PROJECT REPORT

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FINAL PROJECT REPORT

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Final NTFP Commercialization Report

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Final NTFP Commercialization Report

SFMN Project: Commercial development of non-timber forest products and forest bio-products: critical factors for success

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ABSTRACT

Non-timber forest products (NTFPS) and forest bio-products have been increasingly recognized globally as important for supporting the livelihoods of forest dependent people, fostering natural resource conservation and providing ecosystem services. In the face of challenges including the Mountain Pine Beetle epidemic in B.C., ecological issues such as climate change and economic pressures due to changing global competitiveness, the possibility for NTFP development may be beneficial for forest dependent communities to diversity their economies and soften the impacts of the current challenges affecting the forestry sector and for the forest sector more generally to produce a more compatible combination of commercial products and non-market products and services. This report will highlight the development of 10 full case studies and two NTFP profiles using an adapted 'production-to-consumption' approach that focuses NTFP development within a sustainable forest management context. Four general forest management scenarios are outlined and used to discuss the potential for incorporating NTFPs within forest management. Many NTFPs have potential for generating wages comparable with other employment available in resource dependent communities, as well as processing, marketing and other employment in peri-urban and urban communities. Expanded production of NTFPs can be achieved through compatible forest management with timber in extensive management settings and also within agroforestry systems. Some NTFPs may also evolve into cultivated crops due to economic efficiencies. Under current government policies within most jurisdictions, there are very few specific policies that regulate NTFP harvesting, processing and marketing/exporting. Generally, a lack of property rights pose significant barriers and disincentives for commercial NTFP management and investment. A finding which may distinguish the value of NTFPs in 'northern' (developed) versus 'southern' (developing) regions is the significant importance attached by many users to traditional, cultural, recreational and other non-market uses of these species, uses which in some cases may be more significant than the value of commercial production.

Keywords: Non-timber forest products, Aboriginal communities, bio-products, Canada Yew, floral greens, medicinal products, essential oils, tree syrups, forest policy, forest tenure, forest management, wild berries, wild mushrooms.

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RESEARCH QUESTIONS AND OBJECTIVES

Original Questions

- What is an appropriate methodology for analyzing the factors that influence successful commercial development of NTFPs and bio-products by Aboriginal and other rural communities in Canada and the benefits – and costs – of commercial development?
- What are the critical factors for success?
- Based on the results of this analysis, what are some key measure measures, including potential changes to institutions, by which NTFPs and bio-products can contribute more effectively to economic diversification and development of Aboriginal and other rural and resource-dependent communities in Canada and avoid or mitigate negative impacts of commercial development on subsistence, traditional and recreational values of non-timber forest products?.

Original Objectives

- Through original case study research, to document the production to consumption system for 8-10 important NTFPs or bio-products, including both commercial and non-commercial (e.g. subsistence and cultural uses, and retention of species to support wildlife) uses of the product where relevant and including documentation of social, economic, cultural, biophysical, and institutional characteristics of each case;
- To develop a policy framework for NTFP/bio-product management, processing and marketing in target jurisdictions (B.C., Ontario, and New Brunswick) with documentation of other Canadian jurisdictions if resources are sufficient.
- To adapt and extend as necessary the analytical framework created by CIFOR to Canadian and other North American cases of commercial development of NTFP/bio-products and produce a "rolling" series of working papers that document and evaluate critical factors in "success";
- To develop recommendations for relevant decision-makers as to whether and how to implement or accelerate the commercial development of specific NTFPs or bio-products, or NTFP or bio-product sectors, including recommendations for appropriate tenure and property rights systems – for both tangible and intangible (intellectual) property;
- To create a searchable database of documented NTFP/bio-product development cases with the intention that this database will be permanently maintained and enhanced; and
- To reach some provisional conclusions about similarities and differences in NTFP/bio-product development in the "North" and the "South", thereby contributing to a broader global understanding of the sector.

