Project Title: **Integrated Demonstration Project for Non-Timber Products**
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FINAL REPORT 2002-2003

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I. Abstract

The Non-Timber Forest Products (NTFP) Demonstration Project is an applied research project designed to address the complex issue of how best to manage non-timber forest resources in a way that is environmentally sustainable, economically viable and socially equitable. The project does this through a multi-tiered approach that incorporates resource inventory, research and policy analysis along with capacity building for First Nations and non-First Nations and business development assistance for local entrepreneurs. Project partners and collaborators include First Nations, federal, provincial and local government agencies, the forest industry, the NTFP industry, universities and colleges and non-profit organizations. The project is based on Northern Vancouver Island.

II. Key Words

Non-timber forest products, forest management, economic diversification, capacity building, Northern Vancouver Island, native plants, wild mushrooms, salal, ferns, moss, First Nations, co-management.

III. Project Report by Deliverables

III.A. Deliverable: *Evaluation of known effects of silviculture and cutting systems on NTFPs*

Key Researchers: Charlotte Bell and Dr. Bill Dushenko

Activities

A review of applicable literature on the effects of silviculture and cutting systems on NTFPs was conducted, focusing on the west coast of Canada and the Pacific Northwest of the United States.

Results/Outcomes

Although literature on non-timber forest products (NTFPs) in the Pacific Northwest has grown substantially in the last decade, there have been relatively few studies investigating the effect of specific forest practices on the abundance, occurrence and ecological health of NTFP species, or for the sustainable co-management of both commercial timber and NTFP species. Conventional forestry and agroforestry perspectives provide some insights in this area, but success in the sustainable development of NTFPs also requires theoretical and applied science applications that work with ecosystem structure and function.

Research on Vancouver Island into the impacts of silvicultural treatments, over the timeframe of a full rotation, found that canopy cover has a strong influence on the cover of shrubs but no influence on the cover of herb and moss layers. Although thinning changes understory composition, early thinning without subsequent treatments has been found to be unlikely to maintain stable herb and shrub populations. Successful models have been developed by researchers to predict vegetation cover of salal, salmonberry and thimbleberry in Douglas-fir stands, ten years following tree planting using various site preparations. Abundance of some shrubs, including huckleberry, has been linked to increased light and nutrients available after

timber harvest, and to light broadcast burning, while other opportunistic species, such as salal adapt to either shade (e.g., mature forest) or non-shade conditions (new forest openings) with increased vegetative productivity under increased canopy cover.

Information on moss as an NTFP resource is relatively scarce although its demand in floral and other industries is growing. Epiphytic mosses are the main focus of industries in Pacific Northwest states such as Oregon where permitting, inventory and monitoring methods are being developed. Positive factors for epiphytic moss production include older forest age classes, lower elevations, high hardwood basal area; negative factors include salal and high conifer basal area.

Fungi, a multi-million dollar industry in B.C., are influenced by microclimate, seasonal variation and forest successional stage. As many as 30 to 40 species can occur in a given forest stand. Unsustainable mushroom harvest can reduce species diversity and productivity and needs to be addressed with further research in this area. Large clear-cuts can interfere with mycorrhizae re-establishment, while the maintenance of smaller cuts, forest islands, and soil integrity are all key to this process. Wild pine mushrooms in B.C. have been found to be most abundant in previously harvested areas or in unlogged areas with relatively open canopies (younger seral stands) and abundant coarse woody debris.

Applicability, contribution to knowledge and recommendations for further research
Some forest practices mimic aspects of natural processes and disturbance, and can increase habitat- (niche) and biological diversity with potentially positive effects on NTFPs. Given the uncertainties associated with NTFPs, adaptive management is key, with approaches applied on a case-by case basis. Adaptive management needs to be supported by regular, integrated environmental monitoring and modeling to aid in decision-making. The potential exists to adapt silvicultural methods to promote the sustainability of NTFPs through the adaptation of existing indicators in monitoring trials.
Please see Deliverable III.E for additional research carried out on aspects of timber/non-timber co-management.

III.B. Deliverable:
Write and publish quarterly project newsletters

Key Researcher: Diane Carley

Four newsletters were published, distributed to an electronic mailing list of some 280 recipients and posted on the project website. The newsletter and website have contributed to provincial, Canadian and international awareness of NTFP issues and opportunities and to creating linkages among researchers, practitioners, First Nations and other rural communities, students, and the NTFP industry. The newsletters are attached as Appendix A.

III.C. Deliverable: ***First Nations Activities***

1) Recruit, train and supervise Aboriginal NTFP Coordinator and Intern
2) Recommendations developed for LEK/TEK in NTFP management in the region

Key Researchers: Kelly Vodden, Melvin Hanuse, Harry Alfred, Dawn Cranmer, Dr. Darcy Mitchell

The following report will focus on the above deliverables, however it should be stated that First Nations project partners were an important part of all aspects of the research, ranging from field trials to market development and extension. First Nations involvement in the development of the NTFP certificate curriculum and associated activities (funded from sources outside FRP funding) is described under Section III.I.

1. Recruit, train, supervise First Nations NTFP coordinator and intern

Activities/Results
Project staff assisted the 'Namgis First Nation to develop a proposal to the First Nations Forestry Program to support a part time NTFP coordinator and intern to work with all North Island First Nations. Melvin Hanuse was hired as the Coordinator in August 2002, and Dawn Cranmer as the Intern in September. (Project funds were also contributed to the 'Namgis First Nation to help support the Coordinator and Intern positions.) Both the Coordinator and Intern are members of the 'Namgis First Nation and have developed skills and an ongoing interest in the field of non-timber forest products as a result of their positions. Upon completion of their contracts both plan to continue to pursue education (through the Royal Roads NTFP Certificate Program) and self-employment endeavours in NTFPs. Melvin, Dawn and supervisor, Harry Alfred, participated in a wide range of project activities, from assisting with salal fertilization and fern harvest trials to developing the NTFP training program and co-organizing two training workshops for local (Indigenous and non-Indigenous) Instructors for the NTFP Certificate Program (described below in Section III). Harry's involvement in the project has provided him with knowledge of NTFP values that is directly applicable to his work as a land use planner for 'Namgis First Nation.

Outcomes and Applicability of Results
In addition to the personal development and learning gained by these individuals significant outcomes of their work included:

- the establishment of a North Island First Nations NTFP steering committee which includes: 'Namgis First Nation, Kwakiutl First Nation, Quatsino First Nation, Gwa'sala-'Nakwaxda'xw First Nation, and Musgamagw Tsawataineuk Tribal Council;
- initial documentation of traditional plant use for medicinal purposes and plans for further research in this area;
- the development of a "Draft Strategy Relating to the Development of a Non-Timber Forest Products (NTFPs) Economy for First Nations Communities in the Northern Vancouver Island Region;
- development of a school program relating to NTFPs; and
- discussions regarding the role of First Nations in managing NTFPs within their territories and the significance of NTFPs from a treaty perspective.

Contribution to knowledge gap

These results are an important contribution to the continued development of First Nations strategies and capacity building for sustainable utilization of NTFPs in cultural, subsistence and commercial applications.

Key Operational Variances
None

2. Recommendations for integration of LK/TK in NTFP management in the region

Activities
A working paper (to be submitted in final form for publication) has been developed and is being circulated for comment among the NTFP project team and collaborators. The authors consider the issues of incorporating Local and Traditional Knowledge in NTFP management in both global and local contexts, drawing from three key sources: 1) a growing body of relevant literature, 2) their own collective experiences, and 3) lessons learned from three interrelated NTFP research and development projects on northern Vancouver Island, British Columbia. The paper concludes with recommendations for incorporating local (LK) and traditional knowledge (TK[1]) in NTFP development. The paper specifically recognizes the challenges to effective incorporation of local and traditional knowledge in NTFP management that arise in the context of poorly defined physical and intellectual property rights in non-timber forest products as well as the implications of the ongoing treaty negotiation process in British Columbia. FIA work on this deliverable has been supplemented by research on traditional plant use and strategies for First Nations involvement in the NTFP sector funded by First Nations Forestry Program through 'Namgis First Nation. Funding for further work on collecting traditional knowledge of NTFPs is currently being sought.

