

Commercial development of salal on southern Vancouver Island

Tom Hobby¹, Kari Dow², and Sara MacKenzie³

Abstract

Salal is a prolific shrub found throughout coastal British Columbia and has been used for centuries by First Nations. Salal berries were used as food, in fresh and dried form, both for subsistence and as trade goods. Although the berries are still harvested by First Nations and others, today the shrub is mainly used as floral greenery. The purpose of this extension note is to summarize the results of a case study conducted in 2005 to describe major elements of the salal industry on southern Vancouver Island, particularly those factors that have contributed to its development as a significant commercial sector, and to address issues that may affect the long-term economic viability of this important non-timber forest product. An estimated 657 726 ha of suitable salal habitat occurs within the South Island Forest District, with an estimated 414 338 ha of habitat located within 1 km of accessible roads. Estimates of the value of annual salal production within the South Island Forest District range between \$6 and \$10 million dollars annually and experienced salal harvesters can potentially earn competitive wages with other occupations requiring similar levels of skill and knowledge. Many opportunities exist for compatible management between salal and timber production, some of which may increase revenues and (or) reduce timber production costs to the landowner. Results of this case study—and research from other areas where the salal industry is well established—suggest that new management strategies may be required to maximize potential benefits of the industry, promote compatible management, and address issues affecting financial viability, livelihood security, and resource conservation in the salal sector.

KEYWORDS: *British Columbia; compatible management; floral greenery; non-timber forest products; salal.*

Contact Information

- 1 Consultant, SCR Management Inc., PO Box 341, Malahat, BC V0R 2L0.
Email: tomhobby@sustainingcreation.com
- 2 Former Research Assistant, Centre for Livelihoods and Ecology, Royal Roads University, Victoria, BC.
- 3 Former Research Assistant, Centre for Livelihoods and Ecology, Royal Roads University, Victoria, BC.

Editor's Note:

Please refer to Mitchell and Hobby (2010; see page 27) in this special issue for a description of the overall non-timber forest product project and details of the methodology employed in the case studies.

Introduction¹

This extension note summarizes the results of a case study conducted in 2005 to describe major elements of the salal industry on southern Vancouver Island, particularly those factors that have contributed to its development as a significant commercial sector, and to address issues that may affect the long-term economic viability of this important non-timber forest product (NTFP).

This case study was conducted within the Coastal Forest Region, and mainly within the South Island Forest District (SIFD; Figure 1). The SIFD covers approximately 1.5 million ha on the southern third of Vancouver Island. Information for the case study was obtained through a review of the available literature, discussions with government and industry sources, and surveys with salal harvesters and buyers. Surveys were conducted between March and May, 2005, and 16 harvester and 4 buyer responses were completed. The surveys were conducted in the Sooke region near the entrance to TimberWest land where harvesters are charged an access permit fee. Surveys were also administered in the northern region near Campbell River. Participation in the survey was voluntary.

We used GIS data to develop a map of predicted suitable habitat for salal production in the SIFD, based on initial understandings of quality habitat requirements. We queried for suitable biogeoclimatic ecosystem classification (BEC) subzones (Fraser et al. 1993), including Coastal Douglas-fir moist maritime (CDFmm) and the Coastal Western Hemlock very wet hypermaritime (CWHvh) and very dry maritime (CWHxm). We also included moderately suitable subzones (Pojar et al. 1991), including Coastal Western Hemlock dry maritime (CWHdm), moist maritime (CWHmm), and very wet maritime (CWHvm). We then merged “forest capability” from the Canada Land Inventory, including only Code Type 1 (very high), and overlaid the two queries with 1-km buffers around roads to reflect probable access to salal resources. All parks and urban development areas were excluded.

This case study describes the major elements of the salal industry on southern Vancouver Island, particularly those factors that have contributed to its development as a significant commercial sector.

Salal (*Gaultheria shallon*) is a prolific understorey shrub widespread across the coastal region of British Columbia (Figure 2). Traditionally, salal berries were an important food and food sweetener for all coastal First Nations (Turner 1995), and were eaten fresh, dried in cakes, and used as a dye. Branches were used to flavour fish soup and for pit cooking.

