

Commercialization of Wild Berries in British Columbia: Prospects, Current Problems and Future Solutions

(Project #AF014-A207)

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May 2009



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Funding provided by:



EXECUTIVE SUMMARY

This report is phase I of the research project entitled “Characterization of nutraceutical properties of BC wild berries and small fruits and setting up quality control parameters for value added products”.

Using existing literature and interviews with individuals involved with the collection of wild berries or other non-timber forest products (NTFP), the goal of this report was to present an overall view of the present wild berry industry and outline the actions that need to be taken before it can become a profitable, commercial industry.

Five potential markets for wild berries were identified. Wild berries could be successfully marketed as natural health products, value-added ingredients, specialty and premium ingredients, raw materials, functional beverages and functional cosmetics.

Several common berry species in BC were described according to growing areas, harvest season and market potential. The market potential was based on the potential harvest quantities and took into consideration competition from commercial crops and European varieties. The species identified as having the most potential for commercialization were; Saskatoon berry (*Amelanchier alnifolia*), Oregon grape (*Berberis aquifolium*), Hawthorn berry (*Crataegus douglasii*), Black huckleberry (*Vaccinium membranaceum*), Elderberry (*Sambucus spp.*) and Soapberry (*Shepherdia canadensis*).

The current market for wild berries was outlined, describing their use in cottage industries, local sale at farmer’s markets and to restaurants, use in alcoholic beverages and sale of raw materials in bulk.

Some of the barriers preventing the commercialization of wild berries in BC were outlined. The most significant problems were identified as; lack of baseline data, issues with land ownership, quality assurance, supply and storage of wild berries, coordination of Forestry activities with collection of wild berries, competition with commercial crops and European varieties and finally, conflicts with First Nations’ food sovereignty. Current solutions or potential solutions to each of these problems were proposed. Concerns suggested by local individuals were described, which centred mainly on the issue of sustainability. Finally, past and current research efforts were outlined followed by future goals for the sustainable harvest of wild berries.

ACKNOWLEDGEMENTS

I would like to thank the various organizations and individuals who participated in this study to make it a success. My special thanks also to Jeannette Lee from the West Kootenay Herb Growers Cooperation for sharing her hands-on experience and expertise. I would also like to thank the members of the wild berry harvesting community who informed me of the many issues facing those who wish to make a living from the responsible harvest of wild fruits from BC forests. Finally, thank you to Tim Brigham from Royal Roads University for his time and valuable contributions. This research was funded by Investment Agriculture Foundation of BC.

Cover photos by Lisa Hilbrecht

ABSTRACT

Using the information gathered through interviews with members of the wild berry harvesting community of BC in addition to available literature, the current state of the wild berry industry was profiled. A list of berry species commonly harvested in BC was compiled, outlining the growing areas and market potential of each species. The current wild berry market was summarized, followed by a review of the problems facing the commercialization of the wild berry industry. Concerns raised by local communities in which these wild berries are harvested were also outlined. A description of ongoing projects addressing these concerns was provided in addition to a number of future goals for overcoming the problems encountered in commercial utilization of wild berries in BC.

1.0 Introduction

Wild berries have been a part of British Columbia's culture and heritage for thousands of years. They were, and still are, highly regarded by the First Nations' community both for their health benefits and for their value as a food source. With the recent public movement towards healthier, more natural, local food sources, wild berries have received a lot of attention by many diverse industries. Currently the market for wild berries is almost entirely limited to cottage industries. Individuals harvest their own berries for personal use, or for sale at local farmers markets in raw form or processed into jams, jellies, syrups or baked items. There are very few examples of individuals who have based their businesses exclusively on the use of wild berries. Some examples include Kermodé Winery in the Fraser valley that uses wild berries to make alcoholic beverages and Wildberry Wholesome Foods in Prince George that uses wild berries to make jams and jellies (Burton, 2006).

Despite the current state of the market, there appears to be a growing interest in commercialization of the wild berry industry. The inherent nature of a wild harvested product provides unique problems for commercialization. Several key issues include; land access, First Nations' rights, inclusion of local species in the natural health products registry of Canada, coordination of berry harvesting with forestry activities, and competition with more developed and organized wild berry industries in Europe.

In addition to the problems faced by Canadian industry, there are also concerns about how harvesting wild berries on a large scale will affect the local communities in which these berries grow. The issue of sustainability is a huge concern, as people have seen their natural resources exploited and depleted in the past; for example, harvest of Cascara bark and Pacific Yew (Turner, 2001). First Nations' communities are concerned about how commercial harvest will affect their cultural traditions and food supply.