[1] TK is an extension of the more common term TEK. While TEK refers to traditional "ecological" knowledge, TK is intended to recognize the broad, holistic nature of this knowledge – including ecological, but also economic, political, cultural, social aspects etc. LK is distinguished from TK to acknowledge the unique multi-generational nature of traditional knowledge held by First Nations peoples about their territories.

Results

Key points raised in the working paper include:

- Local and traditional knowledge of NTFPs in the region is valuable to NTFP managers in many respects, providing information about markets, non-market values, harvesting locations and volumes, areas appropriate for inventory and monitoring, harvesting techniques, ecosystem impacts, informal property rights, management and stewardship options.
- Concern exists about the misuse and exploitation of local and traditional knowledge, particularly knowledge relating to First Nations medicinal plant use and to economic, harvester and species location information related to commercial industries.
- Local knowledge, like other knowledge forms, requires confirmation of validity and can be strengthened by integration with other types of knowledge.
- Specialized local and traditional knowledge is held by few individuals and as such is highly vulnerable. This is particularly true of the knowledge of the elders. Significant gaps remain in traditional knowledge recorded to date.
- Mutual respect, two-way information flow and incentives for information sharing are key considerations.
- Accessing multiple sources of local knowledge using a range of methods is a recommended strategy.
- First Nations hold unique rights and obligations that must be recognized among NTFP "players" in the region.
- Interest in traditional foods and medicines, both within First Nations and non-First Nations communities in the region, is growing and with it local knowledge is increasing and being "brought to the surface."

Outcomes/Applicability

Recommendations for integrated local and traditional knowledge into NTFP management are broken into three sections: 1) integrating knowledge systems through collaborative management strategies, 2) measures for preservation and enhancement, and 3) methods and protocols for gathering, documenting and sharing local and traditional knowledge.

The first category recognizes that the most effective way of ensuring integration of local and traditional knowledge is through the involvement of the holders of such knowledge in the management process/structure. The formation of a North Island NTFP Centre, NTFP Sector Council and First Nations NTFP Steering Committee, with strong local and First Nations involvement, builds on the network of collaborators and partners that have been established through the North Island NTFP Demonstration project and earlier work by the project team in the region. These structures are key step in the direction of collaborative NTFP management in the region. Also promising is the design of an NTFP management pilot project for the region. It is recommended that the pilot ensure local and First Nations interests are well represented in the proposed management structure (indications are that this will be the case).

Second, concerns about the vulnerability of local and traditional knowledge are addressed. Recommendations include education initiatives, particularly within First Nations communities, a

significant research and documentation program to collect and preserve NTFP-related knowledge, mentorships, and measures to ensure inclusion of English as a second language speakers in discussions of NTFP management.

Finally, given concerns about the misuse of local and traditional knowledge and confusion surrounding the many potential audiences for and uses of LK and TK clear and agreed upon methods and protocols for the collection and use of LK and TK are recommended. Particularly important is a clear understanding of the intent and objectives of efforts to collect such knowledge. Three categories of information are suggested: restricted, conditional access and public access, each with their own procedures for information handling and sharing. Recommended procedures and protocols build on those of both local and provincial/national institutions.

Contribution to knowledge and recommendations for further research
The distribution of the working paper and the draft recommendations contained within it is a first important step in reaching an agreed upon regional protocol for integrating local and traditional knowledge into NTFP management. Once discussed and agreed upon by First Nations and other local partners the recommendations will feed directly into policy development initiatives such as the NTFP Management Pilot Project (project number) and into future NTFP research and development endeavours.

Key operational variances
There were no key operational variances from the project deliverable.

III.D. Deliverable:
Inventory methodology for key NTFP species – develop and assess on Site 2

Introduction
The primary research objective for 2002/03 was to build on the NTFP species inventory database for Northern Vancouver Island (NVI) for important NTFP plant and fungal species identified in our past investigations. The past work recommended that further inventory work be undertaken that focuses on identifying site factors that influence individual NTFP species' distribution, quality and abundance. Moving from a multi-species to a single-species focus would enable more detailed investigations of species/habitat relationships and corresponding inventory and management implications. Of the numerous NTFP species identified in the NTFP inventory work conducted in year one of this project, those currently the most widely harvested from Northern Vancouver Island include the Pacific golden chanterelle (*Cantharellus formosus*) and salal (*Gaultheria shallon*). For this reason, we chose to focus our research efforts on these species this year. The past inventory work indicated that the greatest commercial salal opportunities were located on Western Forest Products' (WFP) TFL 6. Consequent research on salal was therefore concentrated on TFL 6.

Salal
After conducting some preliminary surveys of productive salal habitat during the second quarter of the project timeframe, it was determined that commercial salal opportunities on TFL 6 were primarily associated with areas that had been fertilised as part of WFP's extensive operational silvicultural and research projects on TFL 6. It was thus concluded that co-management research

in thinning and fertilizing be coordinated with salal inventory activities. ***Please see Deliverable III.E. below.***

Mushrooms
Mushroom inventory and research is reported below under Deliverable III. H.

III.E. Deliverable:
Identify co-management opportunities and develop detailed project proposals for NTFP/timber co-management, including whole plant salvage, fertilizing and thinning and sustainable harvesting of mosses

NOTE: RESULTS UNDER PARTS 2 AND 3 OF THIS DELIVERABLE ARE NOT TO BE PUBLISHED FOR TWELVE MONTHS – ABSTRACTS AND KEY WORDS ARE ATTACHED

Key Researchers: Wendy Cocksedge, Brian Titus, Tyson Ehlers, Evan MacKenzie, Rob Countess, Charlotte Bell

Activities
Project activity extended beyond identification of co-management opportunities to the implementation of the first stage of a whole plant salvage project (ferns and mosses) and the first stage of a salal fertilization study. The project also provided continued assistance to a graduate student to study the effect of silvicultural practices on moss regeneration.

1. Native Plant Salvage Harvesting Trials; road extraction viability

Key Researchers: Wendy Cocksedge, Eric Gagne, Rob Countess

Introduction
Native ferns, as non-timber forest products, are currently harvested in BC for the nursery industry. The industry provides potential stable income for rural communities, but due to questions of sustainability, the industry has decreased over the past three to five years. Exploration of the industry indicated a market for salvaged wild ferns, thus using co-management with forest companies, proposed logging roads were identified on 9 cutblocks. 12 local assistants were trained and timed in the harvesting of over 9000 ferns. Results demonstrated that the harvest of native ferns on proposed roadways provided economic potential for community members.

Native ferns, such as deer fern (*Blechnum spicant*) and sword fern (*Polystichum munitum*) are highly desired products in the nursery industry, for use in landscaping and restoration. Until the past 4 or 5 years, most of the commercial ferns were wild-harvested, however with the advent of successful nursery propagation, the demand for wild harvested ferns has decreased. This decrease is due mainly to the question of the sustainability of whole plant extraction from the forests. However, as with other non-timber forest products, if managed correctly the wild fern harvesting could be a sustainable and viable industry for the North Island community.

Whole plant extraction prior to logging road development is a salvage operation which can potentially be used to increase economic activity through co-operation with land managers. Trials were held to determine the economic valuation of road-salvaged whole plant removal of *Blechnum spicant* and *Polystichum munitum* from TFL 6 on Northern Vancouver Island.

Activities

Market exploration

Exploration of the marketing and business development portion of the salvage proposal began in the summer of 2002, with the primary goal to determine the economic viability of activity being generated through the harvest and sale of salvaged ferns in the North Island. Written literature was surveyed. Interviews were conducted with three of the largest native plant wholesale nurseries in BC, the BC Nurseries and Landscapers Association, and known authorities in the field.

An exploration of the product included a comparison of bare-root and potted sale opportunity, Cash modelling scenarios took into account factors such as storage, moving, high transportation costs from the North Island and losses due to weather.

Notification, preparation, storage, transportation, and payment methods for this industry were determined.

In an attempt to determine market size for salvaged bare root ferns, over 30 wholesale nurseries were contacted throughout Vancouver Island and the lower Mainland. In addition we contacted 8 US nurseries located in Washington State. Interviews included discussion of fern market potential, as well as moss and other requested wild harvested species.