Commercial harvesting of salal for use as floral greenery began in the early twentieth century. The long-lasting, glossy dark leaves of salal provide structural accent for flower arrangements and quickly became a sought-after staple in the floral industry; salal has been harvested and traded abroad for the last 50–60 years. Estimates indicate the industry in British Columbia alone employs 12 000 to 15 000 people (Wills and Lipsey 1999). The primary markets for salal are found in Europe, although it is also shipped throughout North America and to Japan (Cocksedge 2003).

Over the past decade, numerous factors, including harvesting pressure, have led to reduced quality of the salal product (K. Crompton, pers. comm., 2005). European buyers have ample selection of alternative background filler for floral arrangements, and therefore poor product quality could lead to reduced demand for salal. Results of this case study, and research from other areas where the salal industry is well established (e.g., Hansis 2002; Lynch and McLain 2003; Ballard and Huntsinger 2006), suggest that management strategies may be required to address issues affecting financial viability, livelihood security, and resource conservation in the salal sector (Tedder and Gulati 2007).

¹ Extension notes in this issue of the *BC Journal of Ecosystems and Management* are based on a series of case studies that represent an attempt to document economic, social, cultural, and ecological aspects of important non-timber forest products in British Columbia. For more details on the case studies, please contact the Centre for Livelihoods and Ecology through <http://www.royalroads.ca/cle>. It should be noted that the socio-economic data was largely collected through non-random surveys of harvesters, from interviews with key informants (harvesters and buyers), from direct observation, and from a limited amount of published literature from areas outside the case study region. Survey results are based on the responses of a small number of respondents, and should not be taken as necessarily representative of the larger population. Despite these limitations, the extension notes and the case studies on which they are based present new information on little-known resource sectors and suggest a number of useful and important avenues for future research. Please note that in 2010 the Centre for Non-Timber Resources at Royal Roads University was renamed the Centre for Livelihoods and Ecology.

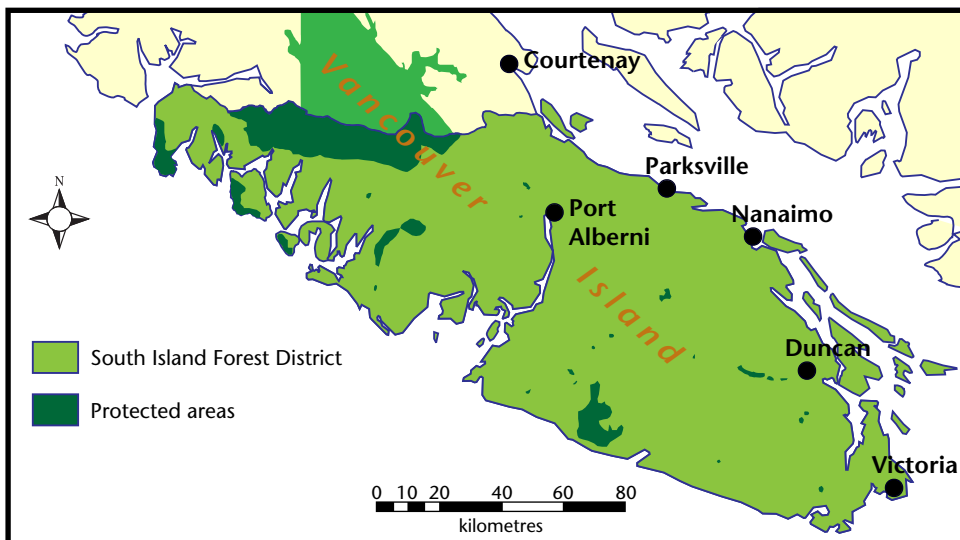


FIGURE 1. The South Island Forest District on southern Vancouver Island, site of the salal case study.



FIGURE 2. Salal (*Gaultheria shallon*).