The original objective of developing 8-10 case studies was met as 10 full case studies (9 complete and 1 'in-prep') that have been written and 2 additional 'limited case studies' (1 complete and 1 'in-prep') written. The difference between the full and limited case studies was that for the limited cases, there was no harvester or processor survey data collected.

As this project developed and the research team was built, there was recognition that the scope of the project needed some refining and re-focussing. The team decided to focus on NTFPs in Canada and did not conduct case studies of "bioproducts", (such as bio-energy) nor of other North American jurisdictions.

Some of the higher level analytical objectives of the project were reduced in scope, largely because of the significant challenges in developing the cases, including. language barriers (in the case of immigrant harvesters) and extended requirements for dialogue with First Nations dialogue whose concerns about NTFP "commercialization" limited or excluded the involvement of First Nations in some cases, and took added resources in others. Further, as the project team consisted mainly of individuals within the natural resource sciences disciplines, this influenced the cases to be more weighted toward forest management and ecological issues that influenced "success". Another change of action as the project evolved was the reality that a broad 'policy framework' approach may be injurious to oversimplifying NTFP policy development and therefore the team began to explore adaptive management approaches to foster policy development. This approach is discussed below. Lastly, as noted below, the 'north south' comparison aspects of the project will be explored more fully through two new projects discussed under 'new research'.

KEY FINDINGS

What defines "successful commercialization"?

Results from the project suggest that definitions "success" should include, not only the viability of individual enterprises and broader NTFP sectors, but also include recreational and traditional NTFP harvesters who live in forest communities who are healthier because they harvest NTFPs (are active physically) and eat a healthier diet. As some recreational and traditional NTFP harvesters no longer harvest for subsistence purposes (as most people have higher disposable incomes), their choice for harvesting NTFPs and their use (while reducing their annual food budgets) may be motivated by other objectives. These objective include: minimizing climate change impacts caused by transporting food imports long distances; and, First Nations traditional uses, which are being shown to mitigate health issues such as diabetes. Therefore, within our understanding of "success", successful NTFP commercialization should promote a 'triple bottom line', by supporting rural livelihoods (economic), fostering healthy lifestyles and socially rewarding activity (social), and minimizing impacts upon the environment (environmental). These findings are consistent, especially in respect to social objectives, with those of authors such as (Marshall et al. 2006).

NTFP Production – General issues

- Currently NTFPs are mostly 'wild-harvested', which poses significant challenges for business development as supply issues make year-to-year decision making difficult. This is particularly true for wild harvested mushrooms and berries;

- Habitat losses for NTFP production are occurring in some cases as a result of forest management practices e.g. silvicultural prescriptions and wildfire suppression, which makes commercial development challenging; and
- There is greater demand than available supply for some NTFPs, which may lead to significant sustainability issues under 'open access' regimes.

Ecology/Forest Management

- There is limited knowledge of the ecology of most NTFPs;
- Mapping suitable habitat for production is needed for most NTFPs;
- Predicting NTFP production levels for potential harvesting is difficult, especially for wild mushrooms and berries and, even where prediction is possible, production volumes do not equate to volumes of market quality NTFPs;
- There are many possibilities for compatible 'joint' management of timber and NTFPs that need more exploration and extension within the community of forest professionals;
- Some NTFPs (wild blueberries, maple syrup, salal) have successfully developed cultural practices that enhance production, and more production research is needed;
- NTFPs are consistent with and assist forest managers in meeting sustainable forest management objectives; and
- Emerging values for environmental services may create more incentive for NTFP management within forestry.

Socio-economics

- Many NTFPs are support sustainable livelihoods for rural community peoples across Canada and will become even more significant as the traditional forest economy shifts in the future with reduced levels of timber production;
- NTFPs are harvested in many cases by not only the disadvantaged or poor, but by well educated and individuals with adequate capital for business development;
- Many NTFPs have comparable wages with the other employment opportunities in rural communities and could be attractive to labor as the traditional forestry sector is stressed and job losses continue; and
- There are very few barriers for entry for NTFP harvesters and may be a relatively easy shift for many to enter the NTFP sector. This situation may also, however, lead to over harvesting, lack of industry stability, conflict between user groups and other effects of 'open access' as noted below.

