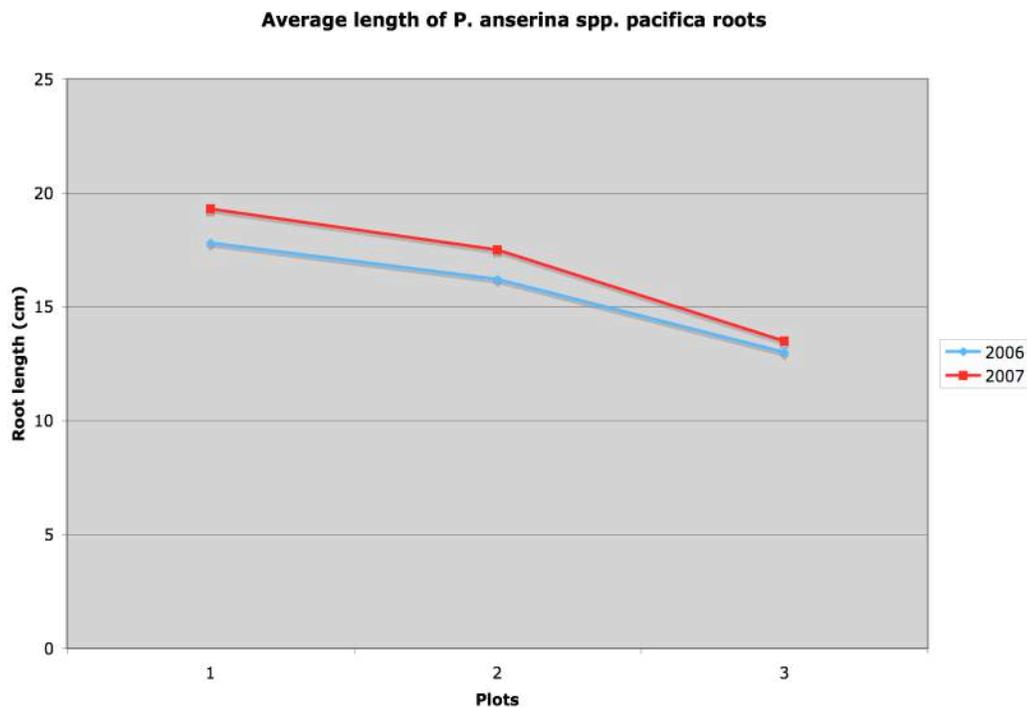


Figure 4.20: Changes in root length of Pacific silverweed (*Argentina egedii* ssp. *egedii*) in the plots tended to at the Atleo River Estuary.

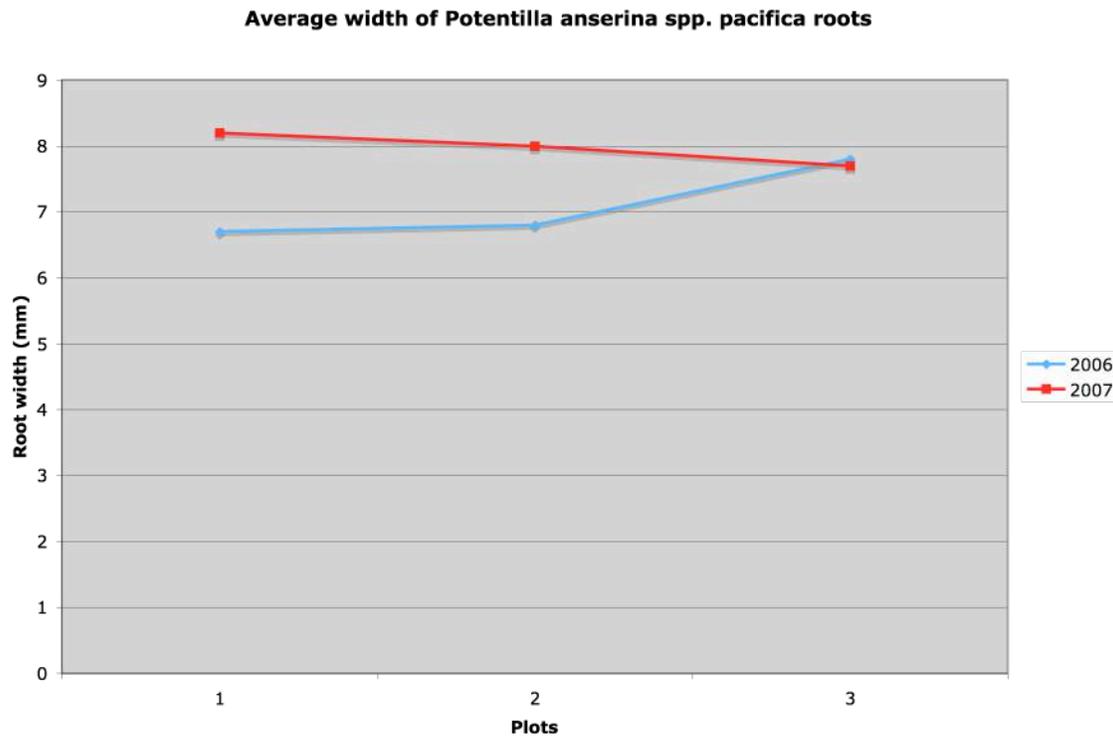


Figure 4.21: Changes in root width of Pacific silverweed (*Argentina egedii* ssp. *egedii*) in the plots tended to at the Atleo River Estuary.

With the exception of a slight decrease in root width in the control plot, the average length and width of the *A. egedii* roots increased, though slightly, in all three of the plots. As mentioned above, because of the increase in the control plots as well, it is important to consider the effect of other factors on the productivity of these root plants, as well as the limitations of our data. For example the variation in weather between the two years, which is discussed in more depth below (see limitations of data), may have also influenced the previously noted increases. The roots may also not have yet reached their maximum size. From the author's experience, the largest roots are usually found later in the fall, after all of the leaves have died back completely.

4.5 Discussion

A goal of the field study at the Atleo River estuary was to provide Ahousaht youth and myself with a hands-on opportunity to try some of the techniques that we had learned about from Ahousaht elders and from literature sources (e.g. Deur 2000) and,

ideally to give us a chance to observe first hand the effects of weeding and harvesting these roots.

Because there have been few studies done on the relationship between the extent and quality of above ground growth and size, quality and flavour of the roots of a plant, we took a number of different measurements of both above ground and below ground parts. We used percentage cover, number of stems/m², and root length and width to assess the general productivity of the plants. Using the previously mentioned measurements, the three plots which we studied on average appear to have increased in productivity as a result of applying traditional methods of tending and harvesting. Based on oral evidence and other previously recorded observations, these results were for the most part in accordance with our expectations (Deur 2000; Trudy Frank pers. comm. 2006). However, because of the limited time that we were able to spend at the site and as a result the small sample size, the differences should not be interpreted as statistically significant.

In addition, there were many other traditional management techniques that likely affected the productivity of the root vegetable gardens (Deur 2000), but which we did not have the opportunity to test. For example, the annual detritus inputs that were regularly churned into the soil, likely affected productivity. Studying the impacts of fertilizing, routine tilling of the soil and the selective harvesting and replanting of the roots, for example, would likely provide interesting insight into these practices, but would also require a more focused, more lengthy and more in-depth analysis. It is our hope that, providing direction for future research projects and the development of methodology are some of the key things this field study can offer to future endeavors.

4.5.1 Limitations of Data

There are often problems and limitations associated with collecting data during a field study. These issues are frequently related to sampling design, accuracy and reliability. When considering the observations from this study it is important to remember the problems and limitations associated with the collection and analysis of the data. For one, the size of the study plots was relatively small (only three 2 m² plots for both species combined). Initially we had considered larger individual plots of 3 m², but we quickly

realized that due to time constraints we would not have been able to weed and measure larger plots. We also concluded that, because these techniques of weeding and harvesting were new to us and we would be learning by trial and error, it would be best to test the disturbance effects on a more limited area, in order to minimize potentially negative impacts on the estuarine ecosystem, as well as for sheer practical restrictions.

In order to gain an understanding of the impacts of weeding on the root vegetable plants we measured both stem numbers/m² and percentage cover for each of the two species, Pacific silverweed and springbank clover. However, estimating the productivity of root vegetables based on stems/m² or percentage cover may result in an exaggeration of the actual number of roots. It is also important to consider that changes in percentage cover and stem density may not correspond with changes such as root size, flavour and other characteristics (such as ease of root removal etc.), which would have likely been the desired outcome of tending the gardens.

4.5.2 Access

Due to the remote location of the Atleo River, we were only able to make a relatively few trips to the site. Also, because the site was intertidal, we were able to access the plots only during low tides. Although the plots were often not fully submerged, we ended up finding out – the hard way – that our access to the plots was restricted. On a couple of occasions, we ended up wading out of the estuary in waist high water! In addition, we ended up canceling a number of planned trips due to bad weather conditions and family events that arose within the community.

4.5.3 Seasonal variation

Although we were able to take our measurements from the Atleo estuary plots at roughly the same time of year (August 22, 2006 and August 20, 2007) the weather in August 2006 varied significantly from that in August 2007 and so the calendar date may not actually reflect the same conditions. The year 2006 was relatively dry and by August, the study plants were already changing colour and had died back significantly, whereas in 2007 the plots were visibly more ‘lush.’ The total daily precipitation at the Tofino Weather Station for August 2006 was only 5.2mm whereas the total daily precipitation

for August 2007 was 109.8mm (Tofino Weather Station pers. comm. 2007). Although the Tofino weather station is some distance from the Atleo River, and the precise rainfall amounts might vary between locations, the general pattern would likely be quite similar. When interpreting our observations it is important to consider that variations in plant abundances occur seasonally, annually and on longer time scales as well. Our treatments may have been only one of several variable factors that influenced plant growth.

4.5.3 Accuracy

Another important aspect to consider in evaluating our findings is that there were six different research assistants taking measurements. Although training was provided and we frequently ‘checked’ one another’s results to verify that we were collecting data consistently, there is a possibility that different people had different biases and this resulted in variations in their measurements. In addition, because this was the first time that the research assistants had collected botanical data, we viewed this field study largely as an exercise in capacity building.

4.6 Harvesting

Over the course of this study I had the opportunity to harvest the root vegetables on a number of occasions from a few different locations. Digging approximately 250 ml of silverweed at the Atleo River took about one hour. When I dug the same quantity of roots from a beach on the Esowista Peninsula at the same time of year, it took almost half the time to gather the same quantity. Because the patch of roots on the Esowista Peninsula was entirely silverweed and clover, you could simply flip over a clump of the soil and pick out the roots. This made the harvest easier and more efficient.