Overview of salal

Salal is an erect perennial evergreen shrub belonging to the Ericaceae family. Depending on growing conditions, plants can reach 0.2–5 m in height. Salal leaves are thick, leathery, and shiny in appearance with an oval shape

and finely toothed leaf margins. They taper at the tip and reach lengths of 5–10 cm. When young, the stems are greenish-red, but develop a woody appearance by the age of 3–4 years. Salal produces small, bell-shaped pink flowers from March through June, fading to white as they age. Salal berries begin to ripen in August, deepening to a black, reddish-blue, or dark purple colour, between 6–10 mm long (Pojar and MacKinnon 1994; Derig and Fuller 2001; Cocksedge and Titus 2006). A rhizomatous plant that spreads both through seed dispersal and vegetatively, salal matures to harvesting quality within 5 years of germination and takes approximately 2–5 years to recover after harvesting.

Salal is one of the most common indigenous shrubs in coastal British Columbia, occurring along the Pacific coast from southern California to southern Alaska (Derig and Fuller 2001) and growing inland as far as the Coast and Cascade mountains except for a small pocket population on Kootenay Lake in interior British Columbia (Pojar and MacKinnon 1994; Turner 1995). Salal is found at low to medium elevations, from sea level up to approximately 800 m (Fraser et al. 1993). As widespread as salal is, it is relatively difficult to find large patches that meet commercial quality criteria, given the adaptability of salal's morphology to habitat combined with commercial harvest pressures.

In British Columbia, salal is wild harvested primarily from forests on Vancouver Island and the Sunshine Coast. Collection of salal stems and leaves typically lasts 9–10 months, commencing at the end of

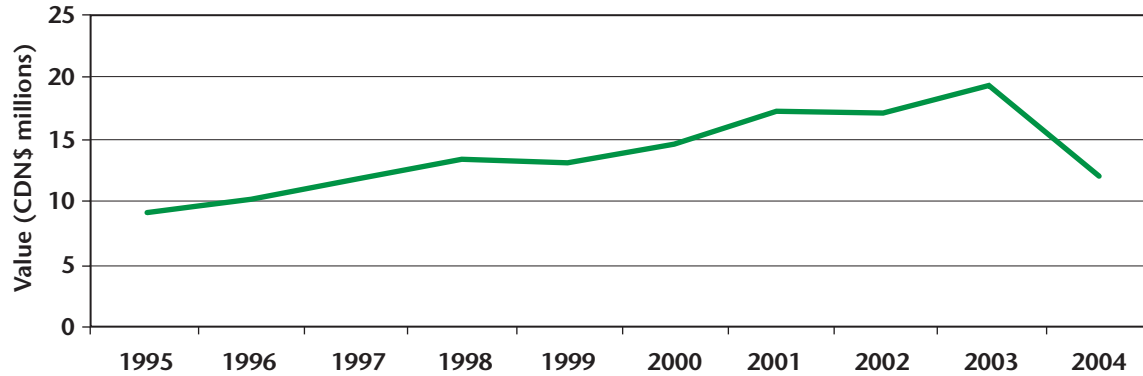


FIGURE 3. Export values of Canadian floral greens to Holland, 1995–2004.

August and continuing until April, when new growth begins. The plants are left for the peak growing season until the leaves have hardened off and the colour has turned a dark green (Cocksedge 2003). The collection of salal requires minimal equipment. Pickers snap off stems by hand to collect the marketable branches and leaves. More experienced pickers may also manage the salal stand by removing old and defective stems and branches, allowing new branches to grow. Harvesters gather the stems into a “bunch” (also called a “bundle” or “hand”) and secure the bunch with an elastic band. Different stem lengths are requested by the floral industry: the “longs” (also called “regulars”) are 66–76 cm long; “tips” are 46–61 cm long, and “bouquet tips” are 20–25 cm (Cocksedge 2003). Most of the harvesters surveyed (81%) take their pick to the buyer on a daily basis, but some aggregate their harvest first as it is easily stored in a cool dark place without refrigeration.

Salal market profile

The industry infrastructure for salal is typically a mix of smaller first-order buyers (the first level after harvesters in the marketing chain) who then sell to larger second-order traders, and larger processors who sell directly into both the domestic and global export markets. Total retail/export sale average is estimated at between \$6.5 million and \$10.5 million annually for the SIFD, which represents 20–30% of total British Columbia salal production.

