

# **Integrating Non-Timber Forest Products into Forest Planning and Practices in British Columbia**

**Special Report**



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## Acknowledgements

This report was developed for the Forest Practices Board by the Centre for Non-Timber Resources at Royal Roads University (CNTR), Darcy A. Mitchell, Ph.D., Director.

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The Forest Practices Board recognizes the complexity of the subject matter of this report and the wide range of concerns and interests that require more in-depth analysis, discussion and resolution. We also acknowledge that a report of this nature cannot represent the full range of perspectives on this important forest resource.



Bruce Fraser, Chair  
Forest Practices Board  
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All photos courtesy of the Centre for Non-Timber Resources at Royal Roads University.

## Executive Summary

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Non-timber forest products (NTFPs) are an important forest resource in British Columbia, with the potential to make a significant economic contribution to small, resource-based communities. Non-timber forest products, also known as non-wood forest products and botanical forest products, include all the human-exploited uses of plant and fungal species of the forest, other than timber, pulpwood, shakes or other wood products. Rough estimates from 1997 placed the value of this resource at \$680 million in provincial revenues and the sector has likely grown since then.

The harvest of NTFPs is currently unregulated in BC and this creates a whole range of issues, from lack of government revenue, to potential over-harvesting of the resource, to infringement of aboriginal rights and First Nations' traditional use of NTFPs.

Sound management of BC's public forest lands should include appropriate measures to conserve and develop NTFPs, recognizing that:

- opportunities exist to further develop the commercial NTFP industry in BC; and
- First Nations have rights to NTFPs arising from traditional uses of these forest resources.

The Forest Practices Board has been involved with NTFP issues mainly through its public complaints program, and has identified potential impacts of timber harvesting on NTFPs, as well as concerns about the sustainability of the harvest of NTFP resources themselves. In the late 1990s, the Board recommended that government enact a botanical forest products regulation under the Forest Practices Code, but that recommendation was never implemented.

This report provides a high-level review of the non-timber forest products sector, impacts of forest practices on NTFPs, opportunities to address NTFPs in forest planning and practices, and examples of innovative approaches to doing so. Through this report, the Board hopes to raise awareness of the importance of NTFPs as a forest resource, and to encourage government and forest managers to actively address the relationship between forest planning and practices and NTFPs.

The report notes that there is room for improvement in several areas:

- There is a need for better knowledge about NTFPs – the economic importance and potential of the resource, as well as the science to manage the resource in a sustainable manner.
- It is possible to integrate management of NTFPs with the management of timber. Better integration will require:
  - greater awareness of NTFPs within the forest industry;

- land use and sustainable resource management plans that set clear and measurable objectives for NTFP resources to guide timber harvesting; and
- operational planning mechanisms that address NTFPs, including forest stewardship plans and public and First Nation consultation activities.
- The lack of regulation and rights, or tenure, to harvest NTFPs makes it difficult to develop the sector in a sustainable manner. The lack of regulation also means there is no mechanism to enforce sustainable management of the resource, and the current free reign to gather these products from public and private lands in turn creates little incentive for regulation or tenure arrangements.

The report concludes with the following recommendations:

1. Government should conduct the research necessary to quantify the current economic contribution of the NTFP sector to the province and its contribution to economic diversification of rural communities. Government should also continue to support and undertake research to develop knowledge about compatible management of timber and NTFP resources, and sustainable management of NTFPs.
2. Government should further explore the options for regulating the NTFP industry in light of:
  - its importance for income and employment;
  - the need for sustainable management of the NTFP resource; and
  - its cultural and economic importance to First Nations.
3. Government should establish objectives for NTFPs under the *Land Act*, through sustainable resource management plans, to guide forest planning and practices where NTFPs are an important local resource for economic and/or traditional uses.
4. Government, the forest industry and professional associations should promote awareness amongst foresters and other resource management professionals, as well as the NTFP sector and First Nations, about the opportunities and challenges of integrating the sustainable management of timber with NTFPs.

# Table of Contents

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|   |            |
|---|------------|
| <b>Acknowledgements</b> .....   | <b>iii</b> |
| <b>Executive Summary</b> .....  | <b>i</b>   |
| <b>Introduction</b> .....   | <b>1</b>   |
| <b>Background</b> .....   | <b>2</b>   |
| <b>Traditional Use</b> .....  | <b>2</b>   |
| <b>Commercial Use</b> .....   | <b>4</b>   |
| Table 1: Commercial Profile of NTFPs .....  | 5          |
| Case Study #1: Ktunaxa Kinbasket Tribal Council (KKTC) – Traditional and<br>Commercial Use of Huckleberry ..... | 7          |
| <b>Conservation of NTFPs</b> .....  | <b>8</b>   |
| <b>Regulation of NTFP Harvesting</b> .....  | <b>8</b>   |
| <b>Integrating Forest Practices and NTFPs</b> .....   | <b>10</b>  |
| <b>Impacts of Timber Harvesting Activities</b> .....  | <b>10</b>  |
| Operational Planning.....   | 10         |
| Timber Harvesting, Road Construction and Access Management .....  | 10         |
| Establishing a New Stand of Trees.....  | 11         |
| Case Study #2: Coordinating Road Construction and Whole Plant Extraction .....                                  | 12         |
| Case Study #3: Do Burnt Forests Create New Opportunities? .....   | 14         |
| Case Study #4: Managing for Commercial Quality Salal.....   | 15         |
| Table 2: Summary of Impacts of Forest Practices on NTFPs.....   | 16         |
| <b>Current Regulatory Framework for Forest Practices</b> .....  | <b>17</b>  |
| Legal Requirements to Address NTFPs .....   | 17         |
| Case Study #5: Kispiox Land and Resource Management Plan – Incorporating Pine<br>Mushroom Habitat .....         | 19         |
| Opportunities for NTFP Incorporation in Sustainable Resource Management Plans.....                              | 20         |
| <b>Information Needs</b> .....  | <b>21</b>  |
| Case Study #6: Nisga’a Lands - Integrating Pine Mushrooms into Forest Planning and<br>Practices.....            | 22         |
| <b>Conclusions</b> .....  | <b>24</b>  |
| <b>Recommendations</b> .....  | <b>26</b>  |
| <b>References</b> .....   | <b>27</b>  |

## Introduction

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The Forest Practices Board (the Board) is the public's independent watchdog for sound forest practices in BC. The Board's mandate includes auditing forest practices, investigating public complaints and pursuing administrative appeals (see [www.fpb.gov.bc.ca](http://www.fpb.gov.bc.ca)). The chair of the Board has the authority to release special reports about forestry issues considered to be in the public's interest. The Board promotes stewardship of the full range of forest values in public forest lands in British Columbia.

Non-timber forest products (NTFPs), also known as non-wood forest products and botanical forest products, include all the human-exploited uses of plant and fungal species of the forest, other than timber, pulpwood, shakes or other wood products. The commercial harvest of NTFPs from forest lands is a significant economic activity in British Columbia. In some areas it is important to rural economic development. This report discusses some of the challenges and opportunities facing NTFP management in BC.

In the course of the Board's work, it has responded to various issues related to impacts of forest practices on NTFPs. The Board has received complaints and concerns from the public about the sustainable harvest of non-timber forest products (moss, salal) and the impacts of forest practices on these products, as well as rare or endangered species of mushrooms. In the late 1990's, the Board recommended that government enact a botanical forest products regulation under the Forest Practices Code to ensure sustainable harvest of these products, but no such regulation was implemented.

