

Imagining the Future of Cross Border Resource Management within the Fraser Lowland: A Delphi Analysis of Environmental Issues

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