Domestic market

Quantities and values of salal and other NTFP floral commodities sold domestically are estimated to range between \$2 and \$5 million dollars per year (Hobby et al. 2006), with salal representing a majority of this figure. To derive this figure, domestic wholesalers were interviewed and sales tracked through the United Flower Growers Co-operative Association in Burnaby, B.C., which hosts weekly auctions of floral products, including NTFPs. The 2003–2005 annual sales from the auction ranged from \$503 000 to \$720 000 for over 65 NTFP floral commodities with salal accounting for between \$73 000 and \$140 000 of that figure per year. The Burnaby auction represents only a small portion of the total domestic floral market (there is a similar floral auction in Ontario).

Export markets

The majority of salal is exported to Europe with the floral auctions of Holland as the main destination. Holland is a major distribution point for the global floral industry. Export values are shown in Figure 3.²

Farm gate prices reported from the 2005 harvesters’ survey ranged from an average of \$1.28 in the fall to \$1.64 in the spring for hands of longs, and from \$0.94 in the fall to \$0.65 in the spring for tips. When harvesting begins in the fall, salal is first shipped by air to the European market and receives a market premium in the early market window; however, whereas early shipments are sent by air, shipping

² The export figures are shown for all floral greens as there is not a specific harmonized code for salal. It is estimated that salal represents 70–95% of these totals.

containers are simultaneously shipped by sea at a lower cost per unit, and when these containers arrive in Holland approximately 2 months later, a flood of supply typically occurs that causes prices to drop significantly. As spring advances, prices increase as supplies diminish and buyers stock up supplies for the period of unavailability during the spring–summer peak growing season when salal is not harvested.

Salal stems exported to the American market are primarily longs, whereas most of the tips are sold to Europe. The declining availability of longs over the past decade has potential market implications; if this decline continues, a significant market niche will be lost and export levels will drop. In addition, an oversupply of tips may flood the market and cause price drops leading to price levels that harvesters are unwilling to accept.

Overall, trade to Holland has risen over the last decade, with the exception of 2004 when Canadian imports dropped substantially. This 2004 decline may have been due to substitute products, quality issues from Canadian suppliers, or to the rising value of the Canadian dollar, which was mentioned by buyers as having negative implications for the industry. Experts have commented that this was an anomaly, and that trade in salal will generally remain stable or increase due to its excellent shelf life and steady demand.

Global economic issues

The rising value of the Canadian dollar in relation to the United States dollar and the Euro has made Canadian exports of salal more expensive for importers. It may also have significant trade effects as consumer price points for florals are reached and salal becomes less competitive than other substitute products. Future salal exports may be at risk from cheaper substitute products if the Canadian dollar remains strong.

The industry

Harvester profile

Harvesters were generally unwilling to complete the surveys and the researchers found that some harvesters were suspicious of how the information would be used. A similar reluctance was found with surveys for wild berries and mushrooms conducted for this study. Language barriers also inhibited data collection.

Among harvesters contacted in the south Vancouver Island region, 16 respondents completed

the harvester's survey. Both male and female harvesters were represented. Harvesters often work as couples and in small groups, sharing transportation to the woods. The harvesters interviewed appeared to be between 30 and 50 years old. Over 80% of the salal harvesters interviewed also harvested other NTFPs, such as cedar and pine boughs, berries, and morels. Some worked seasonally on oyster and shellfish farms and picked salal the remainder of the year.

Seven harvesters picked on private lands and paid a daily permit fee; however, in some of the harvesting areas in the more northerly parts of the SIFD, forest companies lock gates, closing the area to salal harvesters. This put additional harvesting pressure on the remaining accessible areas within the region.

Harvesters reported harvesting between 9 and 10 months per year (August to April), which was similar to that found by Cocksedge (2003). Calculations based on an 8-hour workday, and harvesting work carried out 5 days per week for 43 weeks per year, suggest that an experienced full-time harvester could potentially gross more than \$33 000 annually, less estimated non-labour expenses of approximately \$3,000. By comparison, forestry, mining, and aquaculture/fisheries workers have an estimated average wage ranging from \$16 to \$25 per hour with average annual salaries ranging from \$28 800–\$45 000 (Service Canada 2006). Salal harvesting thus may offer similar returns of approximately \$19.50 per hour. It should be noted, however, that salal harvesters do not receive employee benefits and that salal harvesting is a part-time occupation for many. Further, the income estimate above does not include travel time and time spent locating new patches, which can be significant. Income is taxable but the sector is largely unmonitored, particularly at the harvester level.