Institutions and Industry

- Strong producer and processor organizations are essential for promoting NTFPs as these provide networking, applied research, marketing and advocacy for policy development;
- Producer organizations may have the potential to increase bargaining power for harvesters who are typically price takers in the marketplace; and

- Cooperative transportation, marketing, branding and processing may foster greater viability for NTFP producers.

Policy

- Well defined property rights are essential, but not sufficient, for NTFP commercial investment;
    - Exploring policy alternatives to grant property rights for NTFP producers needs to be considered for many various regimes e.g. Crown Lands;
- A lack of property rights and 'open access' conditions potentially leads to conflicts between commercial, recreational and traditional users and could be mitigated with assigning appropriate rights;
- There is a current lack of NTFP management required within forest management which limits the potential for NTFP production;
- There are current taxation issues that create disincentives for NTFP producers; and
- NTFPs do not have a 'home' within any provincial or federal ministry or department; the lack of a policy community or advocates for NTFPs limits their ability to achieve a place on policy agendas.

Marketing and Trade

- Many NTFPs have global markets and have significant growth opportunities for the future;
- NTFPs markets are growing in light of increased interest in 'wild foods', 'locally produced' and the associated health benefits of these products.

External Support

- A strong research infrastructure is essential to exploring the opportunities for greater NTFP production within extensive forest management, agroforestry and cultivation scenarios;
- Research and development funding have been more abundant for NTFPs with secure property rights than NTFPs under 'open access' conditions; and
- Strong marketing and trade support is essential to developing markets and promoting trade opportunities.

KEY DELIVERABLES

The project allowed many opportunities for knowledge exchange and will continue to benefit the research, industry, First Nations and provincial and Federal government communities: Over the last 3 years the researchers have contributed the following:

Conference Presentations

Mitchell, Darcy and Tom Hobby. North American Agroforestry Conference, Quebec City, June 10-12, 2007. "*Non-timber Forest Products and Forest Farming: A usage continuum".*

Hobby, Tom**.** The Big Huckleberry Summit. University of Washington. June 21-22, 2007. *A Black Huckleberry Case Study in the Kootenays Region of British Columbia.*

Mitchell, Darcy**.** National Forestry Congress, Ottawa, September 26, 2006 *"Safety Net, Springboard, Social Capital: Non-Timber Forest Products and Boreal Forest Communities".*

Hobby, Tom, D. Mitchell, T. Brigham, S. Robertson, E. Ramlal, D. Buck, E. Hamilton
Sustainable Forest Management Network, Conference, Edmonton, AB, June 24-26, 2006. "Canadian Non-Timber Forest Products: *Strategies for Sustainable Management, Community Development and Policy Implementation"*. Discussion Forum.

Hobby, Tom, K. Dow, S. MacKenzie. Sustainable Forest Management Network, Conference, Edmonton, AB, June 24-26, 2006. Poster. *"A salal (Gaultheria shallon) Case Study on South Vancouver Island British Columbia Using an Adapted Centre for International Forestry Production-to-Consumption Approach".*

Mitchell, Darcy. B. Mainprize**,** T. Hobby IUFRO World Congress, Forests in the Balance: Linking Tradition and Technology, Brisbane, Queensland, Australia, August 8-11, 2005. *"Non-Timber Forest Products and Indigenous Enterprise: Prospects for Income, Conservation and Community Wellbeing".*

Hobby, Tom. Western Forest Economist Annual Meeting, *"Economic Values of British Columbia NTFPs"*. Wemme, Oregon. May 1-2, 2006.

Keefer, Michael. *"The Ecology and Economy of Morels in BC's East Kootenay"*
A Future Beneath the Trees, International NTFP Symposium. Royal Roads University, August 25-27, 2005.

