

Coast Information Team
Economic Gain Spatial Analysis—Non-Timber Forest Products
Author Response to Peer Review comments

March 22, 2004

Note: Pacific Analytics peer review comments are reproduced below, with author responses inserted in blue.

Some Specific Comments

There are a number of assumptions and/or data (explicit and implicit) in the Report that appear to me peculiar. Outlined below are the more substantive ones.

Devil's Club

There are a number of assumptions (explicit and implicit) that appear to me peculiar.

1. **Devil's Club Sales Forecasts.** The Report uses a first year sales of 10,000 bottles of Devil's Club extract (at \$23 per 50ml bottle) growing to 16,000 – 17,000 bottles by year three. Other than commenting that the entire retail market for all nutraceuticals in North America is approximately \$4.2 billion (no explanation for how this figure was derived, nor is there a sourced paper), there is no comment on the value of market demand for Devil's Club itself. *The figure of \$23/bottle was a low end, conservative estimate within the range of prices for Devil's Club offered on the Web. No one really knows yet what the market demand for DC will be a year from now, nor what the market growth will actually be over the next three or four years. Again we assumed a conservative figure for market growth which was an extrapolation of the growth over the last two years. Do 16,000 bottles represent a significant part of the market or is it insignificant? We have assumed that this is an insignificant part of the actual market.* Further, and much more problematic, the report states that there are “hundreds” of Internet companies (besides, I would suspect, all the established health food stores) that sell Devil's Club. What marketing plan would enable a new company to capture a market for 10,000 bottles in the first year? *The terms of reference of this work did not include the formulation of a marketing plan for the various NTFPs scrutinized. To produce a good marketing plan for a single NTFP discussed herein would cost at least \$50k itself.* If 10,000 bottles is the average sales for an Internet company (i.e., the new BC company would be equally as adroit as other companies in capturing markets), that suggests an existing market of, say, 200 companies times 10,000 bottles or 2 million bottles a year, excluding store sales. This seems very high to me, although the Report doesn't give any idea of the actual market size. The same comments can be applied to the discussion on dried Devil's Club. *This is correct. Two million bottles a year is not realistic. Also 10,000 bottles in the first year is certainly not the average sale for an internet company, although these figures are simply not given out by these companies. (We have tried.) The 10,000 bottles figure was selected in view of the experience of two companies which are white-controlled but which are pretending to be First Nations operations and which*

have first year sales which exceed these numbers. We are assuming here (perhaps optimistically) that a Kitasoo/Xaixais controlled company can perform equally well.

2. **Expected Pricing:** On page 6, the Report states that a 50ml bottle of Devil's Club retails for US \$12 – US \$55. This price range is huge, but there is no indication as to why. Is it due to quality differences, market dominance, or what? The price range is huge because these companies have assumed that such is what the market can bear. Quality differences do not come into play here yet because there are no criteria of standardization for Devil's Club, as there are for all the herbals being sold from the European pharmacopoeia. In fact we have found in previous work that sometimes what is being sold as Devil's Club extract is not even Devil's Club. On page 15, the expected price used to determine economic impacts is roughly US \$17 (Can \$23). Why is this price chosen? We assumed this price because it is conservative, given the price range of actual products, and also because many competitor products cluster around \$20 to \$25. Is the assumption that a new BC company will be able to garner retail prices for its product, that is, that all sales will go through the Internet at retail (non-bulk) prices? This is correct. We are advising the Kitasoo/Xaixais to concentrate on direct sales to final consumers over the web and to tourists through the cooperation of BC Ferries. These assumptions are not clear.
3. **Set-up and Operations Costs and Employment:** The initial three year costs are estimated at \$150,000 per year, creating 7 jobs (no indication of PY equivalent). Seven half time positions per year over the initial three years. Harvesting will add another approximately 15-20 jobs, although the Report just states “plus other positions involved in ...”. Again, there is no indication of the PY equivalent. Fifteen full time positions annually. Yet in Table 3 (page 15) the number of jobs is listed as 4 and the total employment income as \$100,000. Does 4 refer to Person-Years or jobs? This figure should have been 7 and refers to seven half time positions per year over the initial period. What is the rationale (or sources) for the expected \$150,000 per year set up cost and for the expected required employment? Roughly, the \$150k figure involves the cumulative costs of: formulating a business plan, training eight to ten wildcrafters to search out areas of Devil's Club concentration, the actual process of locating the Devil's Club plants, determining sustainable harvest rates given the microclimates of the concentrations, monitoring prices and market growth, test harvesting, extraction and packaging, and test marketing. With sales of \$200,000 (from Table 3) and employment income of \$100,000 there is still another \$100,000 not accounted for. Does this go for materials and packaging, for mailing costs, for profit? Approximately half materials, packaging and mailing and half profits.