Wills and Lipsey (1999) estimated that the floral greenery sector employed 12 000–15 000 people on a full-time or part-time basis. As salal harvesting represents approximately 90% of this sector, their estimate suggests that approximately 9000–14 250 salal harvesters operate in British Columbia. The study region's contribution to total salal harvest and production is estimated to range between 20 and 30% of the provincial total. If these figures are somewhat representative, then an estimated 2250 salal harvesters could operate in the southern Vancouver Island region. In the absence of better data, it is not possible to document or predict trends in the salal industry labour force. Tedder and Guleti (2007:40) noted, however:

[I]ndustry sector respondents indicated that finding workers is difficult and there is significant concern about who will replace the current workforce as it ages and no longer has the necessary stamina and strength to harvest salal. Attracting a younger workforce has been affected by a strong economy and growth in other sectors. In addition, the harvest of salal is dominated by immigrants who are on the fringe of the workforce for skill and/or language challenges, and who tend to have greater difficulty integrating into the Canadian workforce. The dream for these harvesters is to create a better life for their children and to see them enter more mainstream sectors.

Buyer profile

An estimated 36 buyer/distributors and buyer/exporters operate in British Columbia. Some of the larger buyer/distributors are first-order traders who are mainly agents for large United States-based exporters. Only four buyer/processors in the study region agreed to be surveyed.

Salal buyers typically take the raw product and repackage the longs and tips into boxes with approximately 20 hands of longs and 25 hands of tips per box, weighing approximately 20 kg. Once packed, buyers typically refrigerate the salal in a cooler at 1°C before putting into a 12² m shipping container, or if the product is going by air freight, in cardboard boxes. Buyers surveyed in the region shipped between 4000 and 20 000 hands per week.

Salal harvest and implications for sustainability

Natural productivity of salal

A majority of harvesters surveyed felt harvesting an area would not deplete salal production if stems were picked properly and the area was not affected by logging; however, the salal harvesters interviewed believed that logging practices do affect the quality and quantity of salal and expressed great concern over the effects of logging on the resource.

Some harvesters surveyed noted a decrease of harvestable salal when they returned within a year to a harvesting site; however, a majority reported an increase in harvestable stems when returning to a site after 1 year. All respondents felt that salal harvesting had a neutral effect on the ecosystem and most of the respondents stated that a 2–5 year rotation between salal harvests seemed to be appropriate for maintaining sustainable production.

A study on southern Vancouver Island found that salal biomass regrowth in a commercially harvested salal plot was significantly greater than in the undisturbed control plot after 1 year (Cocksedge and Titus 2006). The study also showed that the annual increment of new, above-ground growth in salal—that is, the length of the new branches—was not significantly different in control plots when compared with plots where salal harvesting occurred. These results indicate that proper salal harvesting may not negatively affect future salal growth; however, the authors cautioned that this study examined only one harvest area during 1 year.

The GIS results from the study suggest that the SIFD contains an estimated 657 726 ha of predicted suitable salal habitat, based on initial understandings of habitat requirements. Calculations that combined suitable habitat with accessible lands within 1 km of existing roads in the region yielded an estimate of 414 338 ha of land suited for salal harvesting, but the density and quality of patches depend highly on site series and seral stage, neither of which we were able to include in the GIS queries because of the high proportion of private lands and the inability to access this information. Therefore, the actual areas of suitable habitat for commercial quality salal is likely significantly less.

Predicting areas of market-quality salal is difficult as abundance is not an adequate indicator of commercial quality. Mapping of suitable habitat combined with field checking will lead to better estimates of potential salal production in the future.

Compatible management potential

Forest canopy cover levels directly influence the productivity, density, biomass, cover, and stem size of salal. Optimal conditions for commercial quality salal are partial shade and well-drained, nutrient rich soil (Cocksedge 2003). The partial shade is required for salal to produce the desired commercial characteristics; too little light results in lanky, unproductive shrubs, and too much light leads to short, tough stems often with discoloured leaves. For example, salal located in clearcuts produces small, thick leaves of little commercial value (Cocksedge 2003).