In contrast, because there were many other plants in the plots at the Atleo estuary, the digging was much more labour intensive. And, when harvesting roots from the Atleo, I was more cautious and spent more time sorting through the roots to ensure I was picking the right ones. In the past, women would have been much more skilled at gathering the roots than we were. Not only would they have had more experience and as a result be more familiar with identifying the roots, but in places where the gardens were actively managed and weeded, harvesting would likely have been more efficient. When I

asked Trudy Frank (pers. comm. 2006) if people ever explained protocols relating to harvesting wild plants, she mentioned:

...yeah, they told us... there's some, even some berries that you can't eat, there's one berry that really has a lot of smell to it, it's called hushbum, and they could eat that, but there's another berry similar to it and they used to say...only the birds eat it, because it's poisonous, but they knew the difference, and they used to tell us like if we're picking roots it should be... by the river where there's a constant flow of water going... medicinal roots too, [you get them from] where there's a flow of water going through...like the alder root, some people use it, it's a medicinal thing and they used to say, you pick it by the river where there is a constant flow... and, if there's alder trees growing where you get drinking water it's good... yeah we used to look out for alder trees... if we wanted a drink from that river.

One day towards the end of the summer in 2006, while we were waiting for the boat to pick us up at the Atleo River, we noticed that we were sitting right beside a large patch of riceroor. We had waited in that same spot on numerous occasions, but for some reason had never noticed these flowers. When we told Dave Frank about this, he talked to us about the concept of *Hishuk ish ts'awalk*. He explained that 'you saw them, when you were ready to,' when we had become more connected, aware and accepting of our surroundings. He explained how this deeper connection to the plants could help a harvester to choose which ones to pick or not to pick.

...what you said, you walk through, walk through [and see] nothing, and then you begin to accept it and wow it's here! The plants call you... this is how we work sometimes, and this is what happened when they walked through the forest to look for something, food to eat... it's almost like neon lights, you know Supervalu, I'm right here, pick me, pick me... it's like that, when you begin to have that connectedness... becoming one, these things pop up...

(Dave Frank pers. comm. 2007)

Dave's words definitely made us think about how appreciative of the riceroor we were when we encountered it towards the end of the season.

4.7 Tasting

We sampled the root vegetables on a number of occasions. In May 2006, my friends Gisele Martin, from the Tla-o-qui-aht First Nation and Severn Cullis-Suzuki, a fellow graduate student at UVic, harvested a bundle of silverweed roots from an estuary

on the Esowista Peninsula. To prepare the roots we steamed them in a pot on the stove for approximately 15 minutes. Although the roots all looked similar in appearance, some had a slightly sweet flavour while others were quite bitter. The differences in taste may have been related to the age of the roots or the condition of the locations where we harvested them. For example, it has been noted that the timing of harvest for individual plants is significant relative to the storage of sugars in the root and that larger roots grown in cultivated settings may also have had greater proportion of sugars (Deur pers. comm. 2008). Most reports also associate better results with long-term steaming (Deur pers. comm. 2008). It would be interesting to undertake a more in-depth study that examines what elements affect the flavour of the roots.

In November 2006, I harvested a silverweed root from a plant that I had grown in a pot at home in Tofino. The root was significantly larger than the roots that I had harvested in the spring and was also lighter in colour. In fact, I couldn't help noticing that, apart from the smaller size, it quite closely resembled the parsnips that were in the grocery store that day. Before cooking the silverweed, I followed traditional management practices and replanted a portion of the root allowing it to re-grow the following year. Again, I steamed the root for 15 minutes on the stove. It was quite tender, not at all woody, and the flavour was definitely reminiscent of a sweet potato.

In May 2007, the summer students and I harvested samples of all three of the root vegetables from the Atleo River estuary for people to taste at a steam pit hosted by the grade fours at Ahousat. Unfortunately, in the flurry of activity surrounding the preparation of the steam pit, the pit was covered over before we had a chance to add in the root vegetables (To provide enough food to feed the group we cooked a selection of commercial root vegetables including potatoes, carrots, beets, garlic, onions and others). In the end, we cooked the harvested root vegetables on the stove and provided samples for people to try. The children really liked the clover rhizomes, which they said tasted like bean sprouts. Not unlike a sweet potato, the silverweed roots were also quite tasty, though some of the roots had a slightly bitter aftertaste. The rice root bulbs were also a little bitter and had a slightly chalky texture similar to a raw potato. However, because it is generally recognized that many underground parts require prolonged boiling or steaming before they could be eaten, the bitterness may have been alleviated by cooking

the roots longer (Turner 1995). The best-tasting bulbs are said to come from coastal areas where the plants are occasionally covered with salt water (Chevallier 1996; Turner 1995; Turner 2004).



Figure 4.22: Silverweed roots harvested spring 2007



Figure 4.23 (left): Dion holding a riceroor plant and bulb that he harvested from the Atleo River Estuary (we removed a portion of the bulb to sample and replanted the remainder)

Figure 4.24 (right): Springbank clover rhizomes

4.8 *Wildlife*

In addition to learning about the plants at the Atleo River, we enjoyed observing the animals that we encountered and considered their connections with the root vegetables. For example the salmon carcasses that we observed in the plots in the fall, likely provided nutrients to the root plants during decomposition.

We also saw many birds feeding and resting in the estuary including bald eagles, trumpeter swans, a great blue heron and a variety of ducks, geese, shorebirds, and hummingbirds. The ducks and geese were especially interesting because there is “...considerable ethnographic and folkloric evidence that suggests that the peoples of the Northwest Coast recognized a close general association between waterfowl and rhizome gardens, and geese and ducks are sometimes depicted as the estuarine gardeners of the time before the transformer’s arrival” (Deur 2005:307). Some groups, including the Ditidaht Nuu-chah-nulth and the Nuxalk at Bella Coola, constructed waterfowl traps around tidal flats and in cases adjacent to their gardens (Turner et al. 1983; Edwards 1979). Hunting the waterfowl in the vicinity of these root gardens served not only to protect the root vegetables from predation by the birds, but also provided an additional food supply for the communities (Deur 2005:307).

Although we didn’t hear any stories of associations between black bears and the root vegetables, I have seen grizzly bears eating rice root bulbs in estuaries on the central coast. At the Atleo River, we frequently encountered black bears turning over rocks and feeding on crabs and shellfish in the estuary at low tide and often came across their scat amongst the plants. We also encountered river otters and harbour seals swimming in and around the mouth of the river, and these animals must surely have influenced the plants of the area.



Figure 4.25 (left): Salmon carcasses on a bed of silverweed, Central Coast
 Figure 4.26 (right): Black bear feeding at the mouth of the Atleo River

4.9 Summary

Hawilth Umeek mentioned that, in general, the current generation of Ahousaht people have much less direct experience with their traditional territories than their ancestors. The major goal of the field trips to the Atleo River was to address this concern and to provide Ahousaht youth with opportunities to get to know and spend time in their traditional territories. Community members felt that it was important for them to learn through first hand experience, the knowledge and skill that was required to maintain and enhance the productivity of these important traditional plant foods and to use them sustainably. The field studies provided a unique forum to engage and train local youth to develop research-based knowledge that is culturally relevant.

Based on our preliminary observations, the three plots, which we studied, appeared on average to have increased in productivity as a result of applying traditional methods of tending and harvesting. Nevertheless, we are aware that there is likely a complexity of influences that ultimately determine the productivity of these root

vegetables. This preliminary study provides but a small insight into the story, compared to many generations of careful observation and practice. This study provided some information about one small area over a relatively short period of time.

However, both the students and I agreed that even this relatively brief introduction to traditional gardening was humbling. It was one thing to read about the traditional management techniques or hear about them from elders, but it was another matter altogether to try these techniques for ourselves and to realize just how much knowledge and hard work went into managing and harvesting the roots. Over the course of the project we frequently discussed how our respect for the students' elders and ancestors continued to grow. In retrospect, I feel that one of the most important outcomes of this experience was facilitating the opportunity to respect and honour these important food traditions.

In this study we also found that traditional Ahousaht knowledge and western science have provided complementary perspectives and observations about the response of the root vegetables to tending and harvesting (garden production). This information could be useful for Nuu-chah-nulth Peoples who are interested in harvesting this traditional food resource, for future ecocultural restoration projects and to help us to understand more about these important estuarine plants.

Chapter 5 - Conclusions

5.1 Introduction

“Your culture is right here, right where it has always been,
and it is speaking to you”

(Roman Frank pers. comm. 2007)

The Nuu-chah-nulth and other First Nations of coastal British Columbia used to maintain gardens of indigenous plants with edible roots on their estuarine tidal flats. These roots are tasty and nutritious, and the plants were carefully tended and nurtured to make them as productive as possible. More recently, the Nuu-chah-nulth diet has changed considerably and these roots are not as well known by Nuu-chah-nulth community members (Trudy Frank pers. comm. 2006; Richard Atleo pers. comm. 2006). This community-based action research project was suggested by members of the Nuu-chah-nulth communities of Clayoquot Sound, as a way of maintaining and strengthening traditional knowledge, cultural identity and ultimately, community health and well-being through developing a demonstration garden of traditional root vegetables and reinstating some of the tending of estuarine root gardens and preparation and serving of the roots in community venues.

As such, the project has involved a diverse range of activities aimed at revitalizing the knowledge, skills and cultural practices involved in caring for traditional root gardens. These activities have included: hosting community steam-pit cooking events; learning from knowledgeable community members; re-creating a root garden in the community of Ahousat; and tending to and observing the result of traditional management techniques on a root garden plot at the Atleo River estuary. Through these activities, the project has provided an opportunity to strengthen and facilitate the connection of Ahousaht youth to their land and culture through experiential learning.

In this final chapter I summarize feedback and reflections on the project from the Ahousaht community, and discuss the role of the root garden project and of the revitalization of traditional knowledge and practices, locally, globally and in the future. In addition, I bring together thoughts and ideas from local community members and

others who recognize and hope to revitalize the inextricable relationships between cultural and ecological health and diversity. In closing, I offer a summary of my conclusions together with recommendations for future research and restoration projects.

5.2 Traditional ecological knowledge and wisdom, today

Many different stages were involved in the development of the *λ'aaya Sas* Project. And in turn, a number of different types of learning were facilitated. Figure 5.1 provides a visual representation of some of the many components of traditional ecological knowledge and practices and how they have been perpetuated in the past.