More recently, the Board's response to the Results Based Code discussion paper<sup>1</sup> recommended that the new legislation include a framework for commercial use of forest resources other than timber. Related issues have arisen in the course of a special report on adequately managing and conserving forest resources,<sup>2</sup> and in an appeal to the Supreme Court of Canada regarding the principles to consider when setting compensation for damage to environmental values,<sup>3</sup> which could include NTFPs. Concerns about NTFPs have also arisen during the course of community visits where Board members met with the public to listen to their concerns about forest practices.

The report does not address forage or range practices, although the Board recognizes that forage is also an important resource from forest and rangelands.

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<sup>1</sup> *Forest Practices Board Comments on the Government's Discussion Paper: A Results-Based Forest and Range Practices Regime for British Columbia*, Forest Practices Board, June 2002

<sup>2</sup> *Section 41 of the Forest Practices Code - Adequate Management and Conservation of Forest Resources*, Forest Practices Board, March 2002

<sup>3</sup> *Canadian Forest Products Ltd. v. British Columbia*

This is a growing industry with opportunities for innovative approaches to management and regulation. There are situations in BC where creative solutions have been developed to enhance NTFPs. Some of these are described in case examples interspersed in the text to illustrate some specific challenges and opportunities for integrating forest practices and operational planning with NTFPs.

## **Background**

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Today in British Columbia's forests, many plant species other than trees are used for personal, social, traditional or commercial purposes. Over 200 species of plants and fungi are being harvested throughout the province including wild edible mushrooms, floral and greenery products, medicinal products, wild berries and fruit, herb and vegetable products, landscaping products, craft products and miscellaneous products such as honey. In northwestern North America, there are over 500 plant species that have specific cultural applications among aboriginal peoples, mainly from forested areas (Turner, 2001).

### **Traditional Use**

First Nations have always seen a diverse forest as part of their livelihood, culture and traditions. Interior and coastal tribes had large annual gatherings where resources from their traditional territories were traded for those from other territories. In her 2001 report, Turner documented many examples of traditional foods (fruits, green vegetables, root vegetables, and other); wood for construction and manufacture; wood and other materials for fuel; fibrous plants (e.g., baskets); and plants used in technology (e.g. in food processing, adhesives, waterproofing). Medicinal plants were used for purposes such as general tonics, purgatives, laxatives, salves, medicines for respiratory ailments, and aids for internal ailments. Processed products were valued more highly than raw products. Medicinal products based on specialized hereditary knowledge were of much higher value than more commonly known species and uses. Among individual language groups, the number of named culturally important plant species range from about 120 to 350 that are used for foods, materials, medicines and/or spiritual purposes.

This traditional socio-economic structure changed with the advent of the fur trade followed by the transition to the current modern economy. However, many First Nations are concerned with cultural revitalization, as well as NTFP economic diversification opportunities.

| <b>Examples of Traditional Use</b>   |   |
|--|---|
| <b>North Coast</b> <ul style="list-style-type: none"> <li>❖ Medicinal</li> <li>❖ Berries, e.g., salal</li> <li>❖ Cedar wood and bark</li> </ul>  | <b>North Interior</b> <ul style="list-style-type: none"> <li>❖ Sedges, sage, sweet grass, red willow</li> <li>❖ Berries and wild edibles</li> </ul>               |
| <b>South Coast</b> <ul style="list-style-type: none"> <li>❖ Cedar wood and bark</li> <li>❖ Medicinal</li> <li>❖ Wild edibles (lily family)</li> <li>❖ Wild Berries (blackberry, strawberries)</li> </ul> | <b>South Interior</b> <ul style="list-style-type: none"> <li>❖ Medicinal</li> <li>❖ Berries, e.g., huckleberries</li> <li>❖ Wild edibles (bulb plants)</li> </ul> |

First Nations have traditional resource management techniques to maintain the productivity of the land and ensure diverse and abundant plant species for their own activities and to provide forage for game. These include:

- seasonal pruning;
- limiting access;
- application of fire for ethnobotanical needs; and
- selective harvesting of plants.

Some First Nations have also recommended techniques that address contemporary forest management practices, including:

- certification of pickers;
- education in mechanical site preparation;
- reduction of tree spacing levels; and
- increased sensitivity regarding rare and endangered medicinal plants.

(Tmíkw for Nicola Tribal Association, p. 14-18 in Tedder et al.)

First Nations continuing traditional use of understory species is an important constitutional right. Challenges to the realization of this right include the lack of secure and continuing access to resources, the need to maintain abundance and sustainability of diverse plant and fungi species, the impacts of increasing and unregulated commercial harvesting on traditional uses, and forest practices including the use of herbicides and densely timbered stands that shade out understory species.

First Nations rights to their traditional knowledge is an important issue arising from the commercial use of NTFPs, especially in the case of products such as pharmaceuticals. Some First Nations are concerned that traditional medicinal knowledge of plants can be used for commercial profit without permission or due compensation. However, these issues are beyond the scope of this report.

## Commercial Use

The commercial harvest of NTFPs has been occurring for several decades and is believed to be expanding. One study (Wills and Lipsey, 1999) estimated that in 1997 the commercial harvest of wild mushrooms, floral greens and other products employed almost 32,000 people on a seasonal or full-time basis, which generated direct business revenues of \$280 million and overall provincial revenues in excess of \$680 million. However, there is a lack of recent economic data available for the industry in BC and what does exist is based on rough estimates.

Wild edible mushrooms, such as the pine mushrooms and pacific golden chanterelles, are the main commercial species, followed by the floral greens (salal, sword fern, boxwood, evergreen huckleberry and boughs). Craft materials are important for Christmas decorations and home decor. Berries have grown in commercial importance as demonstrated by the presence in some areas of the province of non-local commercial wild huckleberry pickers. There is growing commercial potential of herbs, roots and other plant and fungal species for their nutritional and medicinal properties, either as whole plant or extracted compounds. Other products are important for native art work such as carvings.

| <b>Examples of Commercial Use</b>  |   |
|--|---|
| <p><b>North Coast</b></p> <ul style="list-style-type: none"> <li>❖ Pine mushrooms</li> <li>❖ Chanterelles</li> <li>❖ Salal</li> <li>❖ Berries</li> </ul>   | <p><b>North Interior</b></p> <ul style="list-style-type: none"> <li>❖ Ostrich ferns</li> <li>❖ Fiddle Heads</li> <li>❖ Cedar boughs</li> <li>❖ Mushrooms</li> </ul>   |
| <p><b>South Coast</b></p> <ul style="list-style-type: none"> <li>❖ Salal, boxwood, ferns</li> <li>❖ Pine mushrooms</li> <li>❖ Chanterelles</li> <li>❖ Moss</li> <li>❖ Boughs for décor and essential oils</li> </ul> | <p><b>South Interior</b></p> <ul style="list-style-type: none"> <li>❖ Pine mushrooms</li> <li>❖ Materials for crafts</li> <li>❖ Species for alternative medicines</li> <li>❖ Wild edibles</li> <li>❖ Berries</li> </ul> |

There are not recent data; however, based on the estimated 1997 revenues for mushroom and floral greens sales (\$55-60 million, Wills and Lipsey in Tedder et al., p. 10), and the apparent growth of these industries, it is reasonable to expect that NTFPs are at least as economically important to some local areas as other non-timber forest uses that are licensed, such as commercial recreation, guide outfitting or range. The industry provides opportunities for rural-based harvesters, buyers, and urban retail and manufacturing facilities. Harvesters may be local residents looking for supplemental income, or full-time migratory workers picking the high value products such as pine mushrooms

and/or species such as morels, which fluctuate annually in their abundance and availability depending on weather and forest conditions.