Fern availability was presented to over 30 BC nursery wholesalers and arrangements were made for the sale of the salvaged product to two Vancouver Island and three Vancouver nurseries, the Vancouver Parks Board nursery and one retail customer. The intent of the sales was to mimic a small entrepreneurial business, as would be initiated on the North Island, and through the sales determine the true quantity and quality demands, average returns, and industry process and requirements.

Data Collection and Capacity Building

Maps were obtained from Western Forest Products which identified all of the currently proposed and flagged logging roads for TFL 6. This information was filtered using the 2001 Botanical NTFP Inventory data, which allowed for predictions to be made as to which cutblocks would contain adequate fern coverage for the trials. From the predicted list of "best bets", selected sites were reconnaissanced and 9 cutblocks were chosen for the trials.

Plots were established every 100m along the proposed roadway in 9 cutblocks, with 50m lengths marked, in preparation for harvesting trials (see FII 2002-03, Native Plant Salvage Harvesting Trials; block extraction viability project).

Results

Market exploration

Our initial findings were that whereas ferns in the past were mainly purchased from wild harvested stock, the current industry preference was for propagated stock due both to the resulting uniform appearance and to the questions of sustainability of wild harvested plants. However, cultivated ferns require greater investment; initiation to sales for cultivated ferns is generally two to three years compared to an initiation to sales of bare root stock of one to two years. Further, we were able to specify that all product was from salvage plots as part of the research program. Therefore, we found there to be sufficient interest in the product to continue the trials.

While we were unable to determine with any accuracy the overall size of the market for bare root product in BC we had initial indications that this market could accommodate 50,000 to 100,000 salvaged bare roots per annum. Price and current restoration and landscape activities seemed in many cases to be the determining factor. In the case of US nurseries we found little enthusiasm for purchasing Canadian product mainly due to the fact that they already had established sources of supply and were wary of cross border economic liabilities.

The cash modelling determined that bare-root provided the optimum method to enter the wholesale market. Initial indications were that cost factors combined to make a potted plant - or nursery - operation uneconomic unless entered into on a large scale. This scenario may change once a bare root harvest and sale program was up and running, and partial deliveries of potted ferns to retail nurseries were combined with deliveries of bare roots to wholesale nurseries. Further study would be required to determine viable options.

We determined that the market for bare-root fern product could be expanded if contact was made prior to harvest. The demand for larger sized bare-root was considerably smaller than the normal one-gallon size, but did exist and netted a larger price. The demand was also apparent for small volumes of other wild harvested plants, such as aquatics, *Rubus* sp, and *Rosa* sp. It was important that the harvester establish a connection with the buyer and bring small volumes of wild-harvest as sample to develop a market.

Data Collection and Capacity Building

Road length within each cutblock ranged from 500m to 2000m, and averaged 1000m for most of the 9 cutblocks selected.

The ecosystems which demonstrated the highest presence and abundance of both the sword and the deer fern were the S1ha, S3, S12 and S13, based on the Lewis System Classification as used by Western Forest Products (equivalent to the B.C. Ministry of Forests Biogeoclimatic Ecosystem Classifications of, respectively: 01 HwBa, 07 BaCw, 05 BaCw/04 CwHw, and 07 BaCw/05BaC2).

An average of 12 to 15 roads are developed annually within TFL 6. The sample of road construction in TFL 6 during 2001 showed that over 60% of the roads built were on viable fern habitat. This translates to approximately 13.5 ha of area available for whole fern extraction in

one year. It should be noted that these results would change yearly, as the ecosystem roaded is highly dependent on markets and current timber availability.

Outcomes, applicability and recommendations for further research
There appears to be a strong market in BC and a strong product base for whole plant extraction – particularly *B. spicant* and *P. munitum* – on the North Island. The market for the ferns is somewhat flexible based on demand and current large-scale projects, although it appears possible to saturate the market. It is recommended that further exploration of the true potential size of the market be explored through interviews with current and future whole plant harvesters.

Although fern harvest was found to be economically viable in the cutblocks which were sampled, the limited kilometres of road which are completed by a forest company in a year, during the growing season, may limit the opportunity for harvest. It is therefore recommended that salvage and sustainability potential be explored for within the whole cutblock, again using co-management by coordinating with cutblock development.

2. Silvicultural practices and moss regeneration

Key Researchers: Charlotte Bell, Bill Dushenko, Eric Gagne

Activities

This study investigated the response of moss to forest practices at the forest stand level in Western Forest Product's TFL 6, Port McNeill, BC. Moss and other ground cover species were recorded for abundance in forest stands that were, in 2001-2002, between 2 and 82 years post-harvest. A mature stand and a recently harvested cutblock were sampled to provide overall control to the chronosequence. This research provides a retrospective look at moss richness and abundance influenced by forest age class, treatment type, and ecological association with other vegetation. The research framework also examined social considerations important in the development of moss and other NTFP species.

Results, Outcomes and Applicability

Forest licensees leave very little productive forestland un-treated by juvenile spacing. This situation produces a dearth of control sites needed for timber and non-timber co-management field studies. An important innovation would be the establishment of permanent, experimental plots within TFL 6, designed specifically to facilitate NTFP-silviculture co-management studies. NTFP experimental plots would maintain adequate untreated control adjacent to monitored treatment plots. The proposed experimental plots could be used to monitor all NTFPs including salal, ferns, and mushrooms, moss, etc.

The plots would need to be large enough to provide areas clear of obvious edge effects, such as increased light from adjoining cutblocks. There are costs incurred by setting aside productive forestland, and in establishing and monitoring permanent plots. Funding sources to help offset these costs might include the provincial Forest Investment Account and federal funds targeting forest industry adjustment and supporting value-added forest products.

Contribution to knowledge gap and recommendations for further research
An essential next step is to run co-management field trials where potential cutblocks are picked, not picked or partially picked for moss prior to timber being cut. These blocks would be monitored over time to assess moss regeneration for both abundance (how much moss comes back) and occurrence (which moss species come back). If all or some of the moss in a recent cutblock were picked for moss prior to timber harvest, we need to know the short term and longer-term impacts on biodiversity. One would expect diversity (for example, at 2 years post harvest) to be lower if moss were picked first. Before proceeding to wide-scale moss picking of blocks prior to timber harvest, it is important to know if that assumption correct. An even more important question to answer is whether picking moss prior to the timber cut depresses moss diversity at 20 or 40 years post-harvest. These field trials could potentially apply to other species as well such as ferns.

We cannot develop ecologically sustainable NTFP harvests without science-based resource management prescriptions. Developing the science is essential, but long-term pure research in the field will be difficult, if not impossible, to fund. The approach described here reflects an adaptive management framework applied to BC (Nyberg and Taylor, 1995) and can be combined with small-scale commercial operations. Such as pilot could run in conjunction with commercial NTFP pilot work, such as the sale of salal, to help finance the harvest trials.

The ecological impact of harvesting ground mosses requires more investigation prior to any large-scale implementation of harvesting moss as an NTFP. The only type of commercial implementation that should be considered at this time would be pilot projects, guided by the principles of adaptive management. The primary outcome of the pilots would be increased understanding of the ecological requirements and resource management strategies needed, while a secondary goal would be sale of the moss and other NTFPs to pay the NTFP harvesters, promote rural economic diversification, and help cover the costs of the pilots.

There are many factors influencing the creation of an ecologically, economically and socially sustainable NTFP industry. The next phase of the Integrated Demonstration Project for Non-Timber Products will provide increased knowledge and understanding of both the potential and the limitations of NTFPs in actively managed coastal forests of British Columbia.

Key Operational Variances
Research activity significantly exceeded the proposed deliverable.

3. Salal Fertilization – Timber Co-Management Study

Key Researchers: Brian Titus, Wendy Cocksedge, Annette van Niejenhuis, Cindy Prescott

Introduction
Project funding assisted with the implementation of a timber/non-timber co-mangement study as a collaborative effort of the Canadian Forest Service, Pacific Forestry Centre (B. Titus), Royal Roads University (W. Cocksedge), Western Forest Products (A Van Niejenhuis), and the Faculty of Forest Sciences, University of British Columbia (C. Prescott).