There are many programs that need to be initiated and many issues that need to be investigated before commercial harvest of wild berries can thrive as a profitable and sustainable industry. These issues pertain not only to wild berries, but also to all other non-timber forest products (NTFP). NTFP have been investigated by many prominent figures in

the scientific community and the general consensus is that more research needs to be done before NTFP can be considered commercially viable resources. Information needs to be collected about the affects of harvest on local wildlife, potential harvest quantities, and affects of forest-management practices on NFTP. Also, a detailed inventory of baseline values for each species needs to be compiled so changes can be measured accurately.

This report was prepared with the intent of outlining existing ideas as well as proposing new ideas to help move forward with commercialization of the wild berry industry.

2.0 Potential Markets

In order to commercialize BC wild berries, it is important that they can be marketed to a number of different industries. The way in which they are marketed will have a significant influence on the price they will command and the quality and quantities that will be expected. In consulting with individuals involved in marketing and research and development at Natures Formulae Health Products Ltd. and with individuals involved in the wild berry industry, several potential markets were identified.

Natural Health Product

There are several berries already classified as natural health products by the natural health products directorate (NHPD) of Canada. These species are mostly European varieties that have health benefits supported by long-standing traditional use and extensive characterization studies outlining their phytochemical content. European blueberry (*Vaccinium myrtillus*) and elderberry (*Sambucus nigra*) are two such examples. Several of these species have North American counterparts with similar health benefits and characteristics. These berries could be marketed as natural health products and sold as supplements. If prices were comparable, consumers would likely embrace a local version of their favourite supplements.

Although this market has strong potential, there are considerable barriers associated with marketing a wild berry as a natural health product. Before NHPD will accept a species for inclusion as a natural health product it must be supported by detailed and comprehensive characterization studies as well as documented traditional use by groups such as the First Nations. Performing these characterization studies requires a large investment of time and money. Individual companies often do not have the resources to fund these studies, so

research grants and the involvement of universities and the scientific community is essential for this marketing strategy to be implemented.

Value-added ingredient

One way to avoid the labour intensive and lengthy process of getting a species classified as a natural health product is to market it for its phytochemical and nutritional content. As the second phase of this project, the physiochemical and nutraceutical characteristics of BC wild berries were quantified. Using data such as these, including previously completed research, wild berries can be marketed as valuable additions to different foods and beverages. The modern fascination with anti-oxidants and so called “super fruits” provides strong evidence that this marketing strategy could have great potential for BC wild berries. Companies are always looking for the next new ingredient and the unique and diverse species of wild berries in BC would likely attract this business. Examples of companies already successfully employing this marketing strategy include Kermode Winery and Okanagan Sprits, both of which use wild berries to produce specialty alcoholic beverages.

Specialty and Premium Markets

There are additional costs associated with gathering wild berries that are not associated with harvesting conventional crops. People must travel to the growing areas and spend their time and energy searching for and hand-picking the berries. They often have to camp out in the forest during the harvest and store and transport their harvested berries back into town. This is not a problem for those who collect berries as a recreational activity or for personal use, but if one wants to profit from this activity, these costs must be offset by charging a premium price for the berries. While this market will be small and limited, we believe it is possible for wild berries to be sold to high-end restaurants or bakeries as a premium raw ingredient. Being able to highlight the use of local, wild fruit in a dish or baked good would justify charging a higher price for a finished product.

Functional Beverages

The addition of wild berries to functional beverages has great market potential. The current consumer market is embracing functional beverages as an easy, convenient way to get essential nutrients and vitamins. Youth Juice™, sold in Canada and the United States,

commands a price of \$60.00CAD per 950ml bottle. This product was designed to be produced using wild berries, depending on availability and regular supply. It is marketed for its nutritional and health benefits. Medical doctors have prescribed it to patients with asthma, pain and inflammation. The success of this product in the North American market provides strong evidence that consumers are interested in berry products and are willing to pay a premium price for them. Although there is a growing demand for wild berry-based functional beverages in the local and international markets, the growth of the industry is hampered by the short supply of high quality wild berries and the uncertainty regarding their availability.