Managing the forest canopy can enhance the habitat for commercial quality salal, particularly through manipulations that affect light levels. It is estimated that the value of salal can be increased from \$200 to \$500 per hectare by thinning a Douglas-fir stand from a 90% to a 75% canopy cover (B. Titus, unpublished data).

Planting western redcedar may prolong the window for commercial quality salal because of its relatively open canopy. In addition, cutting patterns that increase the length of stand edge can leave enough shade to provide habitat for quality salal for years (Gagné et al. 2004).

Salal also responds positively to fertilization. Fertilizing young stands and increasing pruning as the stand ages can increase the value of salal to up to \$10 000 per hectare when harvested every other year (B. Titus and W. Cocksedge, unpublished data). The impacts on salal production associated with fertilization require further exploration.

Institutional and policy environment

The provincial government has not implemented any legislative or policy measures to manage the salal resource as a commercial sector in British Columbia. Although salal harvesting has provided income opportunities for residents of resource-dependent communities, the absence of a management system means that volumes and values for salal are not regularly reported. Thus, the contribution the salal resource makes to the provincial economy cannot be accurately assessed (Tedder and Gulati 2007).

The provincial government has exhibited little interest in implementing regulatory changes. Unresolved issues relating to the rights and title of First Nations has also had implications on the potential implementation of management regimes for salal and other resources. Tedder and Gulati (2007) noted that the salal industry itself has shown little appetite for the introduction of regulatory measures. In the absence of requirements or pressure from either the government or the salal industry, the timber-dominated forest industry has, understandably, demonstrated little interest in salal management.

A joint project was undertaken by the Centre for Livelihoods and Ecology, the provincial government Interagency Non-timber Forest Resource Committee, and Natural Resources Canada to expand the current harmonized code system³ used for all floral greens to include an extension specific to salal. Whereas the application was accepted by Statistics Canada, the request to create new codes was denied by the U.S. Census Bureau because of a perceived insufficient level

of trade and other factors. Without agency support in the United States, the project could not proceed. If the application had been successful, more accurate trade data could be collected potentially making it easier to build a case for salal management and policies in the future.

Land tenure issues

Private forest landowners possess rights to salal as they do to other forest resources. Some private landowners on Vancouver Island have taken steps to limit access to salal resources on their property; in some cases, vandalism has led landowners to restrict all access and erect gates and barriers to keep harvesters out (R. Ross, pers. comm., 2006). In other instances, companies have set up a system of permits to restrict access to those harvesters willing to pay a small fee. In both cases, trespass continues to be an issue because of the high costs associated with adequately patrolling large tracts of land.

On Crown land, only a few forest tenures, such as Community Forest Agreements and the First Nations Woodland Licence (still under development at time of writing), grant rights to manage and benefit from botanical forest products. However, these rights do not extend to the exclusion of other users, likely rendering them ineffective in encouraging investments in management or resource development.

Any management regime contemplated for salal will need to address multiple aspects of the current salal industry including lack of investment in the resource, the potential for over-exploitation, road closures and other measures that limit access by harvesters, and the absence of communication and organization among and between resource users and forest managers.

Development possibilities

Production and harvesting

With large tracts of private land on southern Vancouver Island, salal buyers may benefit by exploring exclusive harvesting agreements with landowners. Such arrangements exist or have existed in the past.

³ The harmonized code system is a global trade code system used to track values and volumes of commodities traded internationally. Statistics Canada is the Canadian authority to amend these codes and accept new code classifications as deemed appropriate. In the case of salal, the approval of a new code is in conjunction with the U.S. Department of Commerce.

Salal production on private lands could move to a “forest farming” system that should improve production quantity and quality through the adoption of compatible management methods.