Fertilization has been shown to increase conifer seedling growth on cedar-hemlock sites on the north end of Vancouver Island. It has also been observed that fertilization changes the colour and the productivity of salal in the understory. This raises the question of whether both salal and trees can be co-managed by judicious choice of silvicultural treatments so that the total merchantable value of the ecosystem is increased, not just the value of the trees. Treatments that will increase salal productivity may become increasingly important as shortages of this commercially valuable species ($55-60 million gross revenue in 1997[2]) are presently occurring through over-picking on southern and central Vancouver Island. Shortages will affect the ability of the estimated ~13,000 salal pickers in BC[1] to make an income from this natural resource.

Activities

Approach

The first step in the process of identifying co-management opportunities is to measure the amount of commercial-quality salal growing on fertilized sites, and to compare this with that on adjacent unfertilized sites. Western Forest Products, Ltd. (WFP) has established a series of 115 tree monitoring plots on 26 sites that have been operationally fertilized since 1986, to compare tree growth on operationally fertilized areas and nearby unfertilized areas. The trees on these plots are remeasured regularly, and have clearly demonstrated that fertilization leads to increased conifer growth. These plots also provided a unique opportunity to initiate a cost-effective pilot study to see whether salal productivity also increased. The 26 sites in the WFP database were visited as part of a separate salal inventory study in TFL 6. Sites were qualitatively assessed for whether or not commercial-quality salal was present and accessible. It was determined through this reconnaissance that only monitoring plots on sites fertilized (250 kg N + 100 kg P ha^{-1}) within the last 7-10 years contained commercial-quality salal.

Methods

To quantify the response of commercial-quality salal to fertilization, six sites were chosen: 2 sites were fertilized in 1996, 1 in 1997, and 3 in 1999 (Table 1). Boundaries of monitoring plots (4 to 12 m in radius, depending on conifer density) were marked in the summer of 2002. Salal within these plots was harvested in the fall of 2002 by experienced salal harvesters. In some cases, harvesters observed that no commercial-quality salal was present, so that no harvesting took place. Salal "hands" from each plot were separated into "longs" and "tips", and tagged for future identification.

Table 1. Treatment histories of sites harvested.

Variable	**Site history**					
Site & Project ID	R415	M900	R690	R448	R290	R900
Year logged	1988	1987	1987	1984	1983	1983
Time from logging	14	15	15	18	19	19
Year burned	1988	1987	1988	1985	1986	1983

[2] From Wills, R.M. and Lipsey, R.G. 1999. An economic strategy to develop non-timber forest products and services in British Columbia. Final Report, FRBC Project No. PA97538-ORE. (Available at http://www.sfp.forprod.vt.edu/pubs/ntfp_bc.pdf).

Variable	Site history					
Time from burning	14	15	14	17	16	19
Year planted	1989	1990	1989	1987	1987	1984
Time from planting	13	12	13	15	15	18
Spp. planted	Pw/Cw	C10	C10	Cw	Hw	Hw
Year of fertilization	1999	1999	1999	1997	1996	1996
Time from fertilization	3	3	3	5	6	6
# F plots	2	2	2	2	2	2
# C plots	1	3	2	2	2	2
Total # plots	3	5	4	4	4	4
Plot radius (m)	11.3	11.3	8.0	4.0	11.3	5.6
Plot size (m2)	400	400	200	50	400	100

All salal bundles were taken to a buyer (Western Evergreens, Courtenay) for processing. Salal hands were weighed, to determine sales value to harvesters. The buyer then re-sorted and packed the salal for shipping to retailers, and determined its value to the buyer.

Results

Initial data analyses indicate that commercial salal on cedar-hemlock sites can be quite valuable – up to ~$2,500 ha^{-1} (Fig, 1). One site transitional between cedar-hemlock and hemlock-amabilis had a control plot established on it by WFP because of a lack of suitable cedar-hemlock sites nearby (R415), and salal on it was valued at ~$10,000 ha^{-1}.

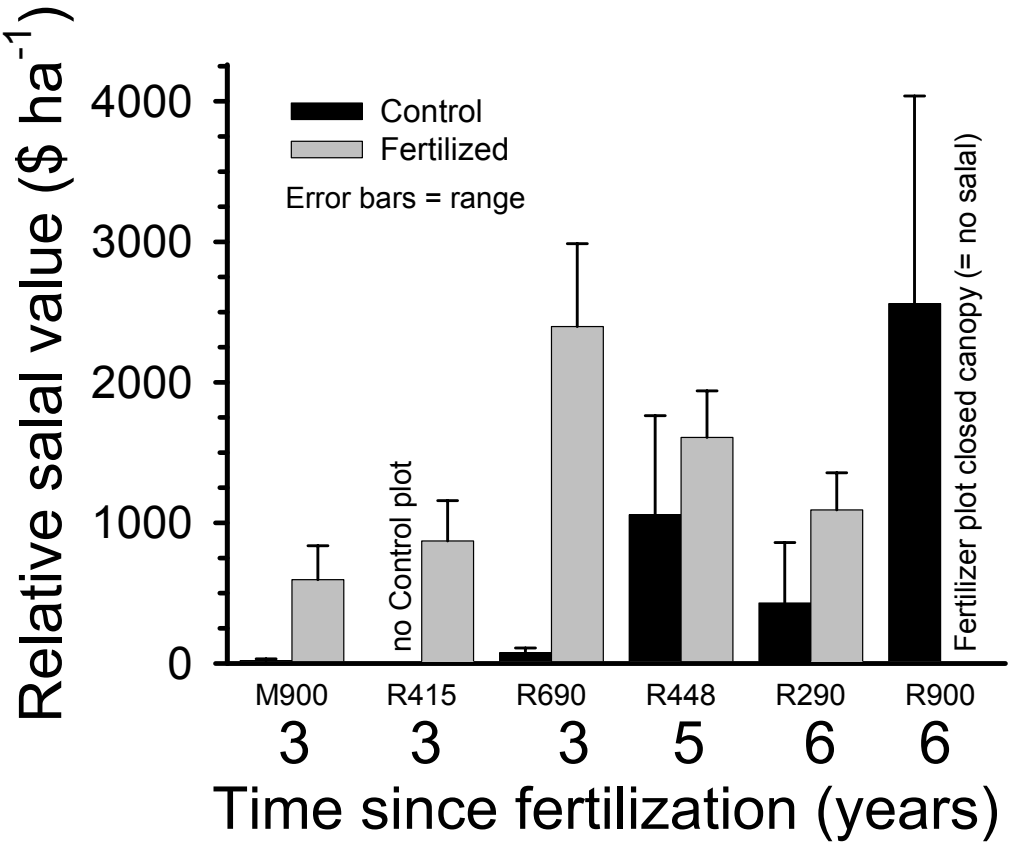

Fig. 1. Relative values of salal on un-fertilized and fertilized cedar-hemlock sites near Port McNeill.

Within the other sites, fertilization increased commercial salal production between 3 and 6 years after fertilization, but on one site (R900) increased tree growth shaded out salal by 6 years. This, and the inventory work that showed a lack of sites with commercial salal >7 years after fertilization, suggests that the salal on fertilized sites will only be available for harvesting for a limited time. Assuming that the data is representative, it is possible that annual salal harvesting over the first 6 years after fertilization could be worth ~$7,750 ha^{-1} ($500 at yr 1, $750 at yr 2, $1500 at yr 3, $2500 at yr 4, $1500 at yr 5, and $1000 at yr 6). The high value of salal on one control site (R900) suggests that unfertilized sites can also be valuable – but may take longer to reach a stage in succession when this can occur.

The length of time it took workers to harvest plots was timed, and wages were often $10-15 hr^{-1}. Notwithstanding the value of salal, this suggests that it may be difficult to recoup silvicultural

costs from leases for salal harvesting. No matter how much salal may be present on a site, it can only be picked at a certain rate, and these rates are never high.

While only a pilot study, this work points to the potential for fertilization to increase the productivity of commercial-quality salal. Weaknesses in design limit the applicability of the values obtained, which must be considered ***relative***, rather than ***absolute***, as pickers were not harvesting salal under normal operational conditions. Monitoring operational salal harvesting will yield more accurate information on harvesting rates, economic values, and site conditions.