Medicinal Mushrooms

The section on the economics of medicinal mushrooms is more complete, and provides a cogent argument for the potential value of medicinal mushroom production on Haida Gwaii. Nevertheless, there are a number of confusing entries.

1. **Labour/Infrastructure Costs:** Table 4 (page 26) outlines a summary of costs for setting up the cultivation. The total amounts is \$300,000, so one must presume that these are annual costs, since the Report states that the set up will cost between

\$450,000 and \$550,000 for the first two years. But then the report state that the actual investment needed is \$1.2 million. **Our error.** The \$550k has been changed in the accompanying text to \$600k. The \$1.2m figure includes a significant marketing campaign and further R&D into the chemical compositions, therapeutic effects and marker chemicals in indigenous fungi other than *G. applanatum*, *G. tsugae*, and *F. pinicola*. This is a conservative estimate.

2. **Sales, Costs and Employment:** On page 27, the projected sales are estimated at \$210,000. Later in the Report (under Tourism Revenues – clearly a mistake) on page 29, Table 5 states that the sales are \$300,000. **Our error.** The appropriate figure has been changed. Employment is projected at 7 and employment incomes at \$150,000. Since these are “trained personnel”, one must presume that these are not full time positions. **Trained wildcrafters are pleased to receive slightly more than \$20k annually on Haida Gwaii. Many people there are impoverished.**

Food Mushrooms

Again, the section on food mushrooms has a good deal of economic information, in part I suppose because of the more established markets. However, there are still a few peculiarities that can be pointed out.

1. On page 36, the volume and value of exports of pine mushrooms from the central coast is highlighted (without sources) at ~150,000 lbs (70 tonnes or more than twice a “good” year?) and \$17.8 million (clearly a typo; should be \$1.78 million). **correct and changed.** Commissions to pickers were \$~290,000 (16% of total revenues), leaving almost \$1.5 million in returns to the buyers. Figure 2 on page 32 displays the breakdown of costs for chanterelle mushrooms. Here picker wages are listed as 44% of revenues, and this after including European duties and weight loss that would not have been in the average value used for Pine mushrooms. Obviously Pine and Chantelles are different, but those differences are large. **This is correct. A single small pine mushroom of the “correct” shape, fragrance, colour and taste can retail in Tokyo for more than US \$150.00. The purchasing family slices it very thin and consumes it in a soup, for example, for an entire week.**
2. On page 35 it states that the price of Pine mushrooms to the picker “varies from \$5.00/kg for the lower grades to \$250/kg for the best”. I have no idea whether \$250/kg for a pine mushroom is possible or is this a typo. **This was a typo and should be \$150. It has been changed in the text.**

TEMPLATE SUGGESTION

We are familiar with threshold analysis. However to adequately estimate the variables necessary to “fill in” the accompanying template for even one product would require three to five days additional work. We have discussed at least seven products in our report – *Ganoderma applanatum*, *G. tsugae*, *Fomitopsis pinicola*, *Tricholoma magnivalare*, *Oplopaiax horridus*, and several types of Chanterelles. Some of these have radically different markets, market

growth, market entry conditions, price variability, and so on --even within the medicinal mushrooms.

Our March 31, 2003 final report fully responded to the (considerably modified) terms of reference for this work. Since then we have conducted considerable economic analyses and three revisions to present the work in its attached form.

When an industrial sector already exists in a region and therefore there are some obtainable (at least potentially) data on financial characteristics (present market share, revenues and expenses, economic rents, etc.) it is possible to develop reasonable scenarios of how the sector could expand under various conditions. In the case of Non-Timber Forest Products on the coast, the industry does not, for all intents and purposes, exist, and therefore a different tack for examining potential gain (or perhaps more specifically, viability) is necessary.