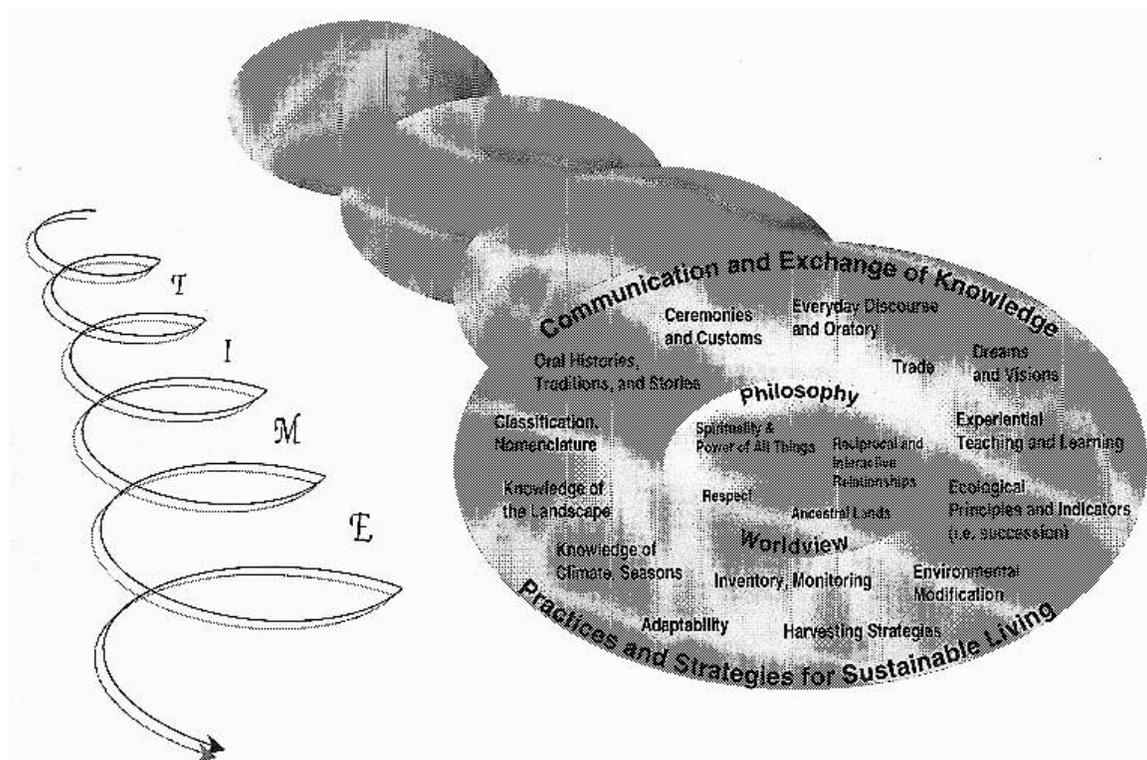


Figure 5.1: Components of Traditional Ecological Knowledge and Wisdom of First Nations of Northwestern North America from M.B. Ignace, R. Ignace and N.J. Turner. (From Turner et al. 2000)

Fikret Berkes, in his book *Sacred Ecology* (1999:8), about traditional land and resource management systems, provides the following definition of Traditional

Ecological Knowledge: “A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.”

In the following section I will include a brief summary of the key stages of the *λ'aayaʕas* Project and identify which concepts from the above diagram (Figure 5.1) were touched on. In consultation with Ahousaht elders, leaders, teachers, community members and my graduate committee, the following activities were undertaken from spring 2006 to fall 2007 in order to provide enhanced opportunities for students to continue learning the important traditional knowledge and skills of their own home territory, culture and language.

5.2.1 Connecting with community members

Throughout the duration of the project the Ahousaht researchers and I had a number of opportunities to learn from knowledgeable community members, through formal interviews, informal conversations and community events, such as the steam pit cooks. This type of learning was very much in harmony with traditional systems of communication and ways of exchanging knowledge. In addition to specific information about the traditional root vegetables and their cultural importance, people explained to us the philosophies and worldviews of caring and respect that are deeply embodied in this traditional food system.

5.2.2 Planting roots

Although the garden that we planted in Ahousaht was not necessarily traditional in that it was not located at an original garden site and the roots species were planted instead of cared for *in situ*, it provided a valuable and accessible opportunity for students and community members to learn about traditional root foods through hands-on experience. In a way, it seems fitting that the project has been adapted to fit in a modern context, because one of the undeniable strengths of traditional ecological knowledge is that it is not static, and instead has the ability to adapt and change when needed.

5.2.3 *Revitalizing knowledge and practice*

Tending to and observing the results of traditional management techniques on a root garden plot at the Atleo River estuary, allowed us to gain a deeper understanding of and respect for traditional practices and strategies for sustainable living. Through this hands-on experiential learning opportunity the Ahousaht research assistants acquired and built on traditional knowledge of their home territory including the landscape, seasons, ecological principles and indicators, environmental modification and harvesting strategies among others.

An important element, and responsibility of the *λ'aayaʕas* Project and of the experiential learning process was to share the things we had been learning about as well as our stories and experiences as well. As described in Chapter Three we did this through a variety of ways, including an educational poster, programs with the school, presentations and slideshows, and probably the simplest and most effective way was through casual conversations in the community.

This project was undertaken with the encouragement and support of the community of Ahousaht and it is their guidance and involvement that has made it successful. It is our hope that our experiences can help to inform and inspire other projects within the community and other communities aiming to perpetuate and support their traditional and local knowledge for the benefit of generations to come.

Following, is a summary of the feedback and suggestions from the community.

5.3 *Reflections - feedback*

The evaluation of the project by myself and Ahousaht community members was an on-going process. I received feedback from the student researchers on a continual basis when we worked together in the summer. I also met with teachers and elders in the community throughout the duration of project to date, to gather ideas and suggestions. Some of the staff from the school also provided me with written feedback about their students' and their own experiences with the *λ'aayaʕas* Project and their suggestions for future projects as well. In addition I kept a journal of my experiences and observations throughout all stages of the project.

The following three themes emerged from my reflections and based on the feedback: overall experiences, ideas, suggestions, and future directions for the project and the role/importance of the roots. The section on the role of the roots is interspersed with information gathered from other resources as well, because I found that many of the comments from the community logically fit with ideas from other local communities as well as globally.

5.3.1 Overall experience of the *λ'aayaʒas* Project:

At the end of the summer season, the Ahousaht student researchers filled out anonymous comment forms with their feedback about the project. The comments from the students were all very positive. When asked about the project one of the students responded, *“I liked the way we did the garden, the way we built it. And when we went to the Atleo River every week. I like everything basically.”* Another student commented, *“Everything was really good. I really liked learning about plants.”* Yet another student wrote, *“It was pretty fun and cool and a good project and I would like to do it again.”* I didn't receive any negative feedback from the students. However it should be taken into consideration that although I was careful to explain that all types of feedback are helpful, the students may not have felt comfortable sharing any negative thoughts they may have had, for fear of hurting my feelings.

One student explained that they thought the *λ'aayaʒas* project provided a good way to learn about root gardens because, *“[when you learn about them]...then you could tell someone and that person could tell others.”* One of the students told us a story about how her older sister and friends were joking and saying that ever since she worked on the *λ'aayaʒas* Project, whenever they go on a walk with her now *“the walks are all educational,”* because she is constantly naming the different plants and talking about their uses. I think that she was quite proud of the knowledge she had gained because the knowledge and skills she had learned were tangible and relevant to where she lives.

In addition to the direct comments we received, indirect feedback was also a valuable indicator of the interest in the project. For example, the students often called me to check in and see when our next trip to the Atleo River would be. Also, as the project continued, more youth expressed an interest in being involved, because they had heard

about it from their friends. A few of the students told me that they thought it was “really neat” that it was work – since they enjoyed it so much. Other students and children in the community often came along to help out; even though they weren’t officially ‘working,’ they were keen just to participate.

5.3.2 Community members’ feedback

Dave Frank from the Ahousaht Holistic Centre commented about the future benefits of the *λ’aayaʔas* Project:

I see this as a lesson here. Our children that took part in it, it’s probably in there now, they’re going to hold on to it and then maybe share it somewhere down the road or make use of it somewhere down the road.

He also commented,

...[the garden] is a great idea, because it sparks an interest in people...even that spark of interest that’s huge, that’s not a little thing, that’s a huge thing, people walk by and wonder what is this? And you may not be there and one of the staff gets to explain what it is and they go ‘wow!’ They look at it, that’s huge... it looks like small project itself; physically it’s a small project, but overall it’s a big thing for the community, to be able to come and say, ‘well that’s us!’

(Dave Frank pers. comm. 2007)

Teachers from Maaqtusiis School also provided positive feedback and wrote that, “*the inclusion of steam pit cooking was a great experience for the children,*” and “*our class benefited both from the garden and Jen’s warm hearted approach...*” Another teacher expressed that “*it is a good project, both for student/youth work and knowledge and community input.*”

Looking ahead

5.3.3 Suggestions and improvements

Once the garden in Ahousat had been completed and our first field season was completed (September 2006), I asked elders, students, teachers and staff from Maaqtusiis

School and other community members if they had any suggestions for how we could improve the *λ'aayaʁas* project, and also if they had ideas for projects they would like to see happen in the future. Most of the responses mentioned expanding or building on the idea of the root garden, and a few people discussed additional ideas for learning about traditional plant foods.

When asked about the project and the idea of learning about traditional plant foods, Trudy Frank suggested, *"I would keep encouraging them to ask questions... and take them out to show them [the plants]..."* Dave Frank advised that to improve on the project we could *"... advertise it a little more so that some of the elders could take a look and say 'well I recognize that,' and they might say 'well, maybe next year they can put this in there..."* I agree with this suggestion, that it would be an excellent idea to have more people involved, especially elders. As a visitor in the community, I acknowledge that it took quite a while for me to make connections and to find respectful and meaningful ways of engaging people in the project. I suspect that future projects would come together more readily, with the root garden experience as the foundation.

The students also had ideas for building on the root garden project. One student suggested that we could *"...maybe go to more places to learn more plants,"* and that we should *"...start a new garden around Ahousat and plant them [the root veggies]."* Teachers and staff from Maaqtusiis school commented that we could *"...continue this project with even more help from community members,"* and that we might want to *"...plant [a root garden] outside an elder's home."* One staff member also recommended that, *"luncheons with elders/you and all interested agencies would be a great scenario to receive information."*

When asked if there were other things that they would like to learn about, a student responded, *"I would like to learn more about traditional plants, root gardens and whatnot, probably through a presentation, book or going on a walk and someone showing me."* A staff member from the school suggested that *"...learning about and doing preserves, can/jar veggies/fruit"* would also be a great activity to do with youth in the future.

Summary of feedback

Overall, the *λ'aayaʒas* Project was very well received by the community of Ahousaht and other local communities as well. Students, teachers, elders and other community members gave positive feedback and also provided some good ideas for future endeavors. In general, the main recommendations included ideas and suggestions for expanding on the project. These included: youth learning from their Elders; youth having the opportunity to spend time in their traditional territory; creating opportunities for community members of all ages to learn more about traditional foods; students gaining research skills that are culturally relevant; and also students having opportunities to recognize the value of Ahousaht local knowledge. As mentioned earlier, we also identified a number of challenges and ideas for the future.