Outcomes
This project successfully measured, for the first time in BC and the PNW, the effect of fertilizer on commercial salal.

Applicability
The results are immediately applicable, in that they draw forest managers' attention to the possibilities of co-management of timber and salal. The results are promising, and suggest that further harvesting work is warranted, to better quantify salal productivity.

Contribution to knowledge gaps and recommendations for further research
As far as can be ascertained, this is the first data in the PNW on the economic value of salal at a site level ($/ha). It has therefore contributed to a serious knowledge gap. It has shown that a different approach is needed to gather more applicable data – this time working with commercial harvesters in an operational setting, rather than having harvesters pick specific forestry plots.

Operational Variances
Project results significantly exceeded the proposed deliverable.

III.F. Deliverables:

Key researchers: Darcy Mitchell, Sinclair Tedder, Wendy Cocksedge, Sen Wang

1) Draft management recommendations for NTFPs in the region

Activities and Results
Royal Roads University is collaborating with the B.C. Ministry of Forests on the development of design options for potential NTFP management pilot projects (FIIRP funding, 2002-2003). The Port McNeill Forest District is one of the districts participating in the project, which has been facilitated by the network of collaborators and partners that have been established through the North Island NTFP Demonstration project, and earlier work by the project team in the region. In order to avoid duplication of effort and to make best use of scarce resources, the majority of effort toward this deliverable was carried out under Project R02-1078. Funds allocated to R02-25 were applied only to ensure coordination between the two projects.

A copy of the final report submitted for Project R02-1078 is attached to this report as Appendix B.

III.G. Deliverable:
Harvester Handbook draft complete

Key researcher: Wendy Cocksedge, Diane Carley

III.G. Deliverable: ***Harvester Handbook draft complete***

Key researcher: Wendy Cocksedge

Activities and Results
The harvester handbook draft is completed; copies have been circulated for comment and revisions made.

Outcomes
The handbook makes available in a concise and user-friendly format the essential information necessary for harvesters to understand the year-round opportunities for harvest of NTFP species and to undertake such work in a way that encourages both resource stewardship and financial viability.

Applicability
The handbook currently contains many of the most common commercially-harvested species in the North Island area. Many of these species are present throughout coastal British Columbia, parts of the Interior and the Pacific Northwest, so the handbook is immediately applicable across a wide geographic area.

Contribution to knowledge gaps and recommendations for further research
There is no similar guide to harvesters available in British Columbia. It is our intention to expand the guide to include more species (especially fungi) and to publish the handbook in a format that permits new species to be added easily to the content and for the handbook to be tailored to different regions and user groups. Funding is being sought for completion of this project.

Key Operational Variances
None.

III.H. Deliverable:
Data collection – additional site – fungus species

Key Researchers: Tyson Ehlers, Shannon Berch, Rob Countess

Activities
The inventory methodology for NTFP fungal species had been established over the preceding three years of this project. Since little formal scientific investigation has been done for commercial fungal species in British Columbia, the methods were simply to survey as much area in as many habitat types as possible to identify NTFP fungal species and describe their habitats.

Researchers with combined expertise in mycology and forestry surveyed each site, identified fungal species and described each site in terms of Biogeoclimatic ecosystem classification (BEC) and forest cover types. We used forest cover and ecosystem maps provided by WFP and Canadian Forest Products (Canfor) for to target a range of sites for sampling within the CWHxm, CWHvm and to a lesser extent, CWHmm and MH subzones. Sites were defined by the mapped area of forest cover polygons. In some cases new sites were described based on observed features that were not indicated on the maps.
We used the ecological descriptions from these sites to develop mapping criteria for potentially productive chanterelle habitats. In 2001/02, WFP generated a map based on these criteria using their GIS database for a portion of their forest tenure. In 2002 we tested predictions made by searching for chanterelles in a number of the areas delineated on the map.

Results
Further investigations into commercial fungus opportunities on Northern Vancouver Island were done over a 10-day period in October of 2002. The areas surveyed were within TFL 37 (Canfor) and TFL 6 (WFP) and the traditional territories of the 'Namgis, Kwakiutl and Quatsino First Nations. Two researchers surveyed a range of forest ecosystem types in various structural and successional stages. This year we added substantially to our existing database developed over the last 3 years, including new species records and many more sites described. A summary of results to date is as follows:

- 112 sites have been surveyed for fungal species at least once over the past 3 years.
- 74 sites had chanterelles present;
- 30 sites had a relative abundance of chanterelles;
- Approximately 180 fungal species have been identified from the study area;
- 31 known BC commercial fungal species (Berch and Cocksedge 2003) have been identified;
- Ecological characteristics of productive Pacific golden chanterelle and pine mushroom habitat have been described;
- A preliminary model of chanterelle habitat based on Biogeoclimatic Ecosystem Classification (BEC) and forest cover attributes has been developed;
- The study area has been stratified by BEC site series and stand age and structural stage using available ecosystem classifications (Terrestrial Ecosystem Maps (TEM), Lewis Ecosystem classification maps) and forest cover inventory information.

With the addition of data collected this year, we have now identified 189 fungus species or species groups across more than 100 sites on Northern Vancouver Island. Many of these species are valuable NTFP fungus species. We have found the Pacific golden chanterelle (*Cantharellus formosus*) on 74 sites across TFL 6 and TFL 37, 30 of which were considered commercially productive. These sites have been described in terms of general forest cover type and BEC subzone/site series. Sites were predominantly in the CWHxm/01, 05 and CWHvm1/01,05 BEC subzone/variant/site series. Age classes of stands that were sampled ranged from 1 to 9, though most productive chanterelle stands were age class 4. Stands younger than 80 years were established after logging, while those in older age classes are the result of natural disturbance processes. Some of the younger stands had been subjected to various silvicultural treatments such as spacing and thinning during their growth cycle, which will be of interest to forest managers wishing to plan stand tending and silviculture treatments to optimize timber and mushroom production.

Outcomes
The data we collected are being used to develop habitat mapping criteria to map the distribution of productive chanterelle habitat in the study area. Our industry partners can incorporate this information into their inventory databases and use GIS to produce predictive habitat suitability maps for chanterelles. Our First Nations partners from the 'Namgis First Nation, are very interested in building maps from the information we collected to identify mushroom picking opportunities in their traditional territory, which overlaps TFL 37.

Given that 2002 was a poor year for mushrooms in general across B.C. due to an unusually dry summer and fall, we were encouraged by our ability to locate a number of highly productive chanterelle sites this year. Our timing was perfect for conducting field sampling, as the 10 day sampling period coincided with the peak in chanterelle productivity on NVI, as indicated by local mushroom buyers. We were able to predict the location of productive chanterelle habitat using forest cover and ecosystem maps and the habitat criteria developed through this study, though this was not empirically tested. The database we have generated thus far represents some of the most comprehensive inventory data for chanterelle mushrooms in B.C.

Applicability
The habitat information we have collected for chanterelle and other NTFP mushrooms will contribute to enhancing our knowledge and understanding of these valuable fungi. The data will be of interest to forest managers throughout the province and, indeed, across cool temperate regions throughout the world where these fungi are known to occur. Both native and non-native communities on NVI and elsewhere in B.C. will be interested in identifying NTFP mushroom harvesting opportunities as this is another important resource that will enhance economic capacity of forest-based communities.
The information can be used to predict the distribution of productive chanterelle sites within the study area and explore forest management strategies to maintain or enhance chanterelle harvesting opportunities. As well as contributing to a developing NTFP industry, the information collected for this study adds to the state of knowledge of about fungus distributions and habitat preferences in British Columbia.

Contribution to knowledge and recommendations for further research
Prior to this study, there was no information on the distribution and abundance of NTFP mushroom species on NVI by BEC and forest types. Local pickers have a wealth of knowledge and anecdotal information; however, forest managers have not had access to this information in a useable format to include in their operational practices and management planning. Although we have built up a substantial inventory database describing productive chanterelle habitat, it must be realised that we are a long way from developing effective management practices and plans to ensure that chanterelle production is sustained. Mushrooms appear ephemerally on the landscape; we do not have adequate means to accurately predict when and where they will fruit at various spatial scales. We have been challenged with sampling a very large area, usually with only two researchers, and timing that sampling with the fruiting window. Getting the information we collected into operational forest plans will take considerable more effort.