In the United States Pacific Northwest, the potential of NTFPs is under active review in response to public and legislative attention that raised a variety of management issues (Vance, 2001). The NTFP sector, especially mushrooms and floral greens, is particularly significant for rural economies where timber harvesting and processing has declined. State forests in Washington, Oregon and Montana have education and training programs for landowners and harvesters and these states have developed a variety of mechanisms to regulate the NTFP sector (Tedder et al., 2002).

Table 1 profiles various commercial uses of NTFPs, and the most recent economic information on the industry from 1997 (Wills and Lipsey, 1999).

**Table 1: Commercial Profile of NTFPs**

| <b>Types of Plants</b>  | <b>Purpose</b>   |
|---|--|
|   | <b>Food</b>  |
| <b>Mushrooms</b><br>Pine mushrooms are most valuable – others include chanterelles, morels and boletes. | In 1997, 16 companies harvested, bought or sold BC wild food mushrooms. Seven companies control over 90% of the exports by weight from Vancouver to Japan (pine mushrooms). Due to variable seasonal fruiting conditions, before-tax revenues range from \$25 million to \$45 million.<br><br>European and North American markets consume chanterelles (750,000 kg. in a good year), morels (225,000 kg.), boletes (100,000 kg.), and other species (50,000 kg). |
| <b>Berries, Roots</b><br>Many berries, fern shoots (fiddleheads)  | Very important for traditional food and for cultural tourism and direct product sales. Berries, such as huckleberries are used in preserves, soaps, and flavourings. There is no information on the volume of huckleberries picked commercially in B.C. In 1996 in Montana, 27 metric tons of huckleberries processed by 14 manufacturers generated US \$1.5 million in product sales.   |
|   | <b>Health</b>  |
| <b>Mushrooms and other Fungi</b><br>Matsutake (pine)  | The world market for wild nutritional and medicinal mushrooms, extracts and products was US \$1.3 billion in 1997. Demand is from Asia, where medical research indicates that polysaccharides, terpenes, and steroids etc. found in many BC mushrooms have antibiotic, anti-tumour, and antiviral properties, reduce lipids in blood and stimulate the immune system.  |
| <b>Herbs, Roots, Bark</b><br>St. John's wort, cascara bark, yew bark, oregon grape, devil's club,       | The world market for herbal medicines is around \$14 billion annually. Pharmaceutical multinationals are buying up producers of herbal medicines. With time, companies frequently learn to synthesize the active ingredient(s) (e.g., yes), but there remains a strong and growing   |

|   |   |
|---|---|
| nettles, burdock, yarrow, mullein, arnica, camomile, tansy, rose hips, lichens and others                                     | market for part and whole plant products. Gathering of medicinal botanicals centres in the southern Interior (the Kootenays, Slocan, and the Okanagan). In 1997, the estimated gross revenue paid to 15-20 serious BC commercial collectors was \$2 million to \$3 million.   |
|   | <b>Floral Greenery</b>  |
| <b>Shrubs and Brush</b><br>Salal, ferns (sword fern and deer fern), moss, cedar boughs, huckleberry, boxwood and oregon grape | In 1997, the collective gross revenue of 22 firms in BC was \$55-\$60 million. The estimated 1997 number of commercial pickers in BC was 13,000. Four companies sell direct to Europe, 18 smaller firms sell to US companies, who in turn sell to Europe. Other markets are Japan and Hong Kong.  |
|   | <b>Arts and Crafts</b>  |
| <b>Cedar, yew, cones, lichens, moss, twigs, stumps, cedar, bark</b>   | Cedar and other species for Native Art—e.g. masks, carvings and dye. Native art generates significant income. A single birch tree can make over \$1,000 in masks, bowls, spoons and baskets (Turner, 2001). Bark and needles lichens, moss and twigs are used for products for interior decorating, art, Christmas wreaths, buttons, etc. |
|   | <b>Oil Extracts</b>   |
| <b>Evergreen boughs such as cedar and pine, and herbal plants</b>   | Manufacturers of essential oils are established industries, with cedar oil being one of the most longstanding NTFP products. The extract is of high value for medicines such as Vicks VapoRub, and fragrances for perfumes, lotions and cleaners.   |
|   | <b>Native Plant Landscaping</b>   |
| <b>Ferns, floral plants, shrubs, grasses</b>  | There is a growing demand for native plants for both forest (road and ecosystem restoration) and urban landscaping. Forest seed nurseries are longstanding businesses, but many are now venturing into native seed production and cultivation.  |
| <b>Lichens, leaves and roots of plants, fruit, dead insects and other organisms</b>   | <b>Biological Control Agents</b><br>“Biocides” are made from chemicals, fungi or bacteria to help repel insect pests, fungal invasions and other plant diseases. This is a small sector compared to synthetic and more toxic products such as herbicides. World biocide use is growing at over 14% annually.                              |
|   | <b>Other</b>  |
| <b>Fireweed, bark, wood, etc.</b>   | Beehives for honey, especially where fireweed abundant, mulch from bark, firewood, wood for smoking fish, etc.  |

**Case Study #1: Ktunaxa Kinbasket Tribal Council (KKTC) –  
Traditional and Commercial Use of Huckleberry**

**Issue:** The potential exists to manage huckleberries without significantly reducing timber production. Increasing commercial berry harvest is affecting First Nations' traditional use, and also possibly driving bears into towns in search of other food. Careful choices in the implementation of post-wildfire forest practices might make berries more plentiful for both humans and bears.

**Background:** Blueberries and huckleberries are an important component of food webs in forest ecosystems, critical to birds, small mammals and bears. The black huckleberry is a "keystone" species for bears and pre-contact First Nations and remains as one of the most revered food plants by the Ktunaxa Nation. It is also a favourite berry species of recreational and commercial pickers.

Over the last decade there has been a large increase in the commercial and recreational huckleberry pick. Elders of the Ktunaxa Nation have reported being forced out of traditional berry patches by commercial pickers. Commercial pickers typically use combs and rakes, raising concerns that they leave little for wild life or other human users. It is not known what level of harvest is sustainable, which is further complicated by the highly variable berry yields.

Some berries are shipped for sale to the United States, while others are sold through local markets. The exported berries are used for a variety of purposes including preserves, soaps and flavouring in beer and salad dressings. Some First Nations and rural communities are pursuing the commercial development of wild berries to maintain traditional and rural values. There is no information on the volume of huckleberries picked commercially in BC. In Montana, there were more than 27 metric tons of huckleberries processed by 14 manufacturers in 1996, generating US \$1.5 million in product sales.

**Forestry Implications:** Huckleberry plants produce most prolifically in open to semi-open conditions, especially after fire in the early seral stages of stand development. The current trend towards aggressive reforestation tends to reduce the amount of time for optimal huckleberry production, as the trees obtain canopy closure earlier than in the past. The use of herbicides for conifer release also has the potential to negatively affect future berry yields.