Salal production on private lands could move to a “forest farming” system that should improve production quantity and quality through the adoption of compatible management methods. Salal production has been estimated to produce an average of \$1000 per hectare per year on the Pacific Northwest coast and recent agreements in the United States Pacific Northwest have provided forest landowners \$25 per hectare rents from salal agreements with regional floral companies (N. Schaaf, pers. comm., 2007). At these values, salal buyers could collaborate with timber companies to perform silvicultural stand management functions (i.e., thinning, pruning). This arrangement could reduce timber production costs by generating additional income from salal licensing. On Crown land, more challenges may exist to implementing salal management. Land tenure changes may include issuing NTFP rights to small tenures such as provincial woodlot licenses, and potentially working with First Nations who gain treaty lands in the future. Large timber licensees may also be able to develop overlapping tenure agreements in the future, providing salal buyers with exclusive areas to manage for salal within a tree farm licence or timber supply area; however, such arrangements would require significant changes in tree farm licence or timber supply areas, as well as additional incentives to pursue joint resource management. Changes to tenure arrangements could also face significant resistance from other forest resource users, including NTFP harvesters.

Industry organization

The development of a salal association or a broader NTFP association could provide an opportunity to focus research efforts, provide education and extension services for salal harvesters and forest managers, and possibly assist producers to capture more value through improved marketing approaches and consolidation of shipments. Additionally, compulsory

provincial licensing of salal buyers and exporters would allow for better tracking of salal production (Hobby, unpublished data). Licence fees could be used to foster industry development, support research, and enhance management of the resource.

Conclusions

This case study highlighted the following key factors, which have contributed to the long-standing commercialization of salal in the southern Vancouver Island region.

- Potential ample supply of salal resources within the region.
- Product with a long shelf life, allowing export markets to be developed and quality levels maintained for shipping over long distances.
- Well-established transportation network enabling access to salal resources and subsequent transport to buyers.
- Willing and able labour force to serve as producers.
- Financial returns to producers, with comparable incomes to that which could be earned in the region with similar levels of skill, knowledge, and experience.
- Long growing season allowing harvesting over much of the year.
- Low barriers to entry and few capital expenses to become a producer.
- Relatively low skills required to become proficient at the trade.
- A well-established harvest to market system that has been functioning for over 50 years.
- Lack of government restrictions on salal harvesting and exports and therefore no permit costs or requirements (note that this could conversely limit access through open-access competition and potential over-harvest).
- Relatively fast growing and dependable species that allows short rotations for harvesting and a relatively sustainable supply of the product.

Conservation of the quality (if not the quantity) of the salal resource and the financial viability of the industry are, however, both issues of concern. Market challenges, including the high value of the Canadian dollar and changing consumer preferences may reduce export markets for salal. Given the present lack of either requirements or inducements to foster

salal production on Crown land, and the fact that very few arrangements are in place between private landowners and salal harvesters to better manage the resource, compatible management opportunities and methods of enhancing salal production are not being implemented. As argued by Tedder and Gulati (2007), government needs to actively collaborate with industry representatives at the harvester and buyer/distributor levels to increase the level of information about all aspects of the sector, to assist with product quality issues and market labelling, and to reduce the transaction costs associated with sector organization and co-operation.

Note

This series contains information on the ecology and management of non-timber forest products. In promoting implementation of this information, the user should recognize the importance of equitable sharing of any benefits derived from the management and use of this resource as addressed in Article 8(j) of the United Nations Convention on the Conservation of Biological Diversity.

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References

Ballard, H.L. and L. Huntsinger. 2006. Salal harvester local ecological knowledge, harvest practices and understory management on the Olympic Peninsula, Washington. *Human Ecology* 34:529–547.

Cocksedge, W. 2003. Social and ecological aspects of the commercial harvest of the floral greenery, salal (*Gaultheria shallon* Pursh; Ericaceae). MSc thesis, University of Victoria, Victoria, B.C.

Cocksedge, W. and Brian D. Titus. 2006. Short-term response of salal (*Gaultheria shallon* Pursh) to commercial harvesting for floral greenery. *Journal of Agroforestry Systems* 68(2):103–111.

Cocksedge, W. and T. Hobby. 2006. Critical information for policy development and management of non-timber forest products in British Columbia:

Conservation of the quality of the salal resource and the financial viability of the industry are both issues of concern.