We have recommended that further research focuses on the Pacific golden chanterelle, specifically:

- Use the habitat information we have collected to date to map potential commercially productive chanterelle habitat in TFL 37 and TFL 6 on Northern Vancouver Island and develop a sampling plan to ground-truth these maps;
- Describe in further detail the ecological characteristics of commercially productive Pacific golden chanterelle habitat on Northern Vancouver Island;
- Determine chanterelle productivity in response to historic selective timber harvesting, to the extent that such sites are available;
- Determine chanterelle productivity in response to weather patterns;
- Explore co-management options to sustain the production of chanterelle and timber from the landbase;
- Extension of the results of this project to the forest management, academic research and NTFP harvesting communities.

Operational Variances

Project results exceeded the proposed deliverable. Our inventory approach has become much more refined since we first began our investigations three years ago. This is because we have a better familiarity with the study area, methods, objectives and local mycota. Our approach basically involved two researchers, one focused on identifying as many species as possible, and the other focused on habitat descriptions. This approach enabled us to identify not only NTFP species, but a large number of other species as well. A greater sampling efficiency led to more sites being surveyed in less time than previously. This resulted in a vastly increased fungal species tally this year, with over 150 species identified other than the primary NTFP species we were searching for. These species have been entered into the comprehensive database, linking their occurrence to BEC and forest cover types on NVI.

III.I. Deliverable: *Complete NTFP Certificate Curriculum*

Key Researchers: Darcy Mitchell, Tim Brigham, Kelly Vodden in cooperation with North Island content experts for detailed course development

Activities

The program structure, learning outcomes and basic curriculum for the NTFP Certificate were completed early in the project year and accredited by Royal Roads University in May, 2002.

Results

The NTFP Undergraduate Certificate is the first accredited program of its kind in Canada, and, to our knowledge, the only such program in the North America, Europe and other temperate and boreal regions.

Outcomes

The program will be offered for the first time on Northern Vancouver Island beginning in June, 2003.

Applicability
The program is intended to be flexible and adaptable to local and regional interests and educational requirements. Several post-secondary institutions institutions have requested that Royal Roads partner with them to co-develop and deliver variations on the program. Royal Roads, Malaspina University College and the Nicola Valley Institute of Technology have applied to the Aboriginal Special Projects Fund (Ministry of Advanced Education and Technology) to develop new course materials and to train local subject matter experts over the coming fiscal year.

Contribution to knowledge gaps and recommendations for further research
Development of the program has contributed to our knowledge of learning needs and preferences of adult students in rural communities and particularly of First Nations learners, in the area of non-timber forest products. The structure of the program is innovative and combines applied, practical skills with academic content, and links university faculty with local subject matter experts and experienced entrepreneurs, resource managers, and researchers.

It is recommended that this type of university/community/industry collaborative program development be expanded into other educational areas and that research focus on evaluating such programs and communicating the lessons learned.

Key operational variances
None. However, supplementary activities have enabled the development of the program to proceed well beyond proposed deliverables from the Forest Research Program project.

Supplementary activities

Project team members and additional instructors delivered 4 pilot workshops (floral greens ecology and sustainable harvesting; adding value to floral greens, wild mushroom identification and ecology, and development of a commercial mushroom venture) in the fall of 2002. The workshops were developed and delivered on a 100% cost-recovery basis. Several seats were purchased on behalf of First Nations registrants through the First Nations Forestry Program ('Namgis First Nations on behalf of North Island Nations). The enrolment (15 individuals per workshop on average) was approximately 60% Indigenous and 40% non-Indigenous.

Workshop evaluations were overwhelmingly positive. At least 2 participants ordered commercial wreath and garland making machines and began production in mid-October for the Christmas season.

Under additional funding provided through the Indian Studies Support Program, members of the project team and additional instructors provided training in October and November 2002 in Alert Bay for First Nations instructors. The workshops covered course development and instructional techniques for instructors who will co-teach a number of courses in the Royal Roads University NTFP Certificate Program including the course on NTFPs in interpretation, education and tourism. Eleven content experts attended the workshops, together with four staff members of the 'Namgis First Nation or Winlagalis Treaty Group forestry and NTFP programs. The workshops

were organized by the First Nations NTFP co-ordinator and 'Namgis Forestry Technician and delivered by faculty, staff and contractors of Royal Roads University.

III. J. Deliverable:
NTFP Tourism guide draft complete

Key Researcher: Tim Brigham

Activities and Results
The activity for this deliverable was the creation of a final version of the NTFP tourism guide incorporating changes to the draft manuscript suggested by tourism specialists. Three specialists (see below) were identified and asked to review the manuscript and suggest changes to improve the applicability and over-all usefulness of the guide. These comments were used to create the final version of the guide. Although the publication will be made available as a photocopy in its current form, we hope to publish the guide if funds become available for this purpose.

Outcomes
A revised draft of the tourism guide was created based on comments provided by three expert reviewers of the draft manuscript:

- an Aboriginal tourism business owner from northern Vancouver Island;
- a tourism training expert working with the provincial government; and
- an instructor from Selkirk College specializing in cultural and nature interpretation training.

The final outcome of this project can best be assessed following the offering of the workshop on 'NTFPs: Heritage Interpretation and Tourism' planned for fall, 2003.

Applicability
Given the clearly expressed demand for a guide on this topic (see further information in the next section), we anticipate that the result of this activity will be significant in terms of meeting the needs of end users. The guide was written for tourism practitioners – tour operators, bed and breakfast operators, restaurateurs, nature and culture interpreters, and others – looking for opportunities to expand their tourism businesses with new and innovative offerings. The guide will be used in the NTFP tourism workshops which are planned for the fall of 2003, and it is hoped that resources will be identified to allow for a modest print run of the guide to enable its distribution to a wider audience. The guide will also be made available as resource material for cultural and nature interpretation training being provided through Selkirk College.

Contribution to Knowledge and Recommendations for Further Research
The creation of the NTFP tourism guide is innovative because, to our knowledge, it is the first guide to be produced that addresses the potential of utilizing these products in tourism activities. The guide is a response to the interest expressed by tourism practitioners in learning more about non-timber forest products; in a survey of selected operators on northern Vancouver Island, all expressed an interest in using these products in their tourism offerings, but also expressed concerns about their lack of knowledge, and the lack of skilled interpreters available to utilize

these products. The guide provides a practical foundation for those wishing to pursue the opportunities for utilizing NTFPs in their tourism activities.

A key area for further research would involve an assessment of how First Nation-run tourism operations have been able to utilize these products in their activities. There is tremendous potential for First Nation NTFP tourism; how effective have Aboriginal-owned tourism businesses been at incorporating NTFPs into their activities? Are there specific resources they require to be able to use these products as part of their tourism offerings? If so, what are these resources?

Operational Variances
None

III.K. Deliverable: ***Evaluate business mentoring***

Key Researchers: Ramsay Farran, Wendy Cocksedge, Diane Carley

Activities
Business mentoring to entrepreneurs interested in starting up or expanding in the area of NTFP's was provided:

Mentoring was conducted on a one on one basis and took the form of responding to research requests, suggesting linkages, avenues of opportunity, introductions to other entrepreneurs who have achieved success in the field of NTFP's, and general business advice.

In addition to direct mentoring activities, the draft pickers handbook was reviewed for industry and market information Also, web research was conducted on floral ferns, salal, wreaths and food ferns, export regulations, transportation options to assist in the determination of markets, prices and economic viability. Export trade marketing programs were also researched at the request of a client

Results
While it was expected initially that mentoring would be provided on an as requested basis, it was (as in previous years) found that a more direct proactive approach to selected individuals and groups interested in the general area produced a better response:

This approach took the form of a presentation on NTFP entrepreneurship and the offering of mentoring assistance at two North Island NTFP workshops and at a NTFP entrepreneurs roundtable. Individuals who were known to be active in the area of NTFPs were contacted and asked if assistance could be provided. Local entrepreneurs were approached and advised of opportunities that existed for diversification of their businesses.