The Lamb Creek fire in 2003 burnt a large area of forest land managed through BC Timber Sales that is known as the best local area for huckleberry production. The KKTC requested that BC Timber Sales consider reduced conifer stocking for the reforestation of significant areas of this wildfire, in order that the huckleberry resource be properly managed. These reduced stocking areas may serve as firebreaks and would have higher vegetative biodiversity.

The KKTC will be conducting huckleberry regeneration trials over the burnt area to see which level of fire intensity and elevation produces the most rapid berry bush regeneration. This project will aid in the selection of berry management zones. Berry management zones would provide further opportunities to manage for more abundant berries.

## Conservation of NTFPs

No one can predict which species of the forest will be significant in the future—especially given the potential and interest in biological materials for medical biochemical research. Managing for biodiversity, including the conservation and recovery of rare and endangered ecosystems and species, ensures that the full range of plants and fungi will be present for current and future uses. A pristine, natural source of botanical products and services increases their value in the same way that organic certification confers a premium on agricultural products. Cultural and ecological tourism both also depend on the natural richness and beauty of the province’s forests.

Biological diversity, or biodiversity, refers to the diversity of plants, animals, and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and ecological processes that link them.



Simply maintaining a species so that it does not become extinct or extirpated<sup>4</sup> does not mean that it will be sufficiently available for commercial or traditional use. For sustainable economic use, appropriate quality, quantity and access to NTFPs are required. Understanding conservation ecology as well as the commercial objectives for the management of a species—be it a timber or a non-timber resource—is necessary to achieve sustainable forest management. Both timber and NTFP practices need to consider the whole ecosystem function in order to achieve sustainable forest management.

## Regulation of NTFP Harvesting

The *Forest Act* enables government to issue tenures, licences, and permits such as tree farm licences, forest licences, and timber sales to harvest timber. The community forest tenure is the first tenure in British Columbia that also can convey the rights to harvest NTFPs. The Harrop-Procter Community Forest Pilot Agreement was the first forest agreement or licence in British Columbia to include the commercial harvest of non-timber forest products. While the tenure form is recent, early

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<sup>4</sup> **Extinct:** Extinct species no longer exist. **Extirpated:** Extirpated species no longer exist in the wild in British Columbia, but occur elsewhere.

indications are that community forests will manage for both timber and NTFP products.<sup>5</sup>

The *Forest Practices Code of British Columbia Act* (the Code) (enacted 1995) contained provisions for the Lieutenant Governor in Council to make regulations respecting botanical forest products. The new *Forest and Range Practices Act* (enacted in late 2003) enables regulations for botanical forest products that can include rules about product harvesting, issuance of licenses, fees, enforcement and appeals. Despite this enabling authority, government has not chosen to regulate the commercial NTFP sector yet, nor does the Ministry of Forests' service plan anticipate such regulation.

Government's only NTFP regulation was for cascara bark harvesting when it was in high demand by pharmaceutical companies for medicinal purposes. That regulation has since been repealed. In the 1980's and 90's, guidelines were developed for the harvest of yew tree bark for the production of taxol for cancer fighting drugs, but a regulation was never developed. Some forest districts also issue a special use permit to authorize short term harvest of NTFPs, such as Christmas trees and evergreen boughs (Atwood, 1998) on specified areas of Crown land.

The choice to allow "free access" to NTFPs creates little administrative burden for the government and the NTFP sector. At the same time, it raises several other issues:

- There is no direct government revenue generation to support stewardship of, and investment in, the resource.
- No NTFP information is collected (e.g., location, volume and value harvested).
- The lack of regulation or information on the harvesting of NTFPs makes the collection of income taxes more difficult.
- There is little obligation or incentive for harvesters or buyers to sustainably manage the NTFP resource and over-harvesting could result.
- The NTFP sector is limited in security and potential growth because banks and other loan agencies are usually not willing to lend to entrepreneurs without legal rights to the resource.
- There are no enforceable standards set for NTFP harvest operations (e.g., safety, fire protection, camp standards, harvest standards).
- NTFP harvesters are not required to consult with First Nations about impacts of NTFP harvesting on traditional uses.

The lack of regulation also poses policy and planning challenges for the implementation of forest practices that recognize and accommodate NTFPs. Without rights to the resources they depend on, harvesters may not want to reveal important NTFP locations that merit protection or enhancement, fearing that other harvesters will move into

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<sup>5</sup> The Harrop-Proctor Community Forest is working to create an inventory of sustenance and medicinal plants and conducting sustainable harvesting trials for devils club, wild sarpasparilla and prince's pine (<http://www.hpcommunityforest.org>).

“their” areas. NTFP harvesters may also feel that forest licensees will not consider their comments and concerns as seriously as those of others who do have recognized rights to use forest resources, such as ranchers or tourism operators.

In recent years there have been studies<sup>6</sup> and proposals recommending pilot projects<sup>7</sup> to examine and test the various options for management of the NTFP resource, however, none of the recommendations have yet been implemented by government.

## **Integrating Forest Practices and NTFPs**

### **Impacts of Timber Harvesting Activities**

Forest practices can have a significant influence on the presence, abundance and distribution of NTFPs. Whether the impacts are “good” or “bad” depends on which NTFP species are desired and for what purpose. The same plant grown under different forest canopy conditions can have very different commercial- or traditional-use values. For example, salal for floral greenery needs partial shade, while salal grown in open sunlight produces berries for food.

### **Operational Planning**

Operational planning provides an opportunity for NTFP values to be identified and forestry plans to be designed to minimize negative impacts and even enhance NTFPs. An important component of operational planning is consulting with those who have an interest in, or are affected by, proposed forest practices. Accordingly, consultation with NTFP users and with First Nations can help identify potential issues and opportunities. Decisions made in developing the operational plans will determine how NTFPs are affected by forestry operations.

### **Timber Harvesting, Road Construction and Access Management**

Timber harvesting impacts can be positive or negative, and vary according to timing, silviculture system and harvesting method used.

Impacts to NTFPs relate to changes in sunlight and moisture levels, soil disturbance and the retention of coarse woody debris. Clearcuts can eliminate chanterelles and pine

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<sup>6</sup> Tedder, S., D. Mitchell and A. Hillyer. 2002. *Property Rights in the Sustainable Management of Non-Timber Forest Products*, Forest Renewal BC Report, Economics and Trade Branch, British Columbia Ministry of Forests, Victoria.

<sup>7</sup> *The Non-Timber Forest Product Collaborative Stewardship Project, Discussion Paper*, BC Ministry of Forests and Royal Roads University, May 2003

mushrooms from a site for decades, but can also substantially increase opportunities for berries such as huckleberries and herbs. Partial cuts, where some trees are left standing, can improve the abundance, vigour and value of understory species for floral greenery (e.g., boxwood and huckleberry). The transition zone between harvested areas and the adjacent forest with its canopy closure often provides a multitude of understory species.

Road construction removes plant cover permanently. However, whole plant salvage before road construction begins can create opportunities for NTFP harvesters if they are able to coordinate with forestry operations (see case study #2). Whole plants are in demand for native plant landscaping and forest restoration. Unregulated whole plant harvesting is not considered ecologically or ethically desirable because it can lead to local loss of a species. However, salvaging plants that would otherwise be destroyed by road construction could help meet this growing demand.