Functional Cosmetics

Of all the marketing ideas, this was identified as the most relevant and exciting. Anti-aging products have all but taken over the cosmetic industry. Among the most widely recognized and accepted functional ingredients shown to slow the aging process are antioxidants. Many wild berry species are very high in antioxidants, showing high values of phenolics, tartaric esters, flavonoids, flavenols, and anthocyanins (Hilbrecht, Ranatunga, Oomah, Godfrey & Li, 2006). Phenolics have been shown to have strong antioxidant effects, scavenging free radicals that are proposed to cause aging (Mikkonen, Määttä, Hukkanen, Kokko, Törrönen, Käärenlampi and Karjalainen, 2001). Including wild berry ingredients in cosmetic products would allow companies to advertise the antioxidant levels and therefore anti-aging properties of their products. In addition to antioxidants, many berry species contain vitamins and other potentially beneficial ingredients. Further studies are needed to determine the exact constituents of each berry species. Cosmetics can include, but are not limited to, lotions, eye serums, facial toners, sunscreens, lip balms, hand and nail care, hair-loss prevention products and hair and scalp care. The oils of wild berry seeds are also highly valued for their neutraceutical and cosmeceutical properties. Further studies are needed to determine the various cosmeceutical benefits such as anti-collagenase, anti-inflammatory and UV protection activities of wild berry extracts.

3.0 Wild Berry Species in B.C

Table 1 presents a selected list of wild berry species that grow in BC. This is not a comprehensive list, but does include the berry species that are most commonly harvested in

the province. These data were collected using the references listed in addition to interviews with individuals involved with berry picking endeavours in BC.

Table 1 – A sampling of wild berry species found in BC including Latin name, common name(s), growing areas, harvest season and market potential of each (Cocksedge & Schroeder, 2006; Parish, Coupe & Lloyd, 1996; Tilford, 1997; Turner, 1975).

Latin Name	Common Name(s)	Growing Areas	Harvest Season	Market Potential
<i>Actaea rubra</i>	Baneberry	Found at low to sub alpine elevations. Grows in moist, shaded forest and on riverbanks and clearings. Must be in at least partial shade.	Blooms late spring to early summer. Bears fruit from August to first frost.	Fruit is poisonous. Potential for cosmetic use.
<i>Amelanchier alnifolia</i>	Saskatoon Berry	Found at low to mid elevations. Grows in moist, wooded hillsides, on riverbanks and on open hillsides with well-drained soil. Common all over BC.	Blooms April to June. Bears fruit from July to August.	Potential for large harvest quantities. Current market for consumption only, but potential for use as food supplement or cosmetic.
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick (Bear berry)	Found from sea level to alpine elevations. Grows in open forest, clearings and on dry slopes in well-drained soil.	Blooms April to June. Bears fruit from July to August.	Very labour intensive to harvest. Limited yield. Leaf used for its skin-whitening properties.
<i>Berberis aquifolium</i>	Oregon Grape (Tall)	Found at low to mid elevations. Grows in open, dry, rocky areas and in coniferous coastal forests up to timberline. Mainly found in southern part of BC.	Blooms May to July. Bears fruit from August to September.	Potential for large harvest. Contains high levels of natural pectin, making it useful for jam/jelly preparation. Berry not palatable. Roots recognized as a natural health product (NHP).
<i>Cornus canadensis</i>	Bunchberry	Found at low to sub-alpine elevations. Grows in moist coniferous forests, especially in logged areas on rotten logs and stumps.	Blooms April to June. Bears fruit from July to August.	Not practical to harvest in large quantities. Labour intensive to pick and difficult to transport.