The roundtable was organized by the lead researcher in response to demand from the community for a need to learn directly from a person who had been long established in the wholesale end of the business. While it resulted in some of those attending to decide that they did not wish to become involved as buyers it also enabled others to see benefits and opportunities in this field of

activity. Those expressing an interest were later approached with offers of assistance from the mentor.

New opportunities and ways to cooperate directly led to the mentor advising on such issues as the names and contact information for mainland and Vancouver Island buyers, backhaul opportunities, markets and product standards.

Outcomes
Direct mentoring of a (new) mushroom buyer led to an expansion of his operation.

Discussions were held with local FN band personnel on various options that could be considered for the band to establish an economic presence in the area of NTFP's. Assistance was given on the trial manufacturing and marketing of product.

One salal harvester was advised on how to establish a backhaul of his product into mainland markets thereby substantially increasing the viability of his operation.

Two wild floral harvesters were introduced to mainland buyers of their product.

At the request of an individual interested in entering this market research was conducted on the viability of establishing a cedar bough harvesting operation on the North Island.

Assistance was given to an individual who wished to explore how to establish a mushroom buying station.

Substantial effort was directed towards the establishment of a NTFP harvest and processing company. Assistance with the production of a business plan was given. An alliance was forged between a harvester and local business person to locate an operation in Port McNeill.

In total 11 individuals were mentored. It is estimated that between 10 to 20 part time jobs were created as a result of increased NI activity in the harvest and processing of NTFP's. We also expect that this total will substantially increase in the year 2003 if all activities that were commenced during the period of research pan out as anticipated.

Applicability, Contribution to knowledge gap and recommendations for further research
The results of this sub-project are likely relevant to any community struggling to diversity and stabilize an economy that has been based on conventional resource extraction. Results provide evidence that the adoption of a more entrepreneurial, niche-based economy is a long, slow process and that supporting the creation of new industries involves more than "awareness building". Economic development activities that emphasize short term job creation should be replaced or supplemented by efforts to enhance, stimulate or, where necessary import, management and entrepreneurial expertise and private investment. More research is required in the areas of innovation diffusion, technology transfer, and entrepreneurship to achieve a better understanding of how change can be supported and to delineate the appropriate spheres of private risk-taking and public investment.

IV. Supplementary Activities

A. Extension and Communications

In addition to the project newsletter and website, team members have given presentations in Port Alberni to a public meeting of the West Island Woodlands Advisory Group (Ramsay Farran and Darcy Mitchell) and in Prince George (Wendy Cocksedge) to the Aboriginal Agriculture Association. Darcy Mitchell, Harry Alfred and Melvin Hanuse addressed a conference on Economic Development organized by the Secwepemc Nation Tribal Council and the Secwepemc Natural Resources Board in Kamloops in late November. A paper and posters about the project were presented at the IUFRO All Division 5 conference in New Zealand in March, 2003.

During year, several newspaper articles about the North Island project appeared in the local press, including a front page story in the North Islander (serving the mid-Island north). Darcy Mitchell and Wendy Cocksedge were interviewed by CBC Radio Victoria in March, 2003. Interviews for a feature story in the Victoria Times-Colonist have been completed; the story is expected to be published in late April or early May, 2003.

B. Master's Thesis, Tracy James, Masters in Environment and Management, Royal Roads University

Two of the project team members are co-supervising the following master's research, which incorporates a case study of the North Island NTFP Demonstration Project and associated activities.

Abstract: Knowledge networks for sustainable community development: enhancing rural innovation

The objective of this research is to advance understanding of the contribution that collaborative multi-partner economic diversification projects in rural communities can make to sustainable (community) development. The research focuses on the development and management of knowledge networks and 'communities of practice' as a way of enhancing the community's innovation capacity and building social capital for sustainable community development. The research involves a case study of one innovative economic diversification initiative, the Non Timber Forest Products (NTFP) Demonstration Project, based in the Mount Waddington Regional District of northern Vancouver Island.

Through an extensive literature review, the study will determine conceptual linkages in the literature and the practical application in the case study area. Case study research takes an action-research approach that includes a review of key documents in the NTFP and CCLRMP process, and interviews with key partners in the Non Timber Forest Products Demonstration project and the newly formed steering committee of the Centre for Non Timber Resources.

The goal of this research is to provide project leaders (current and future) with recommendations on how to encourage and manage knowledge networks and communities of practice, in order to move innovative projects and sustainable development initiatives forward. The study will also

identify further opportunities for research on the relationship between knowledge networks and rural innovation.

C. Planning processes for a Centre for Non-Timber Resources (Royal Roads University) and a North Island NTFP Innovation Centre

With assistance from Western Economic Diversification (WED) and Human Resources Development Canada (HRDC), steps are being taken to create an applied regional NTFP Innovation Centre to serve the North Island region linked with, but organizationally separate from, a Centre for Non-Timber Resources (CNTR) at Royal Roads University. Planning for the CNTR project is also assisted by WED. The planning process for the North Island Centre is being coordinated by the Community Futures Development Corporation of Mt. Waddington.

North Island NTFP Innovation Centre

The Innovation Centre business plan has been developed in consultation with the Demonstration Project partners, together with local NTFP harvesters and entrepreneurs, local municipalities and interested members of the public.

The mandate proposed for the North Island NTFP Innovation Centre includes business development, applied research and information management, training and education, community development and provision of a discussion and consultation forum for NTFP issues, and coordination of First Nations' interests

Centre for Non-Timber Resources, Royal Roads University

The purpose of the Centre for Non-Timber Resources is to support and encourage sustainable utilization of non-timber forest resources in the temperate and boreal regions of the world. "Sustainable utilization" refers to the protection and enhancement of subsistence, cultural, recreational and commercial uses, as well as the protection of ecosystem values. The principal focus of the Centre is the wise use of non-timber forest resources to diversify and sustain rural and resource-dependent economies.

The Centre will concentrate initially on botanical and mycological resources (other than timber), generally known as "non-timber forest products".

The Centre will accomplish its purpose by:

1. Supporting primary and applied research that is directed to all aspects of sustainable utilization of non-timber resources, particularly research that is directed to linking, integrating and applying research results from multiple disciplines and research methodologies;
2. Developing, delivering and fostering the delivery of educational and training programs at the community, industry, undergraduate and graduate levels and by encouraging the development of non-timber resource curriculum in the K-12 system;

3. Supporting the application and extension of research in all areas of Non-timber resource utilization, including commercial, subsistence, recreational and traditional uses;
4. Contributing to the development of policies and institutional arrangements that promote the sustainable utilization of non-timber forest resources; and
5. Liaising with and supporting all sectors and communities concerned with the sustainable utilization of non-timber resources including Indigenous peoples and communities, other rural and resource-dependent communities, other research and educational institutions, industries and their organizations, the public sector, and non-governmental organizations.

National and International Linkages

In developing the Centre for Non-Timber Resources concept, Royal Roads University is working toward linkages with national and international researchers and organizations, including the Non-Wood Program of the Food and Agriculture Organization and more specifically the North American Forestry Commission (the project leader is a member of the Non-Wood Sub-Committee); the International Union of Forest Research Organizations, the Council for International Forest Research, United States researchers and managers at the Federal and State levels as well as academic researchers, colleagues in Europe, Asia and Mexico, and Canadian researchers and organizations across the country including the Northern Forest Diversification Centre, ULEARN (Algoma University), the National Aboriginal Forestry Association and the Sustainable Forest Management Network.

V. Conclusions

Experience with the North Island Integrated Project has confirmed the need for support to be paid simultaneously to the ecological, economic and social aspects of sustainable development of NTFPs.

Lessons from previous projects in the region and from the current project include the following:

- local applied projects cannot flourish without specialized expertise and research support and without appropriate policy and industrial infrastructure that can only be implemented at the provincial or national level, or both;
- Provincial, federal or international research centres or agencies cannot be effective without the efficient extension, practical application, and "buy in" possible only through local projects that are genuinely supported and implemented by local communities; and
- regional strategies, linking rural production and urban and international markets, are essential for efficient coordination of local, provincial and national initiatives.

Short term, single-focus projects create little or no enduring expertise or commitment to the complex task of building a sustainable economic sector while protecting non-commercial resource use. To achieve these results it is necessary to build capacity that is of the correct *scale* and the correct *scope* at regional, provincial, national and international levels. At each level,

organizations must be both independent and integrated. To create such a network is an institutional design problem of imposing dimensions.