Access to NTFPs is the most significant implication of roads and trails. Road locations and whether or not they will remain open to the public post harvest are the main concerns. As one positive example, Western Forest Products ensures access to clearcuts for eight beekeepers at its Jordan River operation.<sup>8</sup> The ease of access to areas suited for commercial NTFPs affects how much harvesting can occur, and how many commercial pickers can access an area. However, increased access may in turn raise concerns about the level of harvest. For example, commercial harvesting pressures on Vancouver Island have led to a decrease in salal height, and now the sector must market so-called “shorts” instead of the longer, more lucrative stems in competitive international markets.

### **Establishing a New Stand of Trees**

After harvesting, a licensee is legally required to reforest the site. This may involve site preparation, artificial or natural regeneration, brushing, spacing, or other measures necessary to establish a “free growing” stand of trees. Herbicides are sometimes used to reduce competition of brush or other vegetation with crop trees. Herbicides are especially contentious with First Nations who are concerned about the loss of species they use for traditional food sources such as berries and medicinal plants, potential food chain assimilation in game species, the decrease in browse production and shift to less palatable species for wildlife.

The objectives of silviculture practices are primarily for timber production. In some cases, there can also be secondary objectives for wildlife, biodiversity or other forest values. Commercial and traditional use of NTFPs could warrant similar consideration. Specific practices for stand establishment would need to be developed, including species selection, planting stock, stem density and distribution, and brush control measures.

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<sup>8</sup> (personal communication, Doug Stables).

## **Case Study #2: Coordinating Road Construction and Whole Plant Extraction**

**Issue:** The public, nurseries, researchers and others are concerned about removing whole plants from forests. Removal of whole plants has been suggested as a potential way in which rural community members could benefit by removing whole plants in advance of planned logging roads or cutblocks where they would otherwise be destroyed. It was not known if this was economically viable.

**Background:** Large numbers of native plants are used in landscaping and restoration. Most of these plants are grown from seed, however, some are harvested as whole plants from the wild. Deer fern and sword fern are some of the most popular species in the native plant market.

Trials were conducted on northern Vancouver Island, in cooperation with Western Forest Products, to determine if it would be realistic for fern harvesters to: (1) coordinate with timber companies to locate the proposed road markings; (2) find nurseries who would purchase salvaged ferns; and (3) make money. Local trainees were hired and taught plant identification, site selection, sustainable harvesting methods, processing and marketing of deer and sword ferns. The trainees had a variety of backgrounds and included forest technicians, silviculturalists, tree planters, entrepreneurs and NTFP harvesters.

The trial demonstrated that salvage of ferns from proposed roadways was economically viable. Although the fern harvest period lasts only a few winter months of the year, the profit potential per day of harvest was relatively high. Local forest companies were willing to work with harvesters in locating suitable areas with proposed roadways. Native plant nurseries expressed their willingness to purchase salvaged harvested plants. A number of the trainees said that they would continue to harvest native plants for supplemental income. One now-successful entrepreneur stated: "We did timed plots to see if it was worthwhile for people to do this kind of work. I just went at it. Then at the end I asked Wendy what the ferns were worth. She told me and I said I was going into business next week. And I did." (From *Bonn, Glenn. 2004 "Portrait of a Fern Harvester," Beneath the Trees - Newsletter of the CNTR. March 04, 2004. p.10.*)

In practice, it would be important to explore options such as chain of custody certificates, to verify sustainable activity.

**Forestry Implications:** The success demonstrated with fern salvage could be extended to other native plant species across BC, wherever there are forest companies and whole-plant harvesters willing to work together.



## Stand Management

Stand management treatments such as juvenile spacing, thinning, pruning and fertilization are often undertaken to improve the economic value of timber. Juvenile spacing and commercial thinning decrease the density of trees and open up the forest canopy. This allows more sunlight to reach the forest floor, enhancing the growth of many brush and herbaceous species. Fertilization added to any of these treatments changes the competitive dynamics of the understory.

Carefully planned stand tending provides an opportunity to increase the commercial value of the understory, thereby offsetting some or all of the cost of the stand treatment. (See case study #4.) The NTFP annual harvest could increase the cost effectiveness of treatments such as spacing, thinning and pruning. For example, a forest company operating on private land trained bough harvesters to prune conifers. Permit fees offset the company staff time, the bough harvesters secured a source of evergreen boughs to produce essential oils and the timber quality was improved.<sup>9</sup> Another example where NTFPs can generate annual income is to manage for berries and salal to reduce the treatment cost.

However, this is an area that requires more research. Existing research about the response of understory species to stand tending practices tends to focus on the ecology of a specific species, the presence and abundance of forage for wildlife, the physical blockage to wildlife access, and understory damage resulting from the trees that are cut down.<sup>10</sup> Some of this research is decades old and these stands could be revisited to learn more about the response of the understory species over time.

Fire is another stand management tool that can benefit NTFPs. In some interior ecological zones, fire is a natural part of the stand replacement regime. First Nations traditionally used fire to maintain a varied landscape rich in species diversity. This periodic light burning reduced undergrowth and maintained access. Fire suppression has resulted in vast areas of trees too dense for understory plants, with negative implications for traditional use, range and wildlife. Restoration practices to reduce stand densities (spacing and burning) could help to increase understory forage and NTFPs.<sup>11</sup> (See case study #3.)

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<sup>9</sup> Personal communication, Bob Kopp

<sup>10</sup> J.B. Nyberg and D. W. Janz, Technical Editors. 1990. Deer and Elk Habitats in Coastal Forests of Southern British Columbia. Ministry of Forests and Ministry of Environment. Province of British Columbia.

<sup>11</sup> Holt, 2001

### **Case Study #3: Do Burnt Forests Create New Opportunities?**

**Issue:** Can forests be managed to encourage better morel and huckleberry production?

**Background:** Morel mushrooms and wild blueberries and huckleberries colonize fire-ravaged areas. They help ecosystems retain the nutrients released by burning, while providing products that are highly prized by the gourmet food industry.

Morels are currently unmanaged, and their ecology is poorly understood. When wildfires



occur it is difficult to predict morel productivity. Prescribed burns might be spaced to encourage a stable annual supply of morel habitat. Predisposing factors such as nearby morel harvests or beetle-attacked stands could be considered when deciding upon burning prescriptions. Other factors that control the intensity and timing of prescribed burns (season, weather, and litter depth) can also potentially affect fruiting. Using broadcast or

scattered burns in order to deal with post harvest timber slash is a forest practice that could be used to create more morel habitat. In any burn, adding inoculum or calcium fertilizer might encourage or prolong fruiting. Timber salvage operations may interfere with morel harvest, but nominal disturbance of sites prior to harvest (e.g. skid trails, etc.) may actually stimulate fruiting.



Traditionally managed by prescribed burning, blueberries and huckleberries have varied responses to fire, logging, shade and weather during pollination and ripening. Modern harvesters focus their activities in clearcuts and old wildfire areas. The relative importance of fire or harvesting impacts such as shade reduction, pruning of older unproductive stems, fertility changes, and the stimulation of sprouting or fruiting is unclear. The most

desirable berries (e.g. black huckleberry) generally require more than 60% sunlight for optimal fruiting. Burning initially reduces black huckleberry cover, but shoot and fruit production typically exceed pre-burn levels in 5-7 years. Intense burns can result in long-term setbacks.