Hobby, Tom. *"Developing a Case Study Database for NTFPs in North America Using an Adapted CIFOR Framework"*

A Future Beneath the Trees, International NTFP Symposium. Royal Roads University, August 25-27, 2005.

Robertson, Susan. *"The Economic Potential of Taxus Canadensis Plantations in Northern Ontario"*

A Future Beneath the Trees, International NTFP Symposium. Royal Roads University, August 25-27, 2005.

Workshop Presentations

Hobby, Tom. "*NTFPs in the East Kootenays"*. December 12, 2006. Non-Timber Forest Products Workshop. Natural Resources Canada, Pacific Forestry Centre, Victoria, BC

Keefer, Michael. -Presenter. "*The Ecology and Economics of Morels in the East Kootenays"*. Kootenays Forest Innovation Society Workshop, College of the Rockies, Cranbrook B.C. September 16, 2005.

Mitchell, Darcy. Presenter. *"Non-timber forest products: markets and management"*. North Island Woodlot Owners. Quadra Island, B.C. April 6, 2006,

Hobby, Tom. Presenter. *"NTFPs in British Columbia, A World Beneath the Trees"*. Kootenays Forest Innovation Society Keynote Address, Selkirk College, Nelson, B.C., October 14, 2005.

Hobby, Tom *"NTFPs and Community Economic Development"*. Kootenays Forest Innovation Society Workshop Presenter. October 15, 2005. Selkirk College, Nelson, B.C.,

Hobby, Tom. *"NTFPs and Community Economic Development"*. Kootenays Forest Innovation Society Workshop, September 16, 2005 College of the Rockies, Cranbrook B.C. .

Book Chapters

Mitchell, D., S. Tedder, T. Brigham, E. Hamilton, W. Cocksedge, T. Hobby, and S. Berch. Policy Gaps and Invisible Elbows: Non-timber Forest Products in Canada. Invited chapter for People and Plants International forthcoming book Non-Timber Forest Products Policy: frameworks for the management, trade and use of NTFPs. Submitted July 2007

Chamberlain, J., D. Mitchell, L. Zabek. J. Davis, T. Brigham, and T. Hobby. Forest Farming Practices in North America. Invited chapter for North American Agroforestry: An Integrated Science and Practice. Second edition. Submitted July 2007.

Journal Articles

The following articles comprise a special issue of the B.C. Journal of Ecosystems and Management to be published in April 2008.

Mitchell, D., T. Hobby 2007 (in-prep). "*From rotations to revolutions: non-timber forest products and the new world of forest management"*. B.C. Journal of Ecosystems and Management.

Keefer, M., Winder, R. Hobby, T. 2007 (in-prep). *"Commercial Development Morels in the East Kootenay, British Columbia"*. B.C. Journal of Ecosystems and Management.

Hobby, T., Mackenzie, S., Dow, K. 2007 (in-prep) *"Commercial Development of Salal on South Vancouver Island"*. B.C. Journal of Ecosystems and Management.

Ehlers, T. 2007 (in-prep) "*Chanterelle Mushrooms on Vancouver Island, British Columbia"*. B.C. Journal of Ecosystems and Management.

Hobby, T., M. Keefer.2007 (in-prep)"*A Black Huckleberry Case Study in the Kootenays Region of British Columbia"*. B.C. Journal of Ecosystems and Management.

Hobby, T., K. Maher, E. Keller.2007 (in-prep)"*Commercial Development Bigleaf Maple Sap Harvest on Vancouver Island"*. B.C. Journal of Ecosystems and Management.