Recommendations for Further Research and Development
Recommendations for further research have been noted throughout this report. What is required at this point in the evolution of Non-Timber Forest Products as a renewable, sustainable resource sector in British Columbia are:

1. **comprehensive, integrated agendas for research, extension, education and training, capacity building and development of all NTFP sectors; and**
2. **Institutional capacity to create and implement such agendas.**

The Centre for Non-Timber Resources at Royal Roads University and the North Island NTFP Innovation Centre are proposed as essential steps toward these ends.

VI. Acknowledgements

The Project Team thank Dr. Ron Bordessa, Vice-President Learning and Dr. Richard Skinner, President for their support and assistance in this project and in the further development of NTFP initiatives at Royal Roads University.

Royal Roads University and the Project Team gratefully acknowledge the enthusiastic support and collaboration of the following project partners:

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Ed Jackson, Winalagalis Treaty Group
Christine Joseph (Wata) and Chief Alex Wilson, Kwakiutl First Nation
Ted Stevens, Gwa'sala-'Nakwaxda'xw First Nation
Ralph Wallas, Quatsino First Nation
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Dave Mogenson and Mike Desrochers, Western Forest Products
J. Smith, B.C. Institute of Technology
Stacy Cuzzocrea and Dr. Peter Kofoed, Weyerhaeuser Canada
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APPENDIX A

PROJECT NEWSLETTERS

APPENDIX B

Project Report – R02-0178 – NTFP Management Pilot Project Design
Forest Innovation Investment: Research Program 2002/03: Final Report

Project title:

Non-timber forest products pilot project: design phase. Ref. No.: R02-0178.

Project leader:

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Abstract:

The purpose of this project is to design the Non-Timber Forest Product Collaborative Stewardship Project (NTFP CSP), whose goal is to overcome uncertainties in the management and stewardship of non-timber forest products, thereby leading to an appropriate NTFP management regime for the province of British Columbia. The project if implemented would test a variety of management assumptions in a pilot setting. What is meant by stewardship and management of the resource is to recognize the contribution of NTFPs to regional economies and the hundreds and thousands of individuals who rely on NTFPs for all or part of their livelihoods, whether monetary or subsistence based. This project is meant to provide a means to both enhance NTFP opportunities and ensure the use of appropriate harvest methods in the extraction of a sustainable volume of product. Thus, the focus is avoiding value led over-exploitation of the resource and a threat to the long-term stability of commercial and non-commercial uses. The pilot approach is important to deal with management uncertainties and product characteristics. Prior to implementing the pilot, the design must get Ministry of Forests executive and government approval, as such the design of the pilot and its potential implementation is still in its early stages.

Keywords:

non-timber forest products, property-rights, sustainable forest management, common pool resources.

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1. Summary of activities, results, and outputs:

The project was tasked to "prepare a detailed pilot program to test management options for non-timber forest products." The purpose of the pilot project itself is "to test and evaluate a variety of approaches to managing the commercial harvest of NTFPs." The pilot is intended to "provide forest districts with a set of management tools to more effectively manage NTFPs, enhance the value British Columbian's accrue from the forest, and contribute to sustainable management of forest resources." Three forest districts have been identified as *potential* pilot candidate areas: Port McNeill, Squamish and Chilliwack.

The pilot project design included the following activities:

- Establishment of a design team to assist in the development of the pilot. The design team participated in design meetings, provided notes, thoughts and ideas regarding the design of an NTFP management regime, reviewed and commented on drafts, and helped to communicate the project to local communities and the NTFP industry.

- Design team meetings: three design team meetings were held, one in Victoria and one each in Port McNeill and Chilliwack. These meetings were intended to first, introduce the project and various NTFP management characteristics to the design team, and second to gather and assess information from stakeholders in each pilot district. Separate design meetings were held in the Squamish forest district with local industry participants.

- Continued review of the literature on managing common pool resources and common property approaches to management. The review was a continuation in the review of literature undertaken for the FRBC project "Property rights in the sustainable management of non-timber forest products."

- Washington State visit: A trip to Washington State took place in late March to meet with members of the NW Research and Harvesters Association. The Association, in conjunction with the Department of Natural Resources and Washington State University, have leased state land on which management trials are underway. Members of the design team travelled to Olympia and Shelton WA to meet with Association members. A site visit was also made to Hiawatha Corp. which is one of the largest NTFP wholesaler in Western U.S. and Canada.

- Meetings with representatives from wild mushroom buyers and floral greens industry were held at two separate occasions in order to inform the industry of the project and to solicit their input regarding the management of NTFPs.

- Preparation of a final report, design team and stakeholder review. A substantial amount of time went into the preparation of the final report and communication of the results in an accessible form.

The results from these activities include a detailed list of NTFP industry participants who will be instrumental in the successful implementation of the pilot. The meetings and literature review

provided a vast amount of information related to the characteristics and types of approaches having potential management efficacy. In addition, the information was instrumental in developing the overall concept for an NTFP management pilot project and eventual provincial regime.

The final output of these activities and work is a report outlining a proposed policy direction for managing NTFPs and a pilot project design that will inform and guide management direction. The report, titled the "Non-timber forest product: collaborative stewardship project" will be released to the public for comment for the continued development and refinement of the pilot project.

2. Evaluation of project outcomes:

The specific deliverables outlined in the proposal include the following:

1. A selection of management regimes for NTFPs;
2. An adaptive management design to monitor, evaluate and adapt management regimes;
3. An implementation strategy to launch the NTFP pilot;
4. A set of policy and/or legislative prescriptions; and
5. A written report providing a detailed description of numbers 1-5 above.

The two components not fully completed (discussed below) include the adaptive management plan and the implementation strategy.

A policy paper was produced, however, that outlines a detailed policy prescription for a pilot project and several approaches to managing NTFPs. This paper provides an extensive description of the conceptual design of a management regime and the relationships that would be established. The report also provides a detailed description of the pilot approaches and an evaluation of the conceptual design, vis-à-vis a literature review. The adaptive management plan, while not fully complete, does outline a set of attributes and indicators that will become a central component of the monitoring, evaluation and adaptation of the pilot approaches.

3. Assessment of applicability:

The results of the project are immediately applicable to develop an implementation plan for the pilot project. The results of this project have identified the conceptual or institutional basis for the pilot and NTFP management, the individual management or pilot tests, the reporting and relationship structure between the management and industry participants, and a revenue mechanism for the collection of resource rents.

4. Contribution to knowledge gaps and areas of further research:

In British Columbia, the NTFP resource is currently an unmanaged open access resource. There is very little information about how to incorporate NTFP into a management regime that will both deal with the characteristics of NTFPs and the management difficulties experienced in other

jurisdictions. In addition, incorporating NTFPs into forest management (timber, NTFPs, and other values) is not well understood and could become better informed through the pilot.

The pilot if implemented will provide the stage to test a variety of assumptions regarding the management of NTFP in British Columbia. Through results this testing, a provincial management regime can be developed.

The pilot will open several areas for further research. These are related to the pilot monitoring and adaptive management framework built into pilot program. Areas of research include monitoring compliance, evaluation of sustainable harvest practices, inventory, growth assessment and sustainable rates of harvest, effects on investment, business development, volumes and values, management of forests for multiple values, and a range of other efforts to monitor the outcome of the various management approaches on industry participants.

At the end of the pilot term, a substantial amount of research data will be available to present a significant case study.

5. Key operational variances:

The most significant operational variance was the reduced time frame to complete the project. This resulted in a number of process difficulties and a reduced number of deliverables.

The project established a design team made-up of NTFP industry participants, government, forest industry, First Nations and university representatives. A goal of the project was to have open, consistent and timely communications with this design team. Due to the condensed timelines, one of the first components to be affected was this consistent and timely communication with the design team, specifically related to the extension of meeting notes and other information regarding the design's development.

The original plan included the completion of an implementation plan and adaptive management plan that would outline the stages necessary to initiate the pilot, the finer details regarding how the pilot's administration would fit into existing processes, and the monitoring process necessary for the pilot's evaluation. The full implementation plan was not completed, although the initial stages of the adaptive management design were completed.