<i>Crataegus douglasii</i>	Hawthorne (Black)	Found at low to mid elevations. Grows along waterways and shorelines and in open, deciduous forests. Common south of 55° latitude, especially on Vancouver Island and in dry Interior regions.	Blooms April to June. Bears fruit from August to mid-September.	Potential for large harvest (~50,000kg per season). Not recognized as a NHP, but may be used as a food supplement or for consumption. Currently used in Cottage Industries only.
<i>Empetrum nigrum</i>	Crowberry	Found at mid to alpine elevations. Grows mainly in south Chilcotin, also scattered in cold, coniferous forests, swamps and rocky mountain slopes.	Blooms May to June. Bears fruit from August into fall.	Not practical to harvest in large quantities. Contain large seeds.
<i>Fragaria spp.</i>	Strawberry	Found from sea level to sub alpine elevations. Grow in forest clearings and open woodlands in well-drained rich soils. Some species thrive in rock crevices and in sand near the ocean.	Blooms April to June. Bears fruit from June to August.	Not practical to harvest in large quantities. Limited yield. Currently used only in Cottage industries. Potential for use to hybridize commercial strawberry for improved flavour profile.
<i>Gautheria hispidula</i>	Snowberry (Creeping)	Found at low to mid elevations. Grows in cool, moist forests and bogs, especially on rotting logs or stumps. Does not grow in warm, arid regions.	Data not found.	Not practical to harvest in large quantities. Limited yield. Not palatable. Potential for use as NHP, but not currently recognized.
<i>Gautheria ovatifolia</i>	Tea berry (Western)	Found at low to sub-alpine elevations. Grows in coniferous forests and bogs. Found mainly in the southern region of the wet Columbia Mountains.	Blooms June to July. Bears fruit from August to September.	Not practical to harvest in large quantities. Potential for use as NHP, but not currently recognized. Potential for use as food supplement.
<i>Prunus virginiana</i>	Choke Cherry	Found at low to mid elevations. Grows in open forests, grasslands, especially on warm slopes up to about 5000ft.	Blooms April to June. Bears fruit from July to August.	Bark is a recognized NHP. Not palatable unless processed. Currently used to distil Brandy in Vernon, BC.
<i>Ribes spp.</i>	Currant	Found from sea level to about 6000ft. Grow in open woods, rockslide areas and moist clearings. Common west of Cascade Mountains, and in Lillooet area.	Blooms May to July. Bears fruit from August to September.	Not practical to harvest in large quantities. Cannot compete with European commercial harvest.
<i>Rubus ideaus</i>	Raspberry (red)	Found at low to sub alpine elevations. Grows mostly in coast to interior transition zone, in the East Kootenays and in clearings and disturbed habitat. Not common in mature, open forests. Not found on Vancouver Island or Queen Charlotte Islands.	Blooms April through June. Bears fruit from July to August.	Not practical to harvest in large quantities. Cannot compete with commercial crops.
<i>Rubus leucodermis</i>	Blackcap	Found in southern part of BC, typically not above 51° latitude. Grows in open woods; especially in burned and logged areas.	Blooms late spring to early summer. Bears fruit from July to September.	Not practical to harvest in large quantities.
<i>Rubus parviflorus</i>	Thimble berry	Found at low to mid elevations. Grows in open woods, clearings and shorelines. Common south of 55° latitude.	Blooms May to June. Bears fruit from July to August.	Very difficult to harvest (fragile), and not practical to harvest in large quantities. Potential for uses as NHP, but not currently recognized.
<i>Rubus pedatus</i>	Five-leaved bramble	Found at low to sub-alpine elevations. Grows in moist, mossy coniferous forests, wetlands or clearings. Mainly found in areas of late snowmelt. Only found in mountainous areas in southern BC.	Blooms May to July. Bears fruit from August to September.	Not practical to harvest in large quantities. Transport cost associated with growing regions.