Masters Theses

Author: **Michael Keefer**
Date on thesis (month/year): January 2005
Thesis title: The Ecology and Economy of Morels in British Columbia's East Kootenay
Department: Environmental Management
Academic institution: Royal Roads University
Degree: MA
Supervisor(s): Darcy Mitchell, Richard Winder

Author: **Susan Robertson**
Date on thesis (month/year): June 2005
Thesis title: *The Economic Potential of Taxus Canadensis Plantations in Northern Ontario*
Department: Economics
Academic institution: University of Guelph
Degree: MA
Supervisor(s): Glenn Fox

Case Studies – Website and Database

Nine case studies and one NTFP profile were completed and can be accessed at www. Royalroads.ca. Five of these case studies are pending publication and therefore the abstracts are only shown until these are published. In addition, as part of the project, a searchable database with the main descriptor variables is also available at the CNTR website. This is a searchable database for specific NTFPs based on a 'production to consumption' approach that consists of 118 variables that were attempted to be collected for each case. There is also included, the data collection survey instruments that were used and summary statistics for these NTFP harvester/buyer surveys for several cases.

Other Resources

Compendium of NTFP law and policy in all Canadian jurisdictions (65 individual reports). Developed jointly through this project and a 3 year project supported by the Canadian Model Forest Network. Available at http://www.royalroads.ca/programs/faculties-schools-centres/non-timber-resources/cntr-law-and-policy-papers.htm

An article outlining the economic development findings from this project is in development, to be submitted to the Journal of Rural Studies or other appropriate journal by early 2008.

BENEFITS TO PROJECT PARTNERS AND OTHERS

This project has assisted NTFP producers and processors, First Nations, and forest companies, in gaining a better understanding of the needs and gaps pertaining to the incorporation of NTFPs within forest management, and NTFP commercial, recreational and traditional use development. Government has been made more aware of the policy issues that are hindering the promotion of the sector and new initiatives have been started within government (such as the changing of the harmonized trade codes) for gaining a better understanding of the value and benefits of the NTFPs sector.

In addition, the academic community has been able to benefit through many conference presentations and panels and the publications written as part of this project will assist the research community to be more aware of the opportunities and challenges that the NTFP sector faces. This project will serve as a catalyst for new research initiatives to be developed that extend this research and focus on the specific issues that have been raised.

MANAGEMENT/POLICY IMPLICATIONS

Management and policy implications of this project fall into a number of areas, including forest management, community economic development, and First Nations policy. The primary emphasis in this report and in the major extension project (special issue of JEMS) is the potential of NTFPs to contribute to sustainable forest management, under four general management scenarios, the first three of which are currently evident in various regions of British Columbia:

1. Traditional forest management–principal focus is traditional forest commodities with no defined property rights for NTFPs;
2. "Special management scenarios"–situations in which timber production is significantly constrained by environmental, social, or other factors, which are enforced through regulatory or other means; there are generally no specific property rights or regulatory regimes for NTFPs
3. "NTFP management or rights" - situations in which forest owners or managers have customary, practical or legal property rights to non-timber forest products; and
4. "Management for emerging values" - situations in which there is focus on emerging values, e.g. carbon credits, payment for environmental services.

Scenario 1: traditional forest management

Many commercially harvested NTFPs are commodities that are not on the radar screen of traditional forest companies. Most of these companies operate on Crown lands where most of the provincial forested regions are found. NTFPs on Crowns lands are mostly unregulated under the current laws. NTFPs of many different types are currently harvested under this traditional forest management scenario. For example, salal, huckleberries, and all the wild mushrooms are NTFPS that are harvested on crown lands in the absence of defined property rights, and are generally not being managed by forest companies.

In this scenario, there is no way to protect the investment of any entity or individual that attempts to manage NTFPs, and therefore, on most Crown lands, there are only extractive NTFP harvesting enterprises. With current forest management practices, there is significant risk for NTFP habitat reduction in these forest areas and they may be unable to sustain the production of NTFPs in the future. For example, the B.C. Ministry of Forests and Range (MOFR) under the Forest and Range Practices Act (FRPA) do currently not manage the black huckleberry, and there is evidence that current fire suppression and silvicultural practices, which are managed by the MOFR, may be limiting NTFP abundance. This in turn reduces the resources once available for both harvesters and wildlife.