Baseline studies on economic value and compatible management. Centre for Non-Timber Resources, Victoria, B.C. Executive summary. http://www.for.gov.bc.ca/hfd/library/FIA/2006/FSP_Y061065a.pdf (Accessed October 2010).

Derig, B. and C. Fuller. 2001. *Wild berries of the West*. Mountain Press Publishing Company, Missoula, Mont.

Fraser, L., R. Turkington, C.P. Chanway. 1993. The biology of Canadian weeds. *Gaultheria shallon* Pursh. *Canadian Journal of Plant Science* 73:1233–1247.

Gagné, J., W. Cocksedge, B. Titus, R. Winder, P. Burton, A. Thompson, S. Berch, S. Tedder, M. Keefer, W. Fekete, and G. Prest. 2004. Integrating non-timber forest products into forest planning and practices in British Columbia. Forest Practices Board, Victoria, B.C. Special Report No. 19. <http://www.fpb.gov.bc.ca/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=3058> (Accessed October 2010).

Hansis, R. 2002. Workers in the woods: confronting rapid change. In: *Non-timber forest products in the United States*. E.T. Jones, R.J. McLain, and J. Weigand (editors). University of Kansas Press, Lawrence, Kas. pp. 52–56.

Hobby, T., D. Mitchell, S. Tedder, A. McBeath, and S. Wang. 2006. Economic-subcomponent: Current estimates for NTFP Values in British Columbia, information gaps and recommendations for future management and policy. In: *Critical information for policy development and management of non-timber forest products in British Columbia: Baseline studies on economic value and compatible management*. Centre for Non-Timber Resources, Victoria, B.C.

Lynch, K.A. and R.J. McLain. 2003. Access, labor, and wild floral greens management in western Washington's forests. U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station, Portland, Oreg. General Technical Report PNW-GTR-585.

Mitchell, D. and T. Hobby. 2010. From rotations to revolutions: Non-timber forest products and the new world of forest management. *BC Journal of Ecosystems and Management* 11(1&2):27–38. <http://jem.forrex.org/index.php/jem/article/view/58/22>

Pojar, J. and A. McKinnon. 1994. *Plants of coastal British Columbia*. Lone Pine Publishing, Vancouver, B.C.

Service Canada. 2006. Vancouver Island and Coast Labour Market Bulletin. <http://www1.servicecanada.gc.ca/en/bc-yk/5621/jwtc/lmi/lmr1q06.shtml#1> (Accessed August 2007).

Tedder, S. and S. Gulati. 2007. Open access, common pool resources and government intervention: An evaluative model for government intervention and a case study of the commercial harvest of salal in British Columbia. B.C. Forest Science Program, Victoria, B.C.

Executive Summary, Project No. Y071311. http://www.for.gov.bc.ca/hfd/library/FIA/2007/FSP_Y071311a.pdf (Accessed October 2010).

Turner, N.J. 1995. *Food plants of coastal First Peoples*. University of British Columbia Press, Vancouver, B.C. Royal British Columbia Museum Handbook.

Wills, R.M. and R.G. Lipsey. 1999. An economic strategy to develop non-timber forest products and services in British Columbia. Forest Renewal British Columbia Research Program Grant No. PA97538-ORE. <http://www.for.gov.bc.ca/hfd/library/frbc1999/FRBC1999MR30.pdf> (Accessed October 2010).

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Test Your Knowledge . . .

Commercial development of salal on southern Vancouver Island

How well can you recall some of the main messages in the preceding Extension Note?

Test your knowledge by answering the following questions. Answers are at the bottom of the page.

1. Based on this article, what are two methods of enhancing the value of salal within a forest stand?
2. Based on this article, what are the implications of the lack of regulation or monitoring of the salal industry?
3. The income that a full-time salal harvester can generate, when compared to similar level salaries within other natural resource industries, is:
 - A) Much lower, on average
 - B) Significantly higher
 - C) Comparable but without benefits

ANSWERS

1. *Managing the forest canopy by thinning, pruning, planting western redcedar, or increasing stand edges, and fertilizing young stands.*
2. *Overharvest and decreased quality of salal; lack of information on the industry and its potential contribution to the British Columbia economy; lack of stability within the industry; and inability to capture full value of the resource.*
3. C