<i>Rubus pubescens</i>	Raspberry (Trailing)	Found at low to mid elevations. Grows in moist to wet forests, wetlands and clearings.	Blooms April through June. Bears fruit from July to August.	Not practical to harvest in large quantities. Cannot compete with commercial crops.
<i>Rubus spectabilis</i>	Salmonberry	Found at low to mid elevations. Grows in shaded swamps, moist clearings and along roads and shorelines. Common along the coast, mainly west of Coast Mountains.	Blooms March to July. Bears fruit from July to August.	Not practical to harvest in large quantities. Potential for use as food supplement or cosmetic ingredient.
<i>Rubus ursinus</i>	Blackberry (Trailing)	Restricted to south-west corner of BC, southern Vancouver Island and the adjacent mainland. Grows in dense to open forest; prolific in burned and logged areas.	Blooms late spring to early summer. Bears fruit from July to September.	Consumption and nutraceutical beverage market (juices well).
<i>Sambucus spp.</i>	Elderberry	Found from sea level to mid elevations. Grow in valley bottoms, on riverbanks and moist forest clearings. Common in southern interior.	Blooms April to June. Bears fruit from July to September.	Native species not characterized for use as NHP. Potential for cosmetic use.
<i>Shepherdia canadensis.</i>	Soapberry / Soopolallie	Found at low to mid elevations. Grows in dry, open woods. Found all over BC except in moist, coastal forests, Queen Charlotte Islands and Vancouver Island (rare).	Blooms April to June. Bears fruit from July to August.	Contain high levels of saponins. Potential for use in natural cleansing agents or as NHP, but not currently recognized. Currently used in aboriginal communities to make "Indian Ice Cream".
<i>Smilacina racemosa</i>	False Solomon's Seal	Found from low to sub-alpine elevations. Grows in moist forests, openings and clearings. Grows south of 56° latitude.	Blooms April to June. Bears fruit from July to September.	Potential for cosmetic use. Not palatable.
<i>Smilacina stellata</i>	False Solomon's Seal (Star-flowered)	Found at low to mid elevations, sometimes at sub-alpine levels. Grows in damp woods and moist clearings. Common all over BC except the Queen Charlotte Islands.	Blooms April to June. Bears fruit from July to September.	Potential for cosmetic use. Not palatable.
<i>Vaccinium alaskaense</i>	Blueberry (Alaska)	Found in moist coniferous forests and along shaded stream banks. Grows mainly on the coast.	Blooms May to July. Bears fruit from August to mid-September.	Not practical to harvest in large quantities. Cannot compete with commercial crops.
<i>Vaccinium caespitosum</i>	Blueberry (Dwarf)	Found at low to alpine elevations. Grows in moist forests, clearings and rocky areas as well as alpine tundra. Does not grow well in very dry or very wet areas.	Blooms May to July. Bears fruit from August to mid-September	Not practical to harvest in large quantities. Cannot compete with commercial crops.
<i>Vaccinium membranaceum</i>	Huckleberry (Black)	Found at mid to high elevations. Grows on mountain slopes, in dry sites of coniferous forests and on densely forested north-facing hillsides.	Blooms May to July. Bears fruit from August to September.	Leaves recognized as NHP. Large market for consumption use, but conflict with indigenous food supply. Currently working on developing plant cultivars for commercial harvest at University of Idaho.
<i>Vaccinium myrtilloides</i>	Blueberry (Velvet-leaved)	Found at low to mid elevations. Grows mainly in the Kootenays and central interior in well-drained soil, shaded woods or rocky outcrops.	Blooms May to July. Bears fruit from August to September.	Grown as commercial crop in Fraser Valley.
<i>Vaccinium ovalifolium</i>	Blueberry (Oval-leaved)	Found at low to sub-alpine elevations. Grows in moist coniferous forests, clearings and bogs, especially on Vancouver Island and in the Kootenays. Grows along the coast and in the interior below 56° latitude.	Blooms May to July. Bears fruit from August to mid-September.	Not practical to harvest in large quantities. Cannot compete with commercial crops.
<i>Vaccinium ovatum</i>	Huckleberry (Evergreen)	Found at low to mid elevations. Grows in gravelly or sandy soil in coniferous forests. Does not occur east of the Coast Mountain Range.	Blooms March through May. Bears fruit from July to September.	Not practical to harvest in large quantities. Limited yield. Not as palatable as <i>V. membranaceum</i> . Potential for cosmetic use.
<i>Vaccinium oxycoccos</i>	Cranberry (Bog)	Found at low to sub-alpine elevations. Grows only in peat bogs and muskegs.	Blooms May to July. Bears fruit from August to September.	Not practical to harvest in large quantities. Limited yield.
<i>Vaccinium parvifolium</i>	Huckleberry (Red)	Found at low to mid elevations. Grows in shaded coniferous forests, especially on rotten logs or stumps. Common in coastal forests and around Shushwap Lake and in the Kootenay Valley region.	Blooms March through May. Bears fruit from July to September.	Not as palatable as <i>V. membranaceum</i> . Potential for cosmetic use.
<i>Vaccinium scoparium</i>	Grouseberry	Found at mid to high elevations in southern BC and west Fraser plateau. Grows in moist, open, coniferous forests and in clearings near timberline.	Data not found.	Not practical to harvest in large quantities. Transport cost associated with growing regions.
<i>Viburnum edule</i>	Cranberry (High Bush)	Found at low to sub-alpine elevations. Grows in moist woods, on stream banks and in swamps.	Blooms May to July. Bears fruit from August to September.	Not practical to harvest in large quantities.