5.4 Why roots? “part of the healing”

It is unlikely that the root vegetables or other native plant foods will regain the importance in the diet and economy of British Columbia First Nations that they had in the past. Among other things, the convenience and efficiency of commercial foods is hard to compete with. However, increasingly people such as Richard Atleo and other elders and community members are recognizing that there are benefits to revitalizing the knowledge and use of these roots and other plant foods to some extent (Turner and Kuhnlein 1982; Turner and Turner 2007). Revitalizing these food traditions through creative community-based education projects can help to restore and strengthen traditional ecological knowledge, encourage better health, and strengthen cultural identity. In addition, this type of outdoor experiential learning can reconnect people to the world around them and can provide a model of respectful and sustainable relationships with our environment.

Over the course of the project, a number of people commented that they enjoyed seeing the traditional foods growing there when they walked by the garden. Dave Frank talked about the role of the root garden at the Holistic Centre:

People who come here are often coming for help, they don't know who they are, of where they are, and the ceremonies we do help give you a sense of who you are and where you're from, but so does the garden, seeing traditional foods, it's part of something bigger. It might just look like a garden but it has an impact,

physically, emotionally, mentally and spiritually, it's part of the healing, you see the traditional foods and you know who you are and where you are...it has a real impact on the community.

In his book, the *Ahousaht Wild Side Heritage Trail*, Ahousaht elder Stanley Sam, discusses the importance of culturally modified trees and landscapes (such as root gardens) and explains that,

...our forest and mountain sides tell us the histories of our ancestors. If you destroy these modified trees, these histories will be destroyed. It's as if we went into a library and ripped up the one and only existing copy of a history book.
(Sam 1997:92).

Dave Frank also talked about how the root garden reminds people of the importance of traditional foods and of all the knowledgeable people in their community that they can learn from. He explained,

it's a really interesting concept because it's a garden...and in the early days... people had ownership to some of these things even though it was out in the wild, they worked at it, they did some work to enhance it, and a lot of that is gone now, but it's good to have an awareness that it's still there, you can do a lot of things with it. Those traditional foods, kept us healthy...and they taste alright, they taste good... so it's just a matter of going out and getting them, doing something like this [λ'aayaʕas] it makes us aware that they're out there and it makes people aware that yeah we can go and get it ourselves... we're used to the fish and t'ucup, and all those other things coming in, we know that, we know when it will be coming in and something like this [the root vegetables] it was equally important for our people and to bring it back like this and to make them aware, yeah it's like fish and t'ucup you can go out and get it, you go harvest it, bring it in and eat it...and it's good! Traditional food...it gives us a healthier, more balanced diet... So I see it as good in that sense, it brings that awareness, also it brings awareness that people [in the community] know, you just need to go out and ask [them].

(Dave Frank pers. comm. 2007)

When we spoke with Roman Frank in Ahousat about culture and change, he shared the following story with us, which was told to him by a good friend.

A man was attending a North American Indigenous Conference in the Mid-eastern U.S, and was very lucky to befriend an elder during his visit. After getting

to know the elder, he found himself one day lamenting at great length about how the culture in his community was dying or even dead! "No one sings the songs anymore, no one speaks the mother tongue anymore, no one even acts the same anymore... Everyone just wants to look out for themselves!" On and on he went, and about 1/2 hour later or more, he finally composed himself, and apologized to the elder for rambling on for so long... It was just that, whenever he thought of all the culture which had been lost, it angered and frustrated him very deeply... The elder meanwhile, simply nodded his head and listened intently; eyes closed and a slight grin on his lips... As this young man finished apologizing, the elder opened his eyes and looked directly at him...

"Are you done!?" he asked...

"Ahh, yeah, I guess I am" he said apologetically...

"Well I am going to tell you one thing and one thing only. Your Culture is not dead. When the wind blows through the trees, when the ocean crashes onto the shores of your homeland, when the water flows and whispers over the stones of the brook-bed; when the newborn baby cries into the air... Your culture is right there, right where it has always been, and it is speaking to you... You just forgot how to listen..."

(Roman Frank pers. comm. March 2007)

Indigenous Peoples and long-term residents around the world have developed many conservation strategies to maintain biological populations and productivity of plant and animal food resources. "Selective and seasonal harvesting, habitat conservation and maintenance, and use of diverse resource bases are practices which were widely used, and are as applicable to modern resource use as they were in the past" (Kuhnlein and Turner 1991:21). Many of these important conservation messages are embedded in traditional stories. Dave Frank shared one of these stories with me.

...there's so many lessons in our stories that we hear about things like that. I'm thinking about that story... this lady and her family were really in need of food and they had nothing, and they were hungry for a long time now, and she had a vision or dream that night and she was told "you're going to get a fish, and what you're going to do with that fish is you're going to offer it back to the sea, a gift back, and then you'll get abundance in return," so she agonized over that when she got the fish, she really agonized over it because her kids were, you know how kids can be when they're hungry, they want to eat, but she trusted what was given to her, she trusted, and that's where that acceptance comes in, she accepted it and said... "o.k. I will, give it back," and low and behold the next morning you could hear the sounds on the beach... it's happening, it's happening... millions of fish [on the beach], but she never ever forgot that lesson you know, you take only what you need, and you give back also, so there's that lesson of putting back, so

she got what she needed from all the fish and she gave back again, so that's those little stories we hear, some of them...

Hearing many of these stories that have been told for generations made me think about the strong connection that the Nuu-chah-nulth Peoples have to this place and the importance that people placed on making long-term decisions. For example, Gisele Martin from the Tla-o-qui-aht First Nation told us about an important teaching that prohibits people from hunting pregnant animals. She explained that if someone disobeyed this law, it was considered “*stealing from the next generation*” and the hunter would be severely punished.

Dave Frank also told a story that also exemplifies this strong sense of rootedness to the land:

...You know a lot of these things were tested over time, I guess... trial and error... even that ice age, there's stories about the ice age, two brothers that fed this whole area, Ahousat, Meares Island, Vargas Island all those little communities there, they were frozen up, and the two brothers went out and they came in with seals and they fed the whole community... kept them fed during the ice age, and they never ever left the land...they were one with it, became one with it, you're Quus, you're rooted into the land here, you're there, so you're one with it, so they never ever left it when the ice age came, they stayed, they survived...

I noticed a considerable contrast between the long-term stewardship messages in these stories and the way many people around the world live and make decisions today. In many cases, if people don't like something they simply move on. If they deplete the resources, or pollute the environment they move on. I couldn't help but wonder how different our actions, as a society, might be if we knew we were here to stay for the long-term and that our great grandchildren will be affected by our actions. This is obviously something to consider with our earth in general, but I think that because it is on such a large scale the idea is less tangible and harder to grasp. We continue to make decisions that may compromise future generations, often with the assumption that there will always be that ‘next place’ and that if we run out of places, technology will provide us with answers. I am not suggesting that we should never move, or ‘move on.’ Things have changed, and many people, including Nuu-chah-nulth, and other Indigenous peoples leave their communities and traditional territories and move elsewhere. But it does seem

that considering the long-term results of our actions, wherever we are, is equally important and that this is why many of these traditional messages are as critical today as they have ever been.

Increasingly, people from around the world are appreciating the value of recognizing and revitalizing the inextricable relationships between cultural and ecological health and diversity. In 1999, the United Nations Environment Programme compiled a publication entitled *Cultural and Spiritual Values of Biodiversity* (REF). The document included important messages about the links between cultural and spiritual health and suggested that a critical task is to rekindle and enhance the spiritual and cultural values that peoples have used effectively to conserve biodiversity. Turner and Jones (2000:22) expand on this idea and suggest that “If we can find a way to return to these models [of sustainable resource use] and the personal, focused, long-term stewardship practices they represent, we just might be here to mark the next millennium.” In addition, this must be done in respectful and mutually beneficial ways, which are guided and initiated by the diverse groups and holders of this knowledge.

The Nuu-chah-nulth root gardens provide one example of a long-term stewardship and conservation practice, embedded in a traditional food system that has fallen out of use. Turner and Turner (in press) explain that because there is a whole suite of complex and compounding factors that have resulted in the decreased use of and dwindling cultural knowledge about these traditional plants foods, the revitalization of the associated knowledge and practices cannot be re-established with one simple fix. “Rather, it requires a spectrum of diverse, ongoing initiatives with compounding, positive effects that will eventually turn the tide towards reclaiming this important aspect of peoples’ health and cultural heritage” (Turner and Turner in press).

There is still much work to be done, but there are also many examples of inspiring projects initiated by local communities to find “relevant and effective ways to revitalize languages, cultures and ethnobotanical knowledge within contemporary contexts” (Turner and Turner in press). And, there are many people living the example. The root garden project is just one small piece of a much larger puzzle.

Hopefully we humans, despite our different roots, can continue to work together to find mutually beneficial and respectful ways to live well with all life on this earth, and do so in a way that ensures the health and well-being of generations to come.

As Dawn Morrison from the Secwepemc First Nation explained in the Final Report of the 1st Annual Interior of B.C. Indigenous Food Sovereignty Conference that

While it may be unrealistic to think that people of different cultures will adopt all of our cultural values, we believe that it is necessary that the cultural values of giving, sharing and avoiding over-consumption can be integrated into the lifestyles of all peoples. We believe that the different races were created and brought together to test how we deal with our actions and enact our teachings around sharing and taking care of the land and one another in the current ecological and cultural crises we are faced with (Morrison 2006:8).

I hope that raising awareness and appreciation of the respectful relationships with the natural environment reflected by the root gardens and their use can help provide a model for local stewardship and conservation and in turn will support vibrant communities, a healthy environment and a more sustainable society.

“We must resolve to weave the life sustaining customs of all diverse groups on earth into a resilient fabric that will protect the sanctity of all life”

(Klaus Topfer In: Posey 1999:xii).

5.5 Conclusions and Recommendations

This community-based ecocultural restoration project has encompassed a variety of activities aimed at revitalizing the knowledge, skills and cultural practices involved in caring for traditional Nuu-chah-nulth root gardens. Because we chose to follow a community action research approach, I served mainly as a facilitator of the process, listening to and encouraging ideas, but allowing the community to take the lead and decide what they would like to do and how. Ongoing ideas and suggestions have helped to shape both my approach and the activities we chose to undertake. This thesis has documented the development of this project, and, with the hope of providing other

communities with useful feedback and ideas, has assessed the question of whether a community-based ecocultural restoration project, can provide an effective and meaningful way to revitalize and renew awareness of a traditional food practice for nutritional and cultural benefit in a Nuu-chah-nulth community. Overall, the *λ'aayaʒas* root garden in Ahousat has provided a unique opportunity and venue for teaching about Nuu-chah-nulth food, culture and environments. Through the process of creating a Nuu-chah-nulth root garden patterned on traditional practices of tending and producing roots for food in estuarine gardens, community members of all ages have been engaged in learning about, sharing and renewing an important body of Ahousaht botanical knowledge and practice. Although the roots that we planted and tended to have not directly provided a measurable nutritional benefit, working on the garden and hosting community steam pit cooking has inspired many discussions about traditional diets and healthy eating in a modern context. And, if there is interest, the root vegetables from the garden could be harvested and served along with other traditional foods for special events in the community. Although the establishment of the garden did provide a situated end result, as is the case with many action research projects, the process was as important as the final product. Feedback from the community has been positive and there are many ideas to build on and expand on the garden project and to continue to incorporate it into educational programs and cultural events.