**Forestry Implications:** Concerted efforts to map and study the response of morels, blueberries, and huckleberries after wildfires would improve our understanding of the ecology of these fire-adapted species. Experimental manipulation of the forest canopy, fire intensities and other treatments would further advance the information needed to sustainably manage and enhance these important non-timber forest products.

#### **Case Study #4: Managing for Commercial Quality Salal**

**Issue:** Although salal is abundant, only some types of habitat produce commercial quality salal that is free of blemishes, with good colour, leaf and stem form.

**Background:** Salal is a common evergreen shrub in coastal forests of BC, and its foliage is harvested for use in floral displays. Most salal is exported to Europe, although large amounts are also shipped to Japan and across North America or sold directly to local retailers. Between 12-15,000 people harvest salal foliage (either full- or part-time) in BC, and the collective gross revenue is estimated at up to \$60 million (Wills and Lipsey, 1999).

**Forestry Implications:** Clearcutting or aggregate variable retention harvesting (e.g., patchcutting) does not produce suitable habitat for salal until the next rotation begins to provide some shade. It is possible that cutting patterns that increase the length of stand edges on the landscape will increase commercial salal habitat under trees near the edges. By contrast, dispersed variable retention (e.g., shelterwood) harvesting that leaves adequate shade may improve commercial salal habitat for many years.

Thinning a ~50 year-old Douglas-fir stand on southern Vancouver Island from ~90% to ~75% canopy cover increased salal value from \$200 to \$500/ha. One forest company taught salal harvesters how to prune trees, which they now do for free. This benefits both the salal harvesters (increased salal production; safer and better access) and the forest company (increased timber value at no cost). The tree species chosen for planting also affects salal



quality. For example, western red cedar, a high value but slower-growing species, is favoured by salal harvesters because its drooping branches do not lead to full canopy closure, thereby prolonging the period of time that commercial salal is available beneath it.

On northern Vancouver Island, fertilizing young stands can increase salal value up to \$2,500/ha. However, salal value then drops about 6 years after fertilization as tree canopies close. Fertilization may therefore increase salal production in any one year, but reduce the number of years that it is available – and it is not yet known if there is an overall benefit. This would certainly change if fertilization was combined with pre-commercial thinning or pruning –especially if done at no cost by trained salal pickers eager to improve the salal crop. With salal values of up to \$10,000/ha on the richest sites, harvestable every two years, co-management options are worth exploring, thereby benefiting both the forest and salal industries. (Titus & Cocksedge, pers. comm.)

**Table 2: Summary of Impacts of Forest Practices on NTFPs**

|  | <b>Timber Harvesting and Roads</b>   |
|--|--|
| Road Construction                                  | Removal of NTFP species from road corridors.   |
| Clearcut   | Opportunities for whole plant salvage.<br>Increase in herbs and shrubs. Favourable to sunloving berry producers such as huckleberry and salal.<br>Eliminates commercial mushroom habitat for many decades due to factors such as soil compaction, loss of litter layers, loss of host tree species and changes in conditions of the nutritional substrate status from the coarse woody debris or live trees. |
| Partial Cut  | The extent that fungi, mushrooms, microbes and other NTFPs associated with mature stands will be impacted depends on how the partial cut mitigates the impact of harvesting for each species.  |
|  | <b>Establishing a New Stand of Trees</b>   |
| Reforestation                                      | Species and stocking standards impact NTFPs in stand establishment and continues to do so in future stand developmental phases.  |
| Brushing, spacing or conifer release               | Variable – favours some plants over others. Herbicides may impact NTFP species depending on method. Mechanical brushing may improve or reduce NTFPs.   |
|  | <b>Stand Management</b>  |
| Spacing and commercial thinning                    | Can enhance salal where stands are too dense. Salal grown in partial shade has green foliage desired by florists (as opposed to sun spots). Treatment may physically damage NTFPs.   |
| Pruning  | May improve conditions for understory by opening canopy;<br>Conifer boughs can be used for crafts, floral greens and essential oils.   |
| Fertilization                                      | Variable response – changes competitive edge among understory species.   |
| Health Treatments                                  | Chemicals or biocides are of general concern for food chain and products.  |
| Harvest age extended for old growth attributes     | Pine mushroom is dependent upon mature forest cover, and the timber management regime, including soil disturbance, canopy closure and age class.   |
| Biodiversity - Stand structure and landscape level | Seral stage distribution, patch size restrictions, ungulate winter range, riparian management, wildlife tree patches, landscape connectivity and coarse woody debris—all of these biodiversity measures offer more flexibility for NTFP management because they promote diversity across the landscape and at the site level.  |

## Current Regulatory Framework for Forest Practices

As the previous section identified, forest practices can have negative impacts on NTFPs, or they can present opportunities to enhance NTFPs while still meeting timber objectives. Legislation governs how forest practices are planned and carried out to minimize impacts on other forest values.

### Legal Requirements to Address NTFPs

The legislation is in a state of transition from the Forest Practices Code (the Code) to the *Forest and Range Practices Act* (FRPA). FRPA identifies eleven forest resource values—soils, visual quality, timber, forage and associated plant communities, water, fish, wildlife, biodiversity, recreation resources, resource features, and cultural heritage resources—that must be considered when planning and conducting forest practices.<sup>12</sup> Forest practices must be consistent with government objectives for these values.

For each of the values identified in FRPA, government may set objectives in regulation. The *Forest Planning and Practices Regulation* establishes objectives for soils, timber, water, fish, wildlife, biodiversity and cultural heritage resources. The objective for cultural heritage resources is to “conserve, or if necessary, protect cultural heritage resources that are the focus of a traditional use by aboriginal people that is of continuing importance to that people, and not regulated under the *Heritage Conservation Act*.” The *Forest Act* defines cultural heritage resources as “an object, a site, or the location of a traditional societal practice that is of historical, cultural or archaeological significance to British Columbia, a community or an aboriginal people.” Thus, cultural heritage resources will include some aspects of NTFP use by First Nations. No other FRPA values address NTFPs specifically. However, the biodiversity objectives may benefit NTFPs because a diverse forest community will include plant species that are also NTFPs.

In addition to the objectives established in regulation, government may establish expectations for forest values in land use plans and sustainable resource management plans. These in turn can be designated as objectives under FRPA through the *Land Act*<sup>13</sup> NTFPs could potentially be addressed through these mechanisms. (See case study #5.)

FRPA requires major licensees to prepare a forest stewardship plan (FSP), which must be made available to the public for review and comment, and submitted to government for approval. An FSP must include measurable and verifiable results and strategies that are consistent with government objectives for forest values. Although not a requirement

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<sup>12</sup> FRPA Section 149.

<sup>13</sup> These provisions of the *Land Act* have not yet been enacted; however, it is government’s stated intention to do so.

under FRPA, an FSP could also set out results and strategies for NTFPs if a licensee so chooses.

In addition to consulting with the general public, FRPA also requires licensees to make reasonable efforts to meet with First Nations to discuss FSPs. Section 35(1) of the *Constitution Act, 1982*, recognizes the aboriginal and treaty rights of First Nations, which includes the right to gather NTFPs for traditional use. The province is required to meaningfully consult with First Nations about activities on Crown land, including how forest practices may impact First Nations rights to harvest NTFPs.