Of these species, the ones that appear to show the most promise for marketability and commercialization are Saskatoon berry (*Amelanchier alnifolia*), Oregon grape (*Berberis aquifolium*), Hawthorn berry (*Crataegus douglasii*), Black huckleberry (*Vaccinium membranaceum*), Elderberry (*Sambucus spp.*) and Soapberry (*Shepherdia canadensis*). The rationale for selecting these six species was based on many factors including the practicality of harvesting large quantities, the potential market they would be sold in and competition with already commercialized berry industries. Soapberry is unique among these species as it contains high levels of saponins that could potentially be used in natural cleansers and as an emulsifying agent in lotions and hair products. In the future, any of the berries on the chart have the potential to be used in functional cosmetics, as large harvest quantities are not necessary for this industry to thrive. The problem with using wild berries as cosmetic ingredient is that until the active ingredients in each species have been analyzed, it is unknown what properties they could contribute to cosmetic products.

4.0 Current State of Wild Berry Market

Cottage Industries

Currently, use of wild berries in BC is almost entirely restricted to cottage industries (Burton, 2006; Ehlers, Berch & MacKinnon, 2003; Keefer, Ehlers & Macpherson, 2003; Powell, 2005). A cottage industry is one in which products and services are home-based. Typically these types of businesses are not an individuals' sole source of income, but rather a hobby or a way to supplement income. Wild berries are used to make jams, jellies, syrups, home-made baking and for individual use. Burton, 2006 provides information about an individual in the Prince George area who produces such products. He reported collecting 545kg of wild berries in one season, and is pushing for the commercialization of the wild berry harvest so that he can commercialize his business. He reported harvesting the following berry varieties: strawberry, Saskatoon, raspberry, blueberry, huckleberry, high-bush cranberry and Oregon grape.

Local Sale

Some berry pickers sell their crops at local farmers' markets or to local chefs (Burton, 2006). One wild berry picker interviewed sold his berries to high-end restaurants in the Whistler

area. If a picker can develop relationships with local chefs, this can lead to increased exposure for local wild foods and can be beneficial to both the restaurant and to the pickers in the area.

Alcoholic Beverages

There are a few companies in BC that use wild berries to produce alcoholic beverages. Kirsch Virginiana, which is made using wild cherries from the Vernon area and Saskatoon berry brandy, both produced by Okanagan Spirits, have received international acclaim at the World Spirits Awards. Wild berry wines that are made in Dewdney by Kermode Wineries have also received international acclaim and are available at many liquor stores around the province. These relatively small operations have brought positive attention to BC and to the wild berry industry.

Market Values of Wild Berries

From Blatner and Alexander, 1998, as cited in Tedder, Mitchell and Farran, 2000, harvesters were paid the following prices for wild berries harvested in the Pacific Northwest of the USA:

Species	1995 (US\$)	1996 (US\$)
Coastal huckleberries (red)	\$3.04/lb	\$2.20/lb
Interior huckleberries (black)	\$2.92/lb	\$2.17/lb
Blackberries	\$2.00/lb	\$1.67/lb

The difficult part about setting market values for wild berries is that the harvest quantities vary widely depending on the season. If the season produces fewer berries, then the prices will increase and vice versa. This is just one of many problems facing those who wish to commercialize the harvest of wild berries.

5.0 Problems with Commercialization of Wild Berries and Current or Potential Solutions

One point that came across most strongly during the preparation of this report was that the process of commercializing wild berries is plagued by many problems. This is by no means an

exhaustive list of the problems facing those involved in this process, but it outlines the main issues.

Lack of Baseline Data

A point brought up by Ehlers et al., 2006, Tedder et al., 2000 and von der Gonna, 2003 was that before commercialization can proceed, baseline data regarding ecological and economic status of the current wild berry harvest needs to be collected. In order to measure the affects of harvesting wild species, it is necessary to have reference information describing habitat, growth requirements and production levels of each species (Ehlers et al., 2003). Without this information it is impossible to know whether or not harvesting wild berries can be a sustainable and viable commercial industry.

Current solution:

Kerns, Alexander and Bailey, 2004, have made progress in this area by surveying the abundance, stand conditions and use of huckleberries in western Oregon. They have also addressed the issue of forest management and how it affects non-timber forest products such as wild berries. In collecting these data, it becomes possible to measure how different forest management practices can influence growth and productivity of wild berries. It is crucial to have this type of information about each species, as each one differs in its response to forest management practices and ecological disturbances. More research of this type needs to be undertaken in BC before proceeding with commercialization of the wild berry harvest.

Land Ownership

With conventional agricultural harvests this problem does not exist as farmers own their land and therefore own the crops that grow on it. When harvesting a wild crop, land ownership issues can cause a lot of conflict for all involved. Berry pickers must obtain permission from land owners before trespassing on their land. This includes passing through it to reach prime berry picking areas such as river or stream banks, which cannot be owned by individuals.

Potential solution:

Tedder et al., 2000 point out that in Oregon, wild mushroom pickers require education and licensing to pick mushrooms. These licenses can be issued by the government or by individual land owners. This system could reduce the number of conflicts over land ownership by giving a limited number of people access to certain areas of land. This system would only work on the small areas that are privately owned or regulated by the government. Crown land and First Nations' reserve land would still require some type of alternate control measure.