As part of the *λ'aayaʒas* Project we also conducted a preliminary field experiment at the Atleo River estuary. Through our fieldwork we investigated and observed the effects of traditional management practices on the productivity of estuarine root vegetables. Based on our preliminary observations, the three plots, which we studied, appeared on average to have increased in productivity as a result of applying traditional methods of tending and harvesting. These results were for the most part in accordance with oral evidence and other previously recorded observations, and illustrate that traditional Ahousaht knowledge and western science provide complementary perspectives and observations about the response of the root vegetables to tending and harvesting (garden production) (Deur 2000; Trudy Frank pers. comm. 2006).

However, it is important to consider that the traditional Ahousaht knowledge of these ecosystems is rooted in generations of careful observation and practice. In contrast,

this study was conducted over a relatively short period of time and focused specifically on the impact of weeding on the garden plots. There is likely a complexity of influences that ultimately determine the productivity of these root vegetables. In addition, there were many other traditional management techniques that likely affected the productivity and quality of the root vegetables and gardens (Deur 2000), but which we did not have the opportunity to test. Studying the effects of fertilizing, routine tilling of the soil and the selective harvesting and replanting of the roots, for example, would likely provide interesting insight into these practices, but would also require a more focused, more lengthy and more in-depth analyses to study adequately. Nevertheless, the *λ'aayaʒas* Project offered us a hands-on opportunity to learn about traditional Nuu-chah-nulth root gardens and as such provides a unique case study for raising awareness about and revitalizing important cultural traditions and food production systems. It is our hope that, providing direction for community-based research projects and the development of methodology are some of the key benefits this field study can offer to future endeavors.

In retrospect, I feel that the *λ'aayaʒas* Project has been a very positive experience, and has definitely raised awareness of the knowledge and use of traditional root vegetables. However, as mentioned previously, just as an accumulation of factors have led to the decline of the knowledge and use of Nuu-chah-nulth root vegetables, it will similarly require a diverse range of efforts to maintain and revitalize the knowledge of these traditional food systems. It is not likely that the root vegetables will regain the staple role in the diet that they held in the past. Changing life ways and the availability and convenience of modern foods are hard to compete with. Yet, it is increasingly being recognized that the overarching themes of eating locally, maintaining traditional and local knowledge and community health and well-being, and strengthening and nurturing our connections with the world around us are just as important today as they were in the past.

There are currently a number of exciting initiatives underway in Ahousaht and in other Nuu-chah-nulth communities that address these issues. Furthermore, there are also many ideas for projects that people would like to see happen in the future. Some of these are included in the following recommendations.

5.5.1 Facilitating and respecting traditional plant use - Directions for future ecocultural restoration and research

- **Future ecocultural restoration and research initiatives should be guided and led by local First Nations communities at all stages.** From my experience, community-based participatory action research has provided a valuable framework in which to engage researchers and community members in respectful and meaningful ways.

The following recommendations have emerged through ongoing discussions with community members in Ahousat.

- **Conduct similar ecocultural restoration projects with other local Ahousaht foods**

The *λ'aayaʒas* Project was focused on Nuu-chah-nulth root vegetables. There are many other plant and animal species that were of great importance to the diet in the past, but that are no longer as well known today. Future projects could follow a similar experiential learning approach and involve learning about, harvesting, preparing and consuming other traditional foods as well.

- **Create more opportunities for youth to connect with and learn from elders.**

Family ties in Ahousaht are strong. Yet because of the modern school system, children and youth don't have the same opportunities to learn from and spend time with their elders. The school in Ahousaht has initiated some exciting projects in which students interview and learn from knowledgeable community members, and people are interested in expanding and building on this idea.

- **Further document and share local ecological and cultural knowledge of traditional plant foods.**

During the course of this research project we had the chance to speak with a couple of Ahousaht elders, but there are many more knowledgeable people in the community and other communities as well who have extensive knowledge about and experience with traditional foods and resource management strategies. And, there are also many other topics that could be explored. Students could be engaged in the process

through a number of ways. For example, students could film the discussions and make a film about local knowledge or a specific subject.

- **Generate opportunities for youth and community members of all ages to spend time getting to know their traditional territory.** The Ahousaht student researchers who helped with this project identified the trips to the Atleo River Estuary as one of the highlights of their experience. Some families travel throughout Clayoquot Sound to harvest food, visit or attend retreats, but others do not. Yet there is definitely an interest. For example, Gisele Martin from the Tla-o-qui-aht First Nation has started a program called *Nisma* (Nuu-chah-nulth for land), in which she takes local youth from the Tla-o-qui-aht communities of Opitsaht and Esowista on day trips to explore and get to know their traditional territories. The trips are really well received by the kids and their families. An interest has been expressed in building on expanding this program.

- **Develop meaningful ways to include Ahousaht ecological and cultural knowledge into the school system.** Maaqtusiis School has successfully incorporated local knowledge and culture into the educational experience at the school in many ways, and the teachers and staff are always looking for new ideas and programs. The garden could provide a wonderful focus for student research projects ranging from Biology to Social Studies.

- **Establish a program to remove invasive species.**

Invasive species such as scotch broom (*Cytisus scoparius*) have spread rapidly in Ahousat and are out-competing many native species of cultural importance. A number of elders also voiced concerns over invasive plants. For example they attributed ‘scratchy sore throats’ and other allergic symptoms to the broom, and suggested that these reactions were because the broom “was foreign to their bodies”. An invasive species removal program could create an interesting experiential learning program for a high school biology class to learn about both native and introduced plant species.

• **Undertake further studies to learn about traditional harvesting and management techniques.** Learning about the management of Nuu-chah-nulth root gardens, taught us much about local ecosystems as well as philosophies and worldviews. Future research could examine the role of traditional harvesting and management techniques in contemporary restoration and resource management. And, more in-depth field experiments could provide interesting insight into these practices.

As well, there is a significant amount of literature about traditional Nuu-chah-nulth foods that is not available in local communities. Future projects could incorporate gathering this Nuu-chah-nulth information and working with the community to make it more accessible to those who it is most relevant, for example through slide shows, posters, films, books etc. For example the Nuu-chah-nulth fisheries program – Uu-a-thluk, is currently compiling a cookbook of both traditional and modern recipes for local Nuu-chah-nulth foods.

• **Traditional activities (such as root digging, berry picking, and collecting materials for weaving) which in the past have helped to shape the forest ecosystems of Ahousaht traditional territory could be reintroduced in areas such as the Atleo River Valley.**

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Appendices

Appendix A HREB Certificate of Approval

 University of Victoria	Human Research Ethics Board Office of Research Services University of Victoria Room A240 University Centre Tel (250) 472-4545 Fax (250) 721-8980 Email ovprhe@uvic.ca Web www.research.uvic.ca													
	Human Research Ethics Board Certificate of Approval													
<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;"><u>Principal Investigator</u></td> <td style="width: 33%;"><u>Department/School</u></td> <td style="width: 33%;"><u>Supervisor</u></td> </tr> <tr> <td>Jennifer Pukonen Graduate Student</td> <td>ENVI</td> <td>Dr. Nancy J. Turner</td> </tr> <tr> <td colspan="3"><u>Co-Investigator(s):</u></td> </tr> <tr> <td colspan="3">Dr. Nancy Turner, Co-investigator, UVic Dr. Richard Atleo, Co-investigator, UVic</td> </tr> </table>			<u>Principal Investigator</u>	<u>Department/School</u>	<u>Supervisor</u>	Jennifer Pukonen Graduate Student	ENVI	Dr. Nancy J. Turner	<u>Co-Investigator(s):</u>			Dr. Nancy Turner, Co-investigator, UVic Dr. Richard Atleo, Co-investigator, UVic		
<u>Principal Investigator</u>	<u>Department/School</u>	<u>Supervisor</u>												
Jennifer Pukonen Graduate Student	ENVI	Dr. Nancy J. Turner												
<u>Co-Investigator(s):</u>														
Dr. Nancy Turner, Co-investigator, UVic Dr. Richard Atleo, Co-investigator, UVic														
<u>Project Title:</u> Nuu-chah-nulth Ti'aaya-as Research Project														
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06-118	08-May-06	08-May-06	07-May-09											
Certification														
<p>This certifies that the UVic Human Research Ethics Board has examined this research protocol and concludes that, in all respects, the proposed research meets appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Subjects.</p>														
 _____ Dr. Richard Keeler Associate Vice-President, Research														
<p>This Certificate of Approval is valid for the above term provided there is no change in the procedures. Extensions or minor amendments may be granted upon receipt of a "Research Status" form.</p>														
06-118 Pukonen, Jennifer														

Appendix B HREB Letter of informed consent

**School of Environmental Studies
University of Victoria**

Participant Consent Form 1a
[for interviews with elders]

Nuu-chah-nulth λ'aayaŋas Research project

You are being invited to participate in a study entitled the **Nuu-chah-nulth λ'aayaŋas Research Project** that is being conducted by Jen Pukonen.

Jen Pukonen is a graduate student in the School of Environmental Studies at the University of Victoria and you may contact her if you have further questions by phone at 725-2567 (Tofino). The project is being conducted under the supervision of Dr. Nancy Turner and Dr. Richard Atleo (*Umeek*). You may contact Nancy Turner at (250)721-6124 or Richard Atleo at (204)269-3552.

The purpose of this research project is to involve interested community members in Ahousat in the research and re-creation of a traditional Nuu-chah-nulth root garden of *ŋaŋiic'uqmapt* (springbank clover), *tlicy'upmapt* (Pacific silverweed,) and *kuuxwapiihmapt* (northern rice root). This project was suggested by Richard Atleo and Nancy Turner as a way of promoting and maintaining important traditional knowledge about sustainable foods productions systems.

This research project is being funded by the Clayoquot Biosphere Trust (TBD).

You are being asked to participate in this study because you were recommended as someone who knows about and may be interested in root gardens, traditional foods or food production systems. An important element of this project is the collection and synthesis of information about traditional Nuu-chah-nulth root gardens as well as gathering suggestions for the development of the root garden.

If you choose to voluntarily participate in this study, your participation will involve a one to two hour interview with Jen Pukonen in order to document your knowledge or perspectives about traditional root gardens. The information sheet with this letter will provide you with the background about the project and what to expect from the interview. The consent form that I have included with this information sheet is meant to ensure that the information that you provide is protected and is also necessary to comply with the regulations set out by the University of Victoria Human Research Ethics Board (HREB).