A serious constraint on ameliorating this situation is that even those timber companies that may be interested in meeting broad SFM objectives would face unrecoverable costs if they limited timber production in the interests of sustaining NTFP production. In addition, under the current tenure systems, there is no mechanism by which timber companies may be compensated for providing NTFP harvesters access to the resources. Timber licensees have not been assigned property rights, which would allow them to sell permits to interested harvesters for these resources. In short, a number of disincentives are in place for successful and sustainable commercialization of NTFPs under the traditional management scenario that is in effect on most of the land base in the province. Harvesters under this scenario have an incentive to pick as much of the resource as they can for fear that someone else will take any product they leave behind. This may result in over-harvesting and unsustainable practices with regard to NTFPs, and may also contribute to damage to timber and to forest ecosystems (Tedder *et al.* 2002).

Scenario 2: special management situations

This scenario applies when certain environmental, social, and traditional use objectives and values may be already established that support NTFP development even though property rights are not legally defined or assigned. In this case, there is also the lack of a rights framework, which brings with it certain disincentives and barriers, but NTFP production is seen to be compatible with various ecological objectives. For example, the morel mushroom harvest may be enhanced in specific areas as other key ecosystem restoration (ER) objectives are met through thinning and prescribed burning. Huckleberries may also have ER compatibility as they are valuable in the sustenance of wildlife, and sustaining their natural abundance meets wildlife management objectives. Mushroom management and/or preservation of critical mushroom habitat may also fit very well in sensitive watershed areas where timber production is constrained anyway. Or, as another example, it may make sense to manage bigleaf maple with its potential for sap and syrup production as part of a strategy for meeting riparian management objectives.

These examples highlight opportunities for expanding NTFP production in concert with other objectives, but they have yet to be incorporated into strategic management practices that specifically enhance NTFP production. With ongoing research into possible compatible objectives for timber and non-timber uses, future land use planning may be able to incorporate NTFP management opportunities on a consistent basis. One key lesson from the case studies was the evidence from harvesters' surveys that from a harvester's perspective, timber production itself is not necessarily a hindrance for NTFP production. The majority of respondents saw limits to NTFP production resulting from a general lack of awareness of the opportunities for compatible management, combined with a lack of appropriate tenure options as the limiting factors. With this in mind, making foresters and other professionals more aware of the possibilities in this scenario could help to realize its potential advantages.

Scenario 3: NTFP management or rights

While many provinces in Canada have a high percentage of Crown lands within the land base, there are significant tracts of private lands in many provinces, which may turn out to be the best proving ground for testing the management of NTFPs. Quite simply, the clear property rights on private land ensure that compatible forest management may be tested and applied with appropriate ownership incentives for NTFP management investment in place. There are many instances where appropriate NTFP management strategies may produce additional revenues for landowners. For example, selling exclusive permits to NTFP companies or harvesters could potentially offset the costs of timber production. With such permitting in place, NTFP producers may also be able to do specific silvicultural operations such as thinning and spacing in order to enhance NTFP production while also reducing silvicultural costs for the landowner (Cocksedge & Titus 2006).

Among the case studies presented in this issue, the salal study serves as an example of how an NTFP may generate additional revenues for a landowner. There are several instances where private timber companies are selling area-based permits to NTFP buyers and harvesters on Vancouver Island. On the basis of these exclusive permits, NTFP producers have a vested interest in patrolling the licensed area to prevent trespassing. Permittees also have an incentive to manage the resource and prevent over-harvesting. In addition, there are cases where salal harvesters have been trained to thin and space the canopy and fertilize plantations to maintain and enhance salal production while benefiting timber production and quality.

A second example of an NTFP in this category is bigleaf maple. All the producers interviewed in the big leaf maple case study operated on private lands, where there are incentives for investment in stand management for sap production. Producers reported that all the current stands being tapped are natural bigleaf stands in a managed forest setting, rather than a cultivated plantation setting. These stands are typically small pockets of bigleaf mixed into a coniferous forest setting. Some of these stands are in riparian zones, which have greater sensitivity to timber production from an environmental standpoint. In such locations in particular, the development of bigleaf stands for sap production also offers the environmental benefit of maintaining healthy riparian habitat and its associated biodiversity.