Quality Assurance, Supply and Storage

Before the wild berry harvest can be commercialized, there needs to be an established, standardized system for classifying berry quality, assuring berry supply and storing said berries for future use. This is essential because without a minimum reliable supply, no industry will be motivated to use wild berries in their products. It is also an important consideration for those who may invest in the wild berry industry. As stated by Leakey and Izac, 2006, no one will provide funding to expand the market because there is no assured final product, but without funding we will never know if there could be an assured final product.

Potential Solutions:

Establishment of growers' co operations, such as the West Kootenay Herb Growers Cooperation, is a key step towards bringing the very individual-based wild berry industry together to form an efficient and productive group. If berry pickers all over the province were encouraged to sell all or part of their harvest to these co-ops, or central collecting and processing centres, the wild berry industry would benefit by having a proven, reliable, quality supply of wild berries to sell at a premium price. Barriers to establishing this system include access to funding or an initial investment, establishment of fair market prices to pay to pickers, and profitable re-sell prices to charge to customers. These co-ops would likely not be profitable for a few years until a market is established and baseline information about harvest quantities can be collected. For this reason, a large initial investment would be required. If this report and others can succeed in encouraging consumer and commercial interest in wild berries, it is possible that this

investment could come from the market in which the wild berries would be purchased. In addition it is important to initiate a program to domesticate selected wild berry species with high market potential. This not only ensures the conservation of wild berry genetic resources but also opens up the door for commercial use of wild berries with modern agricultural inputs in order to make the wild berry industry economically viable.

Coordination of Forestry Activities and Collection of Wild Berries

Clason, Lindgren and Sullivan, 2008 and Kerns et al., 2004 investigated the effect of forest management practices on NTFP abundance. This is a key issue when considering a wild product that grows in the forest, as what happens to the forest greatly impacts what happens to the species that grow beneath the trees. Logging machinery can destroy berry patches and removal of trees can remove shaded areas in which many species grow. Despite the potential for harm, the relationship between logging activity and growth of berry producing species can be positive. Clason et al., 2004, postulate that species growing in thinned areas would produce more berries due to increased exposure to sunlight. Kerns et al., 2004 found that *Vaccinium parvifolium* had greater frequency and density in thinned stands. *Vaccinium membranaceum* however, had greater frequency and density in old-growth and un-thinned stands. This evidence demonstrates that in order to effectively balance forestry activities with maximization of NTFP harvest, more information needs to be collected for each individual plant species.

Potential Solutions:

More research such as that done by Clason et al., 2004 and Kerns et al., 2008 needs to be performed so that a mutually beneficial relationship can be established between forestry groups and those who harvest berries and other NTFP. Since current research shows that forestry activities affect different species of *Vaccinium* in different ways, it is reasonable to assume that this same relationship exists for other species and these relationships need to be elucidated further. Incentives for forestry groups to cooperate with local residents need to be established so that the potential market for wild berries and all other NTFP can be maximized.

Competition with European Berries

Two examples of European wild berry species that are currently recognized in Canada as natural health products (NHP) are *Sambucus nigra* (European elderberry) and *Crataegus oxyantha* (Hawthorne berry). The Canadian varieties of these berries are *Sambucus cerulean* (blue elderberry), *Sambucus racemosa* (red elderberry) and *Crataegus douglasii* (black hawthorne), none of which are recognized as NHPs. This makes it impossible to use Canadian varieties in natural health products, so companies that need these berries have no choice but to purchase them from Europe. If Canadian companies could be assured a stable, quality supply of local product and this product was recognized as an NHP, the market potential would be enormous.

Potential Solutions:

As mentioned in section 2.0, this problem can be solved by characterizing the local species of these berries to show that they are comparable or better in terms of active constituents than the imported European varieties. This requires a large investment of time and money, but if there was an assured market for the product, investors and research funding organizations would be more likely to provide the necessary resources.

Competition with Commercial Crops

Wild strawberries, blueberries and blackberries have to compete with commercial crops grown for consumption. For this reason, it is unlikely that the wild versions of these berries could ever compete in the consumption market, if for no reason other than extreme disparity between potential harvest quantities. These berries can be marketed as premium ingredients or as value-added ingredients as outlined in section 2.0.

Conflicts with First Nations Food Sovereignty

This conflict appears to mainly centre on the black huckleberry (*Vaccinium membranaceum*) that is an important food supply and traditional food of First Nations' groups in BC (Keefer et al., 2008). The concept of food sovereignty is most commonly defined as below:

“Food Sovereignty is the Right of peoples, communities, and countries to define their own agricultural, labour, fishing, food and land policies, which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food producing resources and the ability to sustain themselves and their societies.”
(Morrison, 2008)

The desirability of the black huckleberry for its unique and appealing flavour makes it a prime candidate for use as a food product. There have been conflicts between local residents, including First Nations’ groups and commercial berry pickers harvesting black huckleberries in BC (Turner, 2001). As commercial pickers tend to cover a large area, they harvest the majority of the berries, leaving few to none for local residents and wildlife. This is a problem for those individuals who depend on these berries for sustenance and for those who use them as traditional medicines in First Nations’ communities. This issue is not exclusive to the black huckleberry, but it seemed to be the species of highest significance to those interviewed.