If I agree to participate in this study, I understand that:

1. My participation is completely voluntary;
2. Jen Pukonen will offer me an honorarium of \$25.00 per hour to reimburse me for any costs that I incur due to my participation and in appreciation of my participation;
3. It is important for me to know that it is unethical to provide undue compensation or inducements to research participants and, if I agree to be a participant in this study, this

- form of compensation to me must not be coercive. If I would not otherwise choose to participate if the compensation was not offered, then I should decline;
4. With my consent, the interview will be audio recorded, field notes will be taken and if possible, video recordings may be taken as well.
 5. The taped interview will be transcribed and notes typed up;
 6. Any information I provide will be returned to me in written form, and re-checked by myself together with the researcher to make sure the information is accurate and complete;
 7. I will receive copies of any photographs taken of me and, if I wish, or tapes of my interview;
 8. Photos of myself will be used only with my consent;
 9. The research material will be kept secure, in a locked office until the completion of the project.
 10. The ownership and control of the information I provide is mine;
 11. Jen Pukonen will return all original research materials to me _____ upon completion of the project;
 12. Also, once the research material is returned, my family and my band will have complete control over its security and its distribution from that time on;
 13. I will have an opportunity to deny publication or public distribution of any of the information I provide;
 14. I recognize that talking about past resource use may involve talking about subjects that are stressful or painful. However, I understand that Jen does not intend to prompt me to discuss these issues, that I can end the interview at any time or continue the interview at another time and if I do wish to discuss these issues that Jen will listen with compassion and respect.
 15. I may withdraw from the interview at any time without consequence;
 16. I agree that any material recorded to date will be returned to me in full if I decide to withdraw from the interview.
 17. I will be consulted from time to time during the course of the research to make sure that I still wish to continue my participation;
 18. My anonymity may not be protected within Ahousat as other community members may know that I participated in the study. However, if I wish, the information that I contribute for the written report will be kept confidential by omitting names and identifying information;
 19. Benefits to me from my participation in the research include: an opportunity to provide guidance and suggestions for the *λ'aayaʕas* research project and contributing to our understanding of traditional Nuu-chah-nulth root gardens.

Having read the above:

I agree to be identified as a participant of the aforementioned *λ'aayaʕas* project.

OR

I do not agree to be identified as a participant of the aforementioned *λ'aayaʕas* project.

Following review of the research material, the researcher and I will discuss specifically what information I provided will be used in conferences, lectures, publications and presentations.

Signed: _____

Date: _____

In addition to being able to contact the researcher at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250)472-4545.

A copy of this consent will be left with you, and a copy will be taken by Jen Pukonen.

Kleco, Kleco, Thank you

School of Environmental Studies
University of Victoria

Participant Consent Form 1b

Nuu-chah-nulth λ'aayaŋas Research Project

This consent form is intended to be filled out after you have received and reviewed the transcripts and any photographs from your involvement in the project.

I, *Participant name* consent / do not consent (*please check one box*) that information contained in the transcripts and photographs entitled *Interview with _____ on Date, 2006* be used in Jen Pukonen's Master of Science Thesis for the University of Victoria.

I, *Participant name* consent / do not consent (*please check one box*) that information contained in the transcripts and photographs entitled *Interview with Participant name on Date, 2006* be used in educational materials (posters for local schools etc.).

I, *Participant name* consent / do not consent (*please check one box*) that information contained in the transcripts and photographs entitled *Interview with Participant name on Date, 2006* be used in publications and presentations.

I, *Participant name* consent / do not consent (*please check one box*) that copies of the photographs and transcripts of the information collected in the interview with Jen Pukonen on Date, 2006 be submitted to Dr. Nancy J. Turner at the School of Environmental Studies at the University of Victoria.

I, *Participant name* consent / do not consent (*please check one box*) that copies of the photographs and transcripts of the information collected in this interview with Jen Pukonen on Date, 2006 be submitted to the Ahousaht Band Council.

(*Participant name*)

(Date)

(Jen Pukonen)

(Date)

If you have any questions, comments or concerns please feel free to contact me at (250)725-2567 (Tofino). If you have any questions or concerns about this research project that you are uncomfortable discussing with me, please contact my supervisor Nancy Turner at (250)721-6124 or my advisor Richard Atleo (Umeek) at (204)269-3552. In addition to being able to contact the researcher at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250)472-4545.

***A copy of this consent will be left with you, and a copy will be taken by Jen Pukonen.
Kleco, Kleco, Thank you***

School of Environmental Studies
University of Victoria

Participant Consent Form 2a
[for community volunteers]

Nuu-chah-nulth λ'aayaŋas Research project

You are being invited to participate in a study entitled the **Nuu-chah-nulth λ'aayaŋas Research Project** that is being conducted by Jen Pukonen.

Jen Pukonen is a graduate student in the School of Environmental Studies at the University of Victoria and you may contact her if you have further questions by phone at (250)725-2567 (Tofino). The project is being conducted under the supervision of Dr. Nancy Turner and Dr. Richard Atleo (*Umeek*). You may contact Nancy Turner at (250)721-6124 or Richard Atleo at (204)269-3552.

The purpose of this research project is to involve interested community members in Ahousat in the research and recreation of a traditional Nuu-chah-nulth root garden of *ŋaŋiic'uqmapt* (springbank clover), *tlicy'upmapt* (Pacific silverweed,) and *kuuxwapiihmapt* (northern rice root). This project was suggested by Richard Atleo as a way of promoting and maintaining important traditional knowledge about sustainable foods productions systems.

This research is being funded by the Clayoquot Biosphere Trust and EcoAction Canada.

You are being invited to participate in this study because you have expressed an interest in helping to re-create a traditional root garden.

If you choose to voluntarily participate in this study, your participation will vary depending on your interest. You can contribute anywhere between ½ hour and a day and will have the opportunity to prepare the garden site, plants the root vegetables, tend to and monitor the garden and help to harvest the garden in the fall. This information sheet with this letter will provide you with the background about the project and what to expect from participating. The consent form that I have included with this information sheet is meant to ensure that the information that you provide is protected and is also necessary to comply with the regulations set out by the University of Victoria Human Research Ethics Board (HREB).

1. My participation is completely voluntary;
2. With my consent, my comments and suggestions about the project will be recorded by hand;
3. Any information I provide will be returned to me in written form, and re-checked by myself together with the researcher to make sure the information is accurate and complete;
4. With my consent, photographs may be taken of my participation in the project;
5. I will receive copies of any photographs taken of me;
6. Photos will be used for project analysis and/or dissemination only with my consent;

School of Environmental Studies
University of Victoria

Participant Consent Form 2b

Nuu-chah-nulth λ'aayaɣas Research Project

This consent form is intended to be filled out after you have received and reviewed the transcripts of your (or your child's) comments about the project and any photographs of your (or your child's) involvement in the project.

I, *Participant name* consent / do not consent (*please check one box*) that information and photographs contained in the transcripts entitled *Participants name's Participation in the λ'aayaɣas Project on Date, 2006* be used in Jen Pukonen's Master of Science Thesis for the University of Victoria.

I, *Participant name* consent / do not consent (*please check one box*) that information and photographs contained in the transcripts entitled *Participants name's Participation in the λ'aayaɣas Project on Date, 2006* be used in educational materials (posters for schools etc.).

I, *Participant name* consent / do not consent (*please check one box*) that information and photographs contained in the transcripts entitled *Participants name's Participation in the λ'aayaɣas Project on Date, 2006* be used in publications and presentations.

I, *Participant name* consent / do not consent (*please check one box*) that copies of the transcripts and photographs of my participation in the *λ'aayaɣas* project on *Date, 2006* be submitted to Dr. Nancy Turner at the School of Environmental Studies at the University of Victoria.

I, *Participant name* consent / do not consent (*please check one box*) that copies of the transcripts and photographs from my participation in the *λ'aayaɣas* project on *Date, 2006* be submitted to the Ahousaht Band Council.

(*Participant name*)

(Date)

(*Parent or Guardian's Name, if applicable*)

(Date)

(Jen Pukonen)

(Date)

If you have any questions, comments or concerns please feel free to contact me at (250)725-2567 (Tofino). If you have any questions or concerns about this research

project that you are uncomfortable discussing with me, please contact my supervisor Nancy Turner at (250)721-6124 or my advisor Richard Atleo (Umeek) at (204)269-3552.

In addition to being able to contact the researcher at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4545).

A copy of this consent will be left with you, and a copy will be taken by Jen Pukonen.

Kleco, Kleco, Thank you

Appendix C Sample Interview questions

Nuu-chah-nulth λ'aayaʔas Project: Sample Interview Questions

1. Participant name
2. Date of interview
3. Do you know any of these plants? (show pictures of the plants)
4. Are you familiar with traditional root gardens?
5. Can you tell me what you remember about or what you have heard about root gardens?
6. Do you know if there is a Nuu-chah-nulth name for these gardens? The root vegetables?
7. Did you or anyone you know ever go out to tend to or dig root vegetables?
8. Do you remember where the gardens were? Can you point them out on a map?
9. Do you know if people went to the estuaries for any reason other than to dig root vegetables?
10. Who did the harvesting? Were they old, young, men, women?
11. How many people would help?
12. What tools and containers were used to harvest the roots?
13. How many roots were normally harvested?
14. At what time of year were root gardens normally harvested?
15. How would you know that it was the right time to harvest the roots?
16. How were the roots stored and prepared?
17. Have you ever eaten the roots? How did they taste?
18. Do you think there are fewer roots or more roots than there were in the past?
19. When was the last time you saw people going to dig root vegetables?
20. How many people did you see at this time?
21. Why do you think people have stopped tending to and harvesting root gardens?
22. Do you think that people would be interested in caring for and harvesting one of these gardens again?
23. If so, do you have any suggestion or advice on where the garden should be located?
24. Do you feel that industrial activities such as logging have had an impact on root gardens and if so, what impact do you think it has had?
25. Do you have any suggestions on how people could manage their resources differently in order to minimize these impacts?
26. Do you know of any stories about root gardens or the plants that grow there?
27. Do you remember people caring for other kinds of gardens (potato etc.)?
28. If so, how were these gardens similar or different from the root gardens?
29. Has there ever been a garden at the school here? What did they grow?
30. Have there been changes to your diet over the years? If so, what do you think are some of the causes of these changes?

Appendix D *λ'aayaʒas* Project Comment Forms

Comment Form 3a
Elders

λ'aayaʒas Project Comment Form

Name _____ Date _____
(Optional)

Elders: were interviewed for the *λ'aayaʒas* Project.

Community members: were either involved directly or indirectly with *λ'aayaʒas* project, or observed the project in progress.

Write about (or tell me about) your experience working on the *λ'aayaʒas* Project.

1. What did you like about the *λ'aayaʒas* Project?

2. Was there anything that you didn't like about the *λ'aayaʒas* Project?

3. Was the researcher respectful when interviewing you? If so, how did they demonstrate this?

4. Do you think the *λ'aayaʒas* project is an effective way for people to be learning about root gardens and traditional food systems?