A current court case before the Supreme Court of Canada is also considering whether licensees have a duty to consult directly with First Nations in that regard (Haida Nation). Those consultation obligations could also extend to the harvest of NTFPs and how it may adversely affect aboriginal and treaty rights. While FRPA does create a new requirement for licensees to discuss proposed forest practices with First Nations, the issue is much larger and more complex than simply consulting on an FSP.

The current regulatory framework does not explicitly require the consideration of NTFPs when planning or conducting forest practices, but it does create opportunities to do so. The most significant of these is the ability for government to establish objectives for NTFPs through sustainable resource management plans and to designate them as FRPA objectives under the *Land Act*. Creating such objectives would then trigger the consideration of NTFP values in forest stewardship plans and in forest practices.



### ***Case Study #5: Kispiox Land and Resource Management Plan – Incorporating Pine Mushroom Habitat***

**Issue:** How can productive pine mushroom habitat be incorporated into forest management?

**Background:** There are mushrooms everywhere in forests; but specific mushrooms are found in specific habitats. The attributes of highly productive pine mushroom habitat have been determined for commercial pine mushroom “hot spots” in BC (Berch and Wiensczyk 2001, Kranabetter et al. 2002).

In the development of the Kispiox Land and Resource Management Plan (LRMP), the traditional use and commercial value of the pine mushrooms were recognized through the public process. The challenge for the Ministry of Forests (MOF) was to set resource objectives for pine mushrooms, and then to incorporate the objectives into timber planning and practices. Because pine mushrooms thrive in older aged stands, an additional challenge was to incorporate the pine mushroom resource objectives into the timber supply harvesting scenarios, in order to reflect the LRMP.

In 1996, the timber supply review analysis needed to model the impacts of maintaining mature forest cover for a longer period than would be required for timber, in order to incorporate the pine mushroom objectives. This could be done with estimates.

In 2001, the forest inventory was improved as far as identifying where and how much pine mushroom habitat might exist throughout the timber supply area (TSA). MOF identified and mapped highly productive pine mushroom habitat in two Small Business Forest Enterprise Program chart areas. This research was extrapolated to the entire TSA, a sensitivity analysis was carried out (Recknell 2001) and then incorporated into the Kispiox Timber Supply Analysis.

**Forestry Implications:** The chief forester’s rationale for the 2003 Kispiox Timber Supply Analysis modelled the following specific management regime for pine mushrooms: one third of projected potential pine mushroom habitat was entirely excluded from timber harvesting, one third was entirely included in the timber harvesting land base, and the remaining third was assumed to be subject to an alternative silvicultural regime with at least 40% basal area retained. This is a start at incorporating LRMP objectives into forest practices and planning.

Better inventory and management information is needed for the pine mushroom. The Ministry of Forests (Skeena-Stikine Forest District) and the Ministry of Sustainable Resource Management are continuing with the habitat mapping work and progress is being made.

## **Opportunities for NTFP Incorporation in Sustainable Resource Management Plans**

Based on public input and/or First Nations consultation, land use plans such as the Kispiox Land and Resource Management Plan (LRMP), the Cariboo-Chilcotin Land Use Plan, the Robson Valley Land Use Plan, and the Kootenay-Boundary Land Use Plan all recognize one or more NTFPs through resource management goals, inventories, research programs and/or management practices (Atwood, 1998).

However, land use plans have tended to be too general to set specific objectives for forest practices. Higher level plan orders were passed by Cabinet to make specific components of land use plans legal requirements, but NTFPs have not specifically been recognized in higher level plan orders. A very significant opportunity for establishing objectives for NTFPs has emerged with the recent development of a single umbrella plan for landscape units, watersheds, local resource uses and coastal zones—the sustainable resource management plan (SRMP).

The SRMP for the West Babine includes objectives, targets and indicators for two locally important NTFPs—berries and pine mushrooms. The SRMP maps important areas for harvest of these products and provides operational strategies to integrate commercial timber harvesting in these areas. Government is in the process of establishing these objectives, targets and indicators as legally enforceable, meaning they will provide operational direction to forest licensees under FRPA.

The Cariboo-Chilcotin Land Use Plan (CCLUP) requires the maintenance and enhancement of wildcraft values, which includes mushrooms, berries, floral and decorative materials and medicinal plants. It requires that key pine mushroom sites be maintained in a condition that promotes mushroom growth, and it requires the maintenance of roaded access for the purpose of harvesting wildcraft. Sub-regional plans, and more recently SRMPs, have been drafted to provide more detailed strategies for implementation of the CCLUP objectives in smaller land units within the CCLUP area. Some of these plans provide objectives and strategies for pine mushroom habitat and access for harvesting wildcraft. However, the strategies focus mainly on conducting inventories and collecting information on the resource and are not as specific to forest practices as those found in the West Babine SRMP. These plans are not legally binding on forest licensees.

SRMPs are undertaken at a scale of planning that may provide sufficient detail to guide forest practices. It is anticipated that SRMPs will translate land use plan objectives from broad, sometimes ambiguous, recognition of resource values into something more meaningful at the operational scale. However, as noted in the CCLUP example, they still may not provide specific direction to guide operations, likely because of the lack of information about NTFPs.

SRMPs are also meant to be demand-driven, with priority given to economic development and implementation of FRPA. SRMPs may focus on single or multiple resource values such as wildlife habitat, biodiversity, rare ecosystems, species-at-risk, old growth representation or cultural heritage resources. A community's desire for economic diversification and growth through sustainable development of an NTFP sector could legitimately trigger the development of an SRMP. The objectives in an SRMP could, in turn, become legal objectives under FRPA, through designation under the *Land Act*, and provide guidance for forest stewardship plans and operational planning for forest practices on the ground.

The West Babine SRMP is a positive example of addressing NTFPs in forest practices and the Board encourages MSRM to continue to use the SRMP approach where appropriate.

## **Information Needs**

In addition to the need for economic data and inventory information on the location and harvest of NTFPs, there is a lack of information on the sustainable management of NTFPs and on compatible management of timber harvesting with NTFPs.

Establishing multiple stand level objectives has been termed “compatible management” in the US Pacific Northwest (Haynes et. al., Kearns et. al). Compatible management produces both timber and another forest value. In British Columbia, some areas such as riparian zones, ungulate winter range, and old growth areas, have primary management objective(s) for non-timber values, with timber as secondary. In British Columbia there are few examples of forest practices with secondary objectives for NTFPs, and rarely examples where NTFPs are the primary management objective. (See case study #6.)

Compatible management opportunities for timber and NTFPs differ with the seral stage, ecological zone, and the NTFP species. NTFP inventories and research are not readily available, and what does exist rarely has information about desirable commercial characteristics, as literature usually discusses species abundance and distribution for other purposes such as wildlife browse (Kerns et al., 2003).

Further, there is very little awareness of NTFPs and opportunities for compatible management among forestry professionals. The FRPA model is based on professional reliance, but most professional foresters and biologists do not have much awareness of NTFPs, let alone formal training and skills in managing ecosystems for NTFPs.

To plan effective forest practices that include NTFPs, the forest manager needs to know:

1. What are the NTFPs of interest, and where are they located?
  - Potential sources of information include field surveys, inventories, traditional and local knowledge and collaboration with any known harvester and buyers.
2. How will the NTFPs react to the options for forest practices?
  - What are potential information sources for literature, retrospective studies, adaptive management projects and new research?
  - What are the costs and benefits of implementing forest practices compatible with NTFPs?
3. Who is responsible for the stewardship and sustainable management of NTFPs?