Potential Solutions:

Certain species of wild berries that have proven market potential such as the black huckleberry are ideal candidates for domestication. Dan Barney of the University of Idaho is actively working on developing plant cultivars for *Vaccinium membranaceum* or, black huckleberry. He plans to have preliminary varieties ready for testing in ten years, according to the University of Idaho’s College of Agriculture website.

Domestication is not a practical option for all wild berry species, but for the black huckleberry it is worth the effort. The berries currently demand anywhere from \$12US to \$30US per gallon in Idaho. Domesticating the species would eliminate competition for wild harvested berries and First Nations’ would be able to access this food source without having to worry about damage to local ecosystems and wildlife.

6.0 Community Concerns with Commercialization of Wild Berry Market

In communicating with several members of the berry picking community in different areas of BC, several common concerns were mentioned repeatedly. The issue of sustainability was

central to these concerns. People have seen their resources exploited and depleted, including timber resources and fisheries. Turner, 2001 mentions the depletion of Cascara and Pacific Yew trees that occurred because the market for them became strong. People are wary about providing information about berry picking areas as they are afraid that commercial pickers will come and destroy the land, leaving nothing for the local wildlife to eat and nothing for local harvesters to collect. One woman from Osoyoos wrote that “paid pickers from berry and commercial companies came in, stripped the plants, damaged so many and showed no respect for wild life”. It is critical to address these concerns and ensure that any efforts made to commercialize wild berry harvests involve local communities. The collection of wild berries or any NTFP should be done in a sustainable, responsible manner.

7.0 Past and Current Research Efforts

Turner, 2001 outlines “principles of sustainable harvesting of non-timber forest products” which includes many suggestions outlined in this report. Implementing strategies to promote and market wild berries and other NTFP in a sustainable, cost-effective manner is essential to moving forward with commercialization of the industry. Keefer et al., 2008 mentions that two important projects are currently underway. They include the Huckleberry Synthesis Project, which is gathering information about huckleberry management from existing literature with the end goal of developing black huckleberry management guidelines. This project is being led by the Ministry of Forests and Range Research Branch. The other, called “Measuring Success in Managing for Saskatoon berries and other NTFPs”, funded by the Siska Traditions Society, hopes to produce guidelines for soopolalie, beaked hazelnut, Oregon grape and Saskatoon berry. The second phase of this research project, funded by Investment Agriculture Foundation of British Columbia (Hilbrecht et al., 2006), includes measurements of active ingredients in many of BC’s wild berry species.

8.0 Future Goals and Conclusions

It is important to recall past actions when considering future ones. This is especially relevant when considering natural resources such as NTFP that are limited in quantity, are an important part of First Nations’ traditional culture and an important food source for wildlife. The public is wary of offering up BC’s natural resources because of what has happened in the

past, and these past actions should be considered lessons learned for any new enterprise wishing to market NTFP. The wild berry industry has the potential to be profitable and sustainable, but it is necessary to take action before the mistakes of the past can be repeated.

Collecting a comprehensive repertoire of research pertaining to each wild berry species is necessary before proceeding with commercial harvest. Markets need to be analyzed and established along with growers' co-ops so that a reliable, quality supply of berries can be available for those who wish to purchase them. The involvement of the scientific community is critical to fulfilling these goals. The area has received a lot of attention in the past ten years, however, despite the progress that has been achieved, much more information is needed.

Moving from the current wild berry industry into a more commercialized, marketable one will be a slow and involved process. Local communities and First Nations' groups must be involved if this process is to be successful, as they are the ones who will ultimately feel the effect. Peoples' concerns must be taken seriously, as local support is needed to avoid conflicts and gain access to harvest areas.

Concentrating on particular species of wild berry on which to focus marketing efforts will help speed up the process of commercialization. Species that can provide large yields from year to year and species that grow in the same geographical area should be marketed more than rare, dispersed ones. Domestication should be considered for species that show the greatest market potential.

The ultimate goal when commercializing the wild berry industry should be to fully understand this precious resource so that it is possible to maintain the balance between people and nature while also maintaining a profitable and viable business.

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