5. Can you suggest any ways to improve a project like this one?

6. What would you like people in the community to learn more about?

7. Can you suggest other ways that communities might learn about traditional food systems?

8. Do you have any suggestions for future projects?

9. Do you have any other comments or suggestions?

Kleco, Kleco, Thank you

Comment Form 3b
Community Members

λ'aayaʒas Project Comment Form

Name _____ Date _____
(Optional)

Write about your experience working on the λ'aayaʒas Project.

1. What did you like about the λ'aayaʒas project?
2. Was there anything that you didn't like about the λ'aayaʒas project?
3. Did you learn anything new? If so, what did you learn?
4. Is there anything else you that would like to learn about root gardens, or other traditional foods? And if so, what would be the most useful way to get this information (books, a presentation, posters etc.)
5. Do you think the λ'aayaʒas project is an effective way for people to learn about root gardens and traditional food systems?
6. Can you make suggestions for future projects?
7. Do you have any other comments or suggestions?

Kleco, Kleco, Thank you

Appendix E *λ'aayaʒas* Information Pages

Nuu-chah-nulth λ'aayaʒas Project Community Meeting



Would you like to help re-create a Nuu-chah-nulth root garden?
To find out more, join us on *Date at Time* at the *TBD*.

λ'aayaʒas is a Nuu-chah-nulth word meaning "growing in, on, and out of the earth". The idea of *λ'aayaʒas* project is to involve interested community members in Ahousat in the re-creation of a traditional Nuu-chah-nulth root garden of *ʒaʒiic'uqmapt* (springbank clover), *tlicy'upmapt* (Pacific silverweed), and *kuuxwapiihmapt* (northern rice root). This project was suggested by Richard Atleo, *Umeek*, who has expressed a desire to revitalize Nuu-chah-nulth food traditions as a way of restoring and maintaining important traditional knowledge about nutrition and the environment.

Historically, the Nuu-chah-nulth and other First Nations communities of coastal British Columbia maintained gardens of plants with edible roots on their estuarine tidal flats. The root vegetables provided an important food source and diverse techniques and strategies were used to sustain and enhance the productivity of these naturally occurring root vegetables and their associated habitats.

The **Nuu-chah-nulth *λ'aayaʒas* Project** is being coordinated by Jen Pukonen as part of her Graduate research in the School of Environmental Studies at the University of Victoria and you may contact her if you have further questions by phone at 725-2567 (Tofino). The project is being conducted under the supervision of Dr. Nancy Turner and Dr. Richard Atleo (*Umeek*).

Please feel free to contact Jen at any time if you have any questions or concerns about this research project. I am looking forward to meeting with you soon.

Sincerely,
Jen Pukonen

Information Page***Nuu-chah-nulth λ'aayaʒas Project***

λ'aayaʒas is a Nuu-chah-nulth word meaning "growing in, on, and out of the earth". The idea of *λ'aayaʒas* project is to involve interested community members in Ahousat in the re-creation of a traditional Nuu-chah-nulth root garden of *ʒaʒiic'uqmapt* (springbank clover), *tlicy'upmapt* (Pacific silverweed), and *kuuxwapiihmapt* (northern rice root). This project was suggested by Richard Atleo, *UmEEK*, who has expressed a desire to revitalize Nuu-chah-nulth food traditions as a way of restoring and maintaining important traditional knowledge about nutrition and the environment.

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Please feel free to contact Jen at any time if you have any questions or concerns about this research project. I am looking forward to meeting with you soon.

Contact Information**Jen Pukonen**

P.O Box 1024, Tofino, BC, V0R 2Z0, (250)725-2567
 School of Environmental Studies, University of Victoria
 PO Box 1700 STN CSC, Victoria, BC, V8W 2Y2
 (250) 721-8021, jpukonen@uvic.ca

If you have any questions or concerns about this research project that you are uncomfortable discussing with me, please contact my academic supervisor:

Dr. Nancy Turner

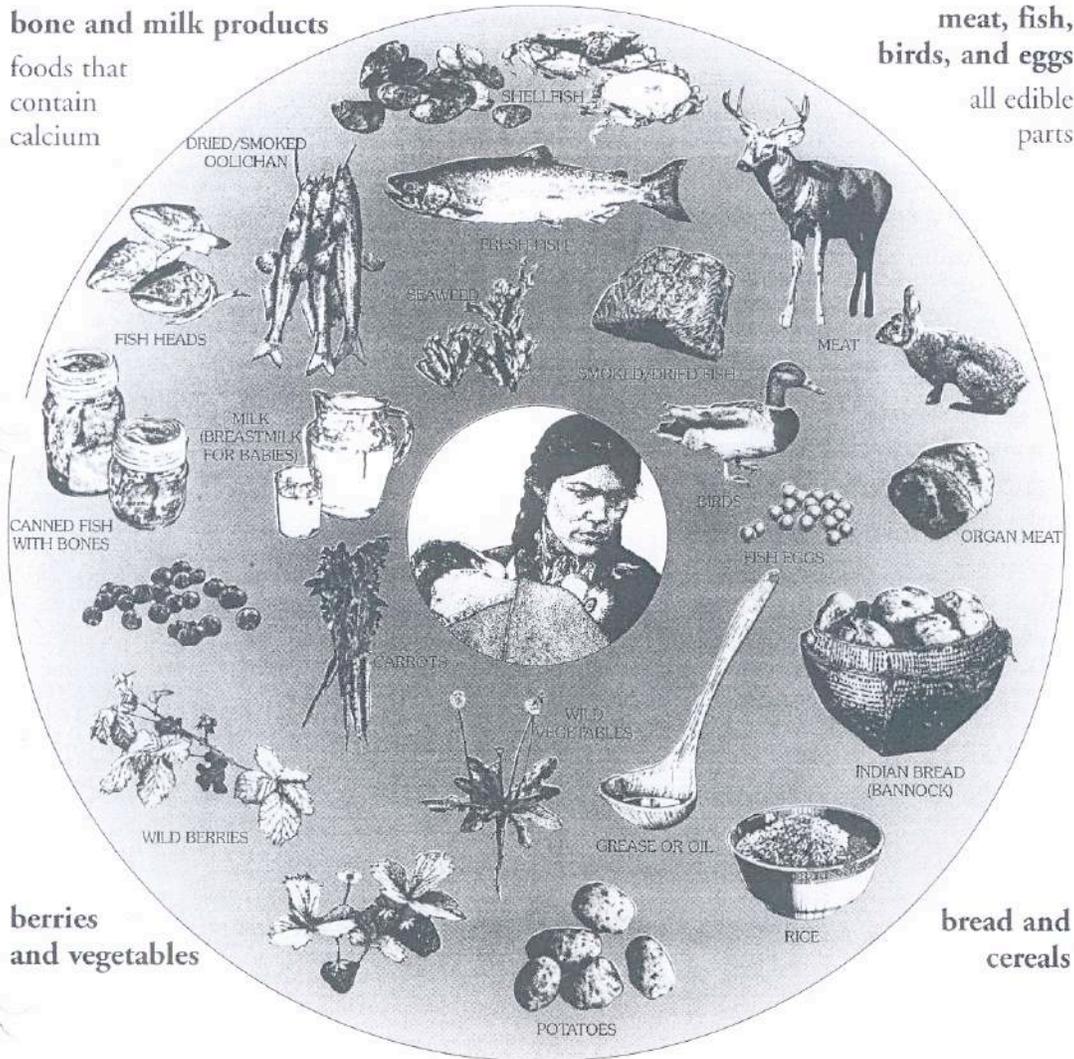
School of Environmental Studies, University of Victoria
 PO Box 1700 STN CSC
 Victoria, British Columbia, V8W 2Y2
 (250) 721-6124, nturner@uvic.ca

If you would like to verify the ethical approval for this study or raise any concerns you might have about the ethics of this study, please contact the Associate Vice-President Research: (250) 472-4545 or ovprhe@uvic.ca

Appendix F

COASTAL B.C NATIVE FOOD GUIDE

Eat a variety of foods from each group every day.



LIST OF NATIVE FOODS IN EACH FOOD GROUP

This page lists most native foods used in both coastal and interior B.C. If any native foods are missing please decide yourself which food group they go in. You will note that some foods fit into more than one food group.

meat, fish, birds and eggs

salmon
cod
whitefish
snapper
trout
flounder
herring
oolichans
smelts
char
halibut
smoked/dried fish
canned/jarred fish
herring eggs
salmon eggs
seagull eggs
clams
mussels
abalone
barnacles
cockles
sea prunes
sea cucumber
chitons
prawns
shrimp
sea urchin
eel
octopus
seal
sea lion
flippers
beaver meat
beaver tail
groundhog
mountain goat
moose meat
moose nose
moose tongue
grouse
ptarmigan
duck
rabbit
partridge

meat, fish, birds and eggs

pheasant
bear
sheep
squirrel
goose
quail
elk
caribou
porcupine
goose eggs
duck eggs
muskrat
heart
liver
canned meat
smoked/dried meat
fish soup
duck soup
stew



bone and milk products

bone marrow
fish bones
fish heads
fish tails
milk
breastmilk (for babies)
canned salmon with bones
fish head soup
seaweed
shellfish
smoked/dried oolichans
with bones

berries and vegetables

wild celery
watercress
wild asparagus
bitter root
camus
rosehips
sunflowers
onions
potatoes
carrots
fiddleheads
fern shoot
mushrooms
pigweed
stinging nettles
dandelion greens
seaweed
apples
soapberries
huckleberries
cranberries
blueberries
strawberries
wild rhubarb
raspberries
saskatoons
gooseberries
blackberries
thimbleberries
edlerberries
currants
wild crabapples
oregon grape
wild cherries
wild plums
salalberries
salmon berries
bunch berries
choke berries
black caps
red caps
Indian ice cream
dried berries
canned/jarred berries

bread and cereals

rice
rice root
Indian bread
(bannock)
cooked cereal
(oatmeal/mush)



other foods

sap
Indian tea
cedar bark
inner bark
oolichan grease
bear grease
deer grease
moose fat
seal grease



BC Aboriginal Network On Disability Society

1179 Kosapsum Crescent, Victoria B.C. V9A 7K7 • Phone: 1-250-381-7303 • Fax: 1-250-381-7312

Appendix G Ida Jones' pit cooking recipe

Pit-Cooking, Ditidaht Style: Step-by-Step

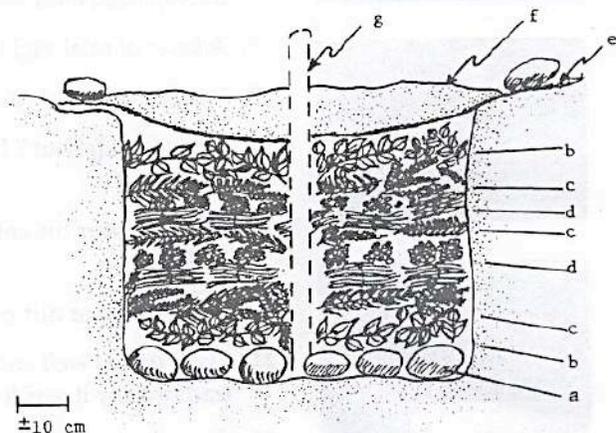
This method is modified from traditional Ditidaht cooking style – with thanks to Mrs. Ida Jones of Port Renfrew

Equipment

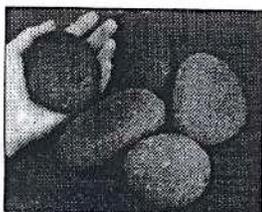
- gloves
- clippers
- shovels
- salal
- sword fern fronds
- cooking rocks (about 30 hard, round, medium-sized, about 10-15cm across)
- large wooden stick or post, about 2 m long and 5-8 cm across
- water (about 3 litres—full ice cream bucket)
- food to be cooked (small, whole potatoes; medium-sized cooking onions; small whole carrots; garlic; taro; beets; turnips, etc.)
- heavy canvas tarp, or burlap sacking
- matches, and fuel, enough to burn a very hot fire for about 1.5 hours
- platter or tray to place cooked food on for sampling.