In the absence of direction from land use plans or known commercial interests, foresters could potentially make some adjustments to forest practices if they had some knowledge of NTFP resource management. It cannot be expected that they will make operational adjustments to forest practices in the absence of sound information.

The NTFP sector also needs knowledge and capacity to better manage, versus simply gather, NTFPs from Crown lands. Both formal and non-formal education, training and extension are required in forest management techniques and how to work effectively with forest managers and other stakeholders. Demonstration projects would assist NTFP users in sharing and acquiring practical skills and techniques.

#### ***Case Study #6: Nisga'a Lands - Integrating Pine Mushrooms into Forest Planning and Practices***

**Issue:** The Nisga'a treaty settlement for all "forest resources" includes timber as well as plant and fungi products. The Nisga'a are placing high importance on the management of pine mushrooms in their forest management planning and practices.

**Background:** Mushrooms, particularly pine mushrooms, are a very important resource for community economic stability in the Nass Valley. Their annual value changes considerably, depending on the quality and quantity of the mushroom crop as well as the daily fluctuating market price. On average, however, the regional commercial sales are around \$5 million per year.

The Nisga'a have developed a botanical forest products plan for eleven species of mushrooms, of which the pine mushroom is the main commercial product. To facilitate this plan, the Nisga'a have established resource management zones within their land use plan.

The mushrooms grow in association with mature pinehemlock timber types. One forest inventory polygon in particular known for its mushroom production has been named “the pine mushroom polygon,” but this is by no means the only place of interest for pine mushroom management.

Nisga’a have longstanding knowledge about where to find prime pine mushrooms areas, as do experienced harvesters. To further sustainable pine mushroom management, inventories are needed to assess the pine mushroom resource and refine boundaries of forest management units where the forest ecosystem can be managed to support and enhance pine mushroom production.

The *Nisga’a Forest Act* enables the Nisga’a Lisims Government to issue permits to pine mushroom harvesters and buyers. Management costs are recovered through permit fees and volume surcharges. Nisga’a forest officers are responsible for enforcing the harvest and buying permits, and together with the experienced pickers they educate harvesters on sustainable harvest practices.

**Forest Practices Implications** Schedule 1 of Appendix H to the Nisga’a Agreement sets out specific, auditable, measurable objectives for the pine mushroom polygon. During the 5-year period of transition to Nisga’a ownership, all forest development plans must comply with the following constraints:

- Timber harvesting, including that associated with roads, will retain a minimum of 80 percent of the forest cover at an age of at least 120 years, and
- Silvicultural systems, other than for areas to be occupied by roads, will be a selection system and provide for retention of a minimum of 70% of the total basal area of the cutblock.

Following the transition period, Nisga’a land use policy states that “no incompatible use will be permitted in areas identified through the assessment process as productive pine mushroom habitat.”

The *Nisga’a Forest Act*, land use plan and botanical forest products plan provide a framework for pine mushroom management, and there are specific, auditable and measurable objectives established for forest development plans. However, logging has not been proposed within the pine mushroom polygon. It is certain that if the mature overstory were logged, the pine mushrooms would be lost. However, the impact different partial cutting regimes would have on the continued production of the mushrooms is unknown and the subject of debate. With this uncertainty, the Nisga’a do not plan to harvest timber in the pine mushroom habitat in the foreseeable future.

## Conclusions

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NTFPs are a significant, but largely unmanaged, forest resource. They present a significant potential economic opportunity for British Columbia. The most recent economic estimates from 1997 put NTFPs' contributions to the provincial economy in the \$680 million range and the industry has undoubtedly grown since that time. However, there is a lack of current data on the importance of NTFPs to the BC economy. NTFPs are also of significant importance to First Nations for traditional and commercial uses.

Government needs to further explore ways of regulating NTFP harvest to create rights of access and use, to develop the commercial sector, to ensure the sustainable harvest of NTFPs and to recognize the cultural and economic importance to First Nations. While some work has been done in this area, no concrete actions have been implemented to date. Further research into what other jurisdictions are doing and pilot projects to test regulatory approaches may be appropriate.

As demonstrated in this report, there are excellent examples of forest managers and NTFP harvesters working together to maximize the timber and non-timber benefits forests can provide. The Board encourages more of these innovative approaches to stewardship and management of all forest resources for the benefit of British Columbians. Success will require further research into the impacts of forest practices on NTFPs and the opportunities for compatible management of these forest resources.

The increased reliance on professionals under the *Forest and Range Practices Act* may lead to innovative approaches to considering and addressing NTFPs within the forest practices planning and operations framework. However, education and training for forestry professionals and NTFP harvesters will be necessary to improve their understanding of the relationship between NTFPs and forest practices, enabling them to identify opportunities and challenges.

FRPA does not currently require forest managers to address NTFPs, but it does establish the framework for government to set objectives for NTFPs under the *Land Act*, through land use plans and sustainable resource management plans, where they are an important local forest resource. Government commitment will be necessary to ensure objectives for NTFPs are established where appropriate, to provide clear direction to operational planning.

Establishing communication between forest managers and the NTFP sector will also be an important factor in ensuring NTFP opportunities are identified and addressed in the planning of forest practices.

The impact of forest practices on non-timber species has been a longstanding concern of First Nations, and the unregulated growth of the commercial NTFP sector exacerbates

First Nations concerns about the sustainability of understory species. The complexity of the issues does not lessen the need for resolution. First Nations rights to NTFPs for traditional and commercial uses need to be recognized and addressed when planning forest practices on Crown lands. Ultimately, they also will have to be addressed by NTFP harvesters in carrying out their activities.

It is too early for the Board to say how FRPA will or will not ensure NTFPs are addressed in forest planning and practices. However, the results-based framework sets the stage for government to establish objectives for NTFPs and for professional resource managers to find creative ways to address NTFPs where they are locally important. This is an issue that the Board will watch as it conducts its work and, if warranted, the Board may issue further reports or make specific recommendations about changes to FRPA in the future.

## Recommendations

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The Forest Practices Board recognizes that a great deal of research and policy consideration has already been done with respect to NTFPs. NTFP management is not a simple issue. However, it does represent a significant economic potential for BC and the issues cannot be left unaddressed in the long term. The Board's role is to promote and encourage sound management and stewardship of all of BC's forest resources, timber and non-timber, and therefore it makes the following recommendations:

1. Government should conduct the research necessary to quantify the current economic contribution of the NTFP sector to the province and its contribution to economic diversification of rural communities. Government should also continue to support and undertake research to develop knowledge about compatible management of timber and NTFP resources, and sustainable management of NTFPs.
2. Government should further explore the options for regulating the NTFP industry in light of:
  - its importance for income and employment;
  - the need for sustainable management of the NTFP resource; and
  - its cultural and economic importance to First Nations.
3. Government should establish objectives for NTFPs under the *Land Act*, through sustainable resource management plans, to guide forest planning and practices where NTFPs are an important local resource for economic and/or traditional uses.
4. Government, the forest industry and professional associations should promote awareness amongst foresters and other resource management professionals, as well as the NTFP sector and First Nations, about the opportunities and challenges of integrating the sustainable management of timber with NTFPs.

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