Other areas that could be potentially managed for NTFPs include First Nations Treaty lands, First Nations reserves, Community Forest Tenures (which in B.C. have rights to manage and benefit from NTFPs), and land managed by B.C. provincial Crown woodlot licensees. With the appropriate property rights in place, the deliberate management and protection of NTFP investments would make sense. Continuing research into compatible management opportunities in these areas would help to realize the opportunities for commercial development of NTFPs and their associated benefits. It is the opinion of the researchers, that with the proper management strategies in place, a higher and better use of some these private lands can be achieved when economic and environmental objectives expand beyond timber production on a per hectare basis.

Scenario 4. Management for emerging values

This kind of scenario is only just beginning to emerge in Canada, so this discussion can only explore future possibilities that are in the formative stages. It seems likely that NTFP management over large areas of forest lands will be undertaken less for the market value of NTFPs themselves than for the contribution such management strategies make to environmental objectives for which markets are now emerging. For example, the sale of carbon credits may provide an incentive to timber companies to extend the timber rotations to maximize carbon sequestration, and this in turn would benefit the natural production of NTFPs like pine and chanterelle mushrooms. In jurisdictions such as Costa Rica, payments for maintaining biodiversity have been implemented and enhancing NTFPs in given regions is one way to meet such objectives (Zuniga 2003) As a final example of how environmental benefit can be linked with NTFPs, it should be noted that many NTFPs have the potential for enhancing water quality by providing streamside soil stabilization and general water filtering mechanisms. They are therefore beneficial in maintaining water quality in watersheds (Dept. of Fisheries and Oceans, undated; Schultz et al. 1995).

Conclusions

During the last twenty years, NTFPs have crept slowly onto the radar screen of governments, researchers, and forest managers in Canada. More recently, economic, environmental and socio-political trends have focussed greater attention on both the fragility of conventional forestry and the potential for other products and services to be produced in conjunction with, or instead of, traditional forest commodities. This project, in conjunction with other research and policy work that has been conducted in British Columbia, over the past several years, suggests that, while NTFPs will rarely be a dominant focus of forest management except on a small scale akin to 'agroforestry', this forest sector can contribute to, and benefit from, development in conjunction with many other objectives of sustainable forest management. Of the four scenarios outlined above, we suggest that the largest volumes of NTFP 'commodities' such as floral greens and wild mushrooms will continue to be extracted from 'scenario 1' lands, at least for the foreseeable future. These lands constitute the greatest proportion of forest areas in most provinces and, except where more pronounced incentives emerge, it seems unlikely that either public or private interests would be willing to undertake significant investments in stewardship and value

addition. At the same time, there are many simple, inexpensive steps that could be taken to enhance non-timber production, with either neutral or beneficial impacts on timber production, several of which are discussed in Cocksedge (2006). In many cases, simply improving communication and coordination among harvesters, and between timber and non-timber interests, could generate significant benefits.

In terms of focussing scarce resources on NTFP research and development, we believe the greatest short to mid-term impact will likely occur in scenarios 2 and 3, with a focus for long term planning and development on scenario 4. In scenario 2, managing for NTFPs is, or can be made to be, compatible with protection of many other – often non-commercial – values and may assist in offsetting the costs of activities such as riparian management, enhancement of wildlife habitat, or fire prevention. In scenario 3, forest owners and managers already have practical or legal rights to manage for, and benefit from, NTFPs. In these cases, investment should focus on market research and development, product development and production techniques – preferable as joint investments with agroforestry/horticulture research and development. In both scenarios, lessons learned can be extended to the broader forest management community and can help define a research and planning context for the 'next wave' of emerging forest products and services in Scenario 4.