Diagrammatic representation of a steam-cooking pit of the type used traditionally for clover and silverweed "roots" (Nitinaht):

- a. red-hot rocks (rounded, from the beach);
- b. salal (*Gaultheria shallon*) branches;
- c. fern fronds (bracken—*Pteridium auilinum*, and sword fern—*Polystichum munitum*);
- d. edible "roots," in criss-crossed bundles;
- e. old mat, or canvas or burlap sheet;
- f. sand;
- g. central post (removed to allow channel for water).



Method



1. Collect two large bags each of salal branches and sword fern fronds.
 2. Dig a pit (about 60cm deep, and 1 m across).
 3. Light a hot fire at the bottom of the pit.
 4. Put in the rocks to heat up in the fire (usually takes an hour or more; and fire needs to be carefully tended to keep it hot; may need fanning, because, being in a pit, it may be oxygen-deprived).
 5. When rocks are red-hot, remove unburned wood with a shovel or tongs.
- The next steps must be done very quickly. Have the salal and sword fern divided in two piles, one for under the food, and one for over the food.
6. Place the post upright in the bottom of the pit (you may need to soak it in water so it does not burn).
 7. Spread the red-hot rocks over the bottom and scatter a little dirt over them.
 8. Place a layer about 10 cm thick of salal branches over top of the rocks (you may want to soak the salal in water to keep it from burning).
 9. Place a layer of sword fern fronds over the salal.
 10. Place a layer of food (small potatoes) on the fern fronds.
 11. Another layer of fern fronds.
 12. Another layer of food.
 13. Another layer of fern fronds.
 14. Another layer of food.
 15. More fern fronds (note: you can have just one layer of food, or several, interspersed with sword fern fronds).
 16. A layer of salal, right to the top of the pit.
 17. Pull out central post.
 18. Add water (about 3 litres) through the channel left from the post being pulled out.
 19. Quickly cover the entire pit with a large sheet, or mat, seal the edges with rocks.
 20. Shovel sand or dirt overtop until no more steam is escaping.
 21. Mark the pit well and leave for several hours (2 to 5 hours, or more; traditionally it was left overnight).
 22. Carefully uncover the pit and retrieve the food.
 23. Carefully seal over the pit so no one falls into it.

Appendix I HaShilthsa Article 2006

Page 10 - Ha-Shilth-Sa - February 1, 2007

ƛ'aaya-as Project:



(Above from left to right) kuuxwapiihmaptand (riceroot), Ƶ a Ƶ iic'umqapt (springbank clover) with rice root behind, and tlicy'upmapt (Pacific silverweed).

Growing Nuu-chah-nulth root vegetables

Many generations of Nuu-chah-nulth people have relied on local resources to provide a healthy and sustaining diet. Root vegetables growing in tidal flats and at river estuaries were an important part of that traditional diet. These included kuuxwapiihmaptand (riceroot), Ƶ a Ƶ iic'umqapt (springbank clover) and tlicy'upmapt (Pacific silverweed).

Tasty and nutritious, these roots were carefully tended and nurtured to make them as productive as possible. More recently, the Nuu-chah-nulth diet has changed, and these roots are not as well known today. Yet they are still growing, and could still provide nutritious food.

My name is Jen Pukonen and I have been working with the Raincoast Interpretive Centre (RIC) in Tofino for the past five years. My experiences with the RIC inspired me to continue my education in a way that I hope will be meaningful to local communities. I am now working together with the community of Ahousaht on the ƛ'aaya-as (TI'eye-yuh-us) project, as part of my graduate program in the School of Environmental Studies at the University of Victoria.

The ƛ'aaya-as Project was suggested to me by Ha'wilth Umeek, Richard Atleo, to help revitalize these Nuu-chah-nulth food traditions as a way of promoting and maintaining important traditional knowledge about health and the environment. ƛ'aaya-as is a Nuu-chah-nulth word, suggested by Trudy Frank and Lena Jumbo of Ahousaht, that means "growing in, on, and out of the earth," and refers to a garden.

Root gardens like the ones we are restoring were historically important to First Nations all up and down the coast. For the Nuu-chah-nulth, the gardens were part of the hahuulhi system of ownership and chief's responsibilities. The roots were highly valued as an important food source, and were often eaten in large quantities at feasts.

To produce enough of these roots to feed the communities, the Nuu-chah-nulth would carefully tend their gardens, weeding out other plants, churning the soil with special digging sticks, and selectively harvesting and replanting rootlets for the next year's harvest. Like most Nuu-chah-nulth food practices, this type of gardening was sustainable in the long-term, producing an abundance of food without making a negative or lasting impact on the land. River estuaries and tidal marshes are one of the most productive types of habitat and were ideal for the gardens.



Jen Pukonen

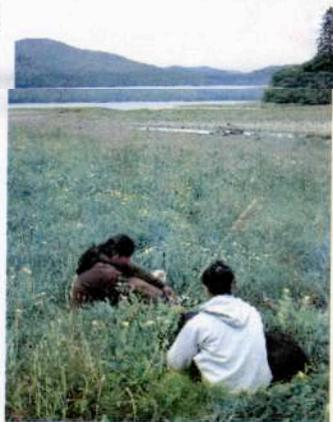
Through the ƛ'aaya-as Project we have involved interested students and community members in Ahousaht in the research and re-creation of a Nuu-chah-nulth root garden of kuuxwapiihmaptand, tlicy'upmapt and Ƶ a Ƶ iic'umqapt. In developing the root garden, Ahousaht community members have been involved at all stages of the project to ensure that it is appropriately designed and developed.

From demonstrating steam pit cooking as a traditional method for cooking the roots to the outdoor education class painting a mural on the wall beside the garden, there have been so many great ideas and suggestions that have made the project really special. This past summer, five high school students, Kayla Little, Janelle Louie, Kara-Anna Adams and Dion and Austin Keitlah, worked on the ƛ'aaya-as Project. The fieldwork included getting to know local plants, planting, tending and monitoring a root



Student paint a mural on a wall beside the garden.

garden and preparing a poster about root gardens for the school. It was lots of fun. We also spent time talking to people in the community to learn about traditional plant foods and management techniques and to gather ideas, suggestions and feedback about the ƛ'aaya-as Project. We are hoping especially that the students at the Ahousaht School will learn about ƛ'aaya-as and the Nuu-chah-nulth root vegetables.



Kayla Little and Janelle Louie enjoy the Atleo River.

This spring we will be giving a slide show in Ahousaht and Tofino to share stories and pictures from the past year and will keep you posted for the details.

It is a real honor for me to be working in Ahousaht and on Nuu-chah-nulth territory. Kleco, kleco to the community of Ahousaht for your time, enthusiasm, patience, humor and

friendships. If you have any questions, comments or suggestion please feel free to contact Jen at or (250)725-2567.



Kayla Little, Janelle Louie, Kara-Anna Adams and Dion and Austin Keitlah, worked on the ƛ'aaya-as Project. The community has been involved at every stage along the way in developing the garden.

Appendix J HaShilthsa Article 2007

Nuu-chah-nulth Food Celebrated

Nuu-chah-nulth people are some of the best cooks around. On November 10th, 2007, in the beautiful community of Ahousaht, Nuu-chah-nulth cooking traditions and foods were the focus of the day. Jen Pukonen, a Masters student at the University of Victoria, hosted her 4th steam pit-cooking event on the sandy shores of Flores Island using a recipe from Ida Jones of Pacheedaht. Participating in the day's events were Nancy Turner, renowned ethnobotanist and Richard Alteo, Ahousaht Hawildh, both advisors to Jen, several UVic students, curious and helpful community kids and Uu-a-thluk (NTC Fisheries) staff.

The rainy cold day did not stop participants from contributing to the day's success by collecting rocks, harvesting plants and patiently tending to the steam pit. After many hours the steam pit produced the sweetest and tastiest root veggies consisting of carrots, yams, onions, potatoes and garlic along with Nuu-chah-nulth traditional roots, ʔaʔiits'uqmapt (springbank clover), tliɥs'uɥmapt (Pacific silverweed) and kuuxwapiihmapt (northern rice root).

Jen would like to thank everyone who helped out and came to enjoy the delicious food.



Nancy Turner digging the hole for the steam pit.



Dion and Austin Keitlah helping Nancy collect salal and sword ferns.



Everyone helps to quickly place layers of salal, ferns and veggies into the pit before it is covered by burlap sacs and sand to trap in the steam.

www.uuathluk.ca



Enjoying hot fish chowder, upskwee and a variety of other traditional and non-traditional foods.



Kayla Little one of Jen's many helpers is ready to dig into some of the traditional roots.

Uu-a-thluk Cookbook Project

What's cooking in your kitchen? Uu-a-thluk (NTC Fisheries) is producing a Nuu-chah-nulth cookbook, and you could be one of the featured contributors! Uu-a-thluk is looking for traditional and contemporary recipes that use the delicacies and foods found all around Nuu-chah-nulth Ha-houltsee from blackberries, to salmon, to sea vegetables, to chitons, to barnacles and so on. The cookbook will demonstrate the strong Nuu-chah-nulth connection with sea resources, and promote healthy eating.

We are looking for:

- 1) Recipes of traditional foods prepared in traditional and modern ways
- 2) Methods for harvesting and preparing foods
- 3) Stories and photographs of food

Please send recipes and information for consideration to the NTC Fisheries Office in Port Alberni, or fax to 250.724.2172, or email to info@uuathluk.ca. Please include your name and telephone number so we can contact you. For more information contact Val Gallic at 250.724.5757 or visit www.uuathluk.ca



NTC Fisheries
Uu-a-thluk
 Taking Care Of