One approach often used in such circumstances is “threshold analysis”. The intent with this approach is not to determine by how much the sector will grow under varying conditions, but rather under what conditions will the sector provide a normal rate of return to the investors. That is, given appropriate assumptions about future pricing and sales, and expected expenses needed to generate those sales, will the return be great enough to offset the necessary investment. Governments and businesses alike often use this type of analysis when proposing the development of a new (particularly risky) industry.¹

For assessing Non-Timber Forest Products, then, it will be important to define explicitly a number of characteristics for each product under consideration over a say, 10 year time horizon.

1. **Volume Sales:** Ideally volume sales should be tied to market demand so that there is a clear understanding of market share over time. During the first few years it is likely that sales will be zero or near zero, since it takes time both to establish the infrastructure (including plant cultivation) and to see marketing efforts come to fruition. Volume sales would be the key variable in determining threshold volumes.
2. **Infrastructure** While infrastructure cost is not a component that I would chose to be variable, it is the denominator when determining rates of return to investors. Hence, the question to be asked would be: what profit (total revenues minus total expenses (including all taxes, depreciation and interest costs) must be earned to provide a rate of return of say 10%.
3. **Operating Expenses:** Operating costs can be separated into two types: costs that differ with the volume of sales (variable costs) and costs that do not change with sales (fixed costs). It is not unusual that fixed costs begin in year one even when there are no sales. From a calculation perspective, it is important to have an explicit link to variable costs (they don't have to change on a one-to-one basis).). It is recognized that detailing variable and fixed costs for each product may prove to be extremely difficult. Nevertheless, given the high uncertainty with expected sales for

¹ A good example of this is the off-shore oil and gas industry on the coast. A recent report by Bridges and Associates and Pacific Analytics estimated the threshold production level for a gas site and an oil site given various assumptions on infrastructure costs, lifting and delivery costs, oil and gas pricing, and royalty regimes.

non-timber forest products, it is especially important to try to define these variable and fixed costs, even if there is a fairly wide level of uncertainty with the estimates [The Terms of Reference highlight the fact that there will likely be uncertainty with economic estimates]. Note also that a value for asset depreciation and for borrowing costs (if any) need to be factored into operating expenses. Similarly, the rate of return to investors is an after-tax return, therefore if corporate income taxes apply (and they may not if the business is a First Nations entity), these must be removed.

4. **Pricing:** Price multiplied by volume gives total revenues and, after subtracting operating expenses, gives the value of return. Dividing return by infrastructure costs gives the rate of return on assets. Consequently, it is important to explicitly define a time series of expected prices that are “reasonable”. Note that prices for many of these products could fall over time since the number of vendors is growing very fast and the apparent profit margins are large.

There are, of course, a number of other characteristics that need to be assigned. Principally among these would be the employment requirements. The Report tended to itemize the types of jobs, rather than the amount of labour required. For a threshold analysis it would be necessary to stipulate the labour requirements (in person-months since my guess is that many of the jobs are seasonal) times a reasonable full-time equivalent salary.

The three threshold scenarios suggested by the Terms of Reference would be: optimistic, base case, and pessimistic. The optimistic case perhaps would have the sector capturing a relatively large market share fairly quickly with stable pricing. The base case may see a small market share for the first say five years (first two years of real sales) climbing over the next five years at a “reasonable rate” of growth and slightly falling prices. The pessimistic case may see similar volume and pricing, but with higher than expected variable (or fixed) costs. Of course, these scenarios are just suggestions, and other projections may provide a greater understanding of the dynamics of the sector. What is important is that the scenarios not be simple linear transformations of one scenario, but rather that the scenarios test the overall importance of the major assumptions.

RECOMMENDATION

Although it may be useful to clean up the Report by including more documentation of data, providing better explanations of why particularly regions and products were chosen, etc., it is clear that the most important task is to determine the actual viability of these non-timber forest products, or at least to understand under what conditions they would be viable as a business. Consequently, my recommendation would be to assign all effort on undertaking a “threshold analysis” of the various products first. Then, if the analysis suggests that they could, indeed, be viable, a more detailed business plan including product types, location, etc. could be developed.

CITS NOTE: This review should be considered in conjunction with the excel spreadsheet intended to assist the NTFP authors with developing financial projections using the threshold approach mentioned above.