As Belcher and others (2003) have observed, it is not possible to have all of one's cake and eat it too - development and conservation objectives for NTFPs are not 'naturally' compatible, although they may offer more potential for compatibility than industrial scale extraction of forest commodities. By examining the various actual and possible scenarios for forest management, it should be possible, however, to produce more value in many instances by aligning NTFP use with other management objectives and by recognizing that there is no 'one size fits all' for NTFP management and policy across Canada.
To achieve this result, the clarification or creation of appropriate property rights – among other necessary measures - will be essential to support stewardship of, and investment in, emerging forest resources. An approach to identifying and testing appropriate institutional arrangements is suggested below as part of an integrated approach to forest management and rural development.

Rural Development and Forest Policy

In the same way that forest management needs to consider forest resources as an integrated whole in order to achieve sustainable and optimal use of the full complement of resources, policy and programs directed to retaining and restoring viable rural communities need to look beyond 'silver bullet' solutions or a dominant focus on one alternative sector, such as tourism. The Centre for Non-Timber Resources and other partners have proposed that policy experiments, or adaptive case studies, be implemented through agreements with a number of willing partners to determine the interest and needs of resource dependent communities in developing non-timber resources as part of a strategy of economic stabilization and development consistent with cultural, social and environment values. These cases – which would be initiated across B.C. regions - would address a range of institutional arrangements (property rights) for non-timber resources in addition to identifying and supporting local entrepreneurship, the development of regional or provincial NTFP networks for, e.g. marketing and sector advocacy, and the development and extension of methods of managing forests compatibly for timber and non-

timber products and services. With the creation of the B.C. Interagency Committee on Non-Timber Resources, chaired jointly by the Ministries of Forests and Range and Agriculture and Lands, and the committee's support in principle for the 'case study' approach, there appears to be growing potential for the implementation of such initiatives.

SUGGESTIONS FOR FUTURE RESEARCH

This project has identified a number of areas of additional research, some of which, such as the 'adaptive case studies' action research proposals are already in development. A key finding of the project – the challenges involved in documenting NTFP production volumes and values – has formed the basis for a related project developed to submit an application to Statistics Canada to change the harmonized codes for some of the most significant commercial NTFPs. This project is funded by NR Canada, and the province of B.C. Ministry of Forests and Range, and Ministry of Agriculture and Lands and will submit an application for approximately 6 NTFPs that are commercially traded and exported from Canada.

As noted above, the CIFOR methodology, while very useful in identifying key variables and considerations, has several limitations, one of these being the focus on a single species. This emphasis limits the analytical power of the model with respect to the role of the NTFP sector in a local, regional or provincial context; few North American communities focus in a major way on a single species, as is more often the case in the developing world. The methodology is also limited in its attention to forest management policy and practices and to the cultural, recreational and other 'non-consumptive' values of NTFPs, which may be equal to, or of greater significance than, market values to 'northern' consumers. It is necessary, therefore, to adjust and expand the methodology to address a variety of policy relevant issues and expand the model to include these other values that have been mentioned. CNTR researchers have begun this process, and have embarked on two book projects in collaboration with researchers from CIFOR, Rhodes University (South Africa) and other international partners that will be informed by the revised methodology. Both projects – one of which is an invited volume for Springer publishers, will address, among other topics, comparative analysis of NTFP values and institutional arrangements in the 'north' and the 'south'.

Another area of required research relates to our still very limited understanding of the nature of the NTFP sector and in particular the knowledge about who harvests NTFPs, for which purposes, and volumes extracted. There is a general lack of understanding of commercial, recreational and traditional NTFP uses within the forest sector and models and methods for capturing a better understanding of resource use is needed. An area of research that is virtually untouched in Canada, although not in the United States, is sociological research on harvester populations, livelihood strategies and the significance of NTFPs in employing rural, immigrant, and mobile populations. Research of this type is essential if appropriate labour market policy and programs are to be established with respect to NTFPs and other emerging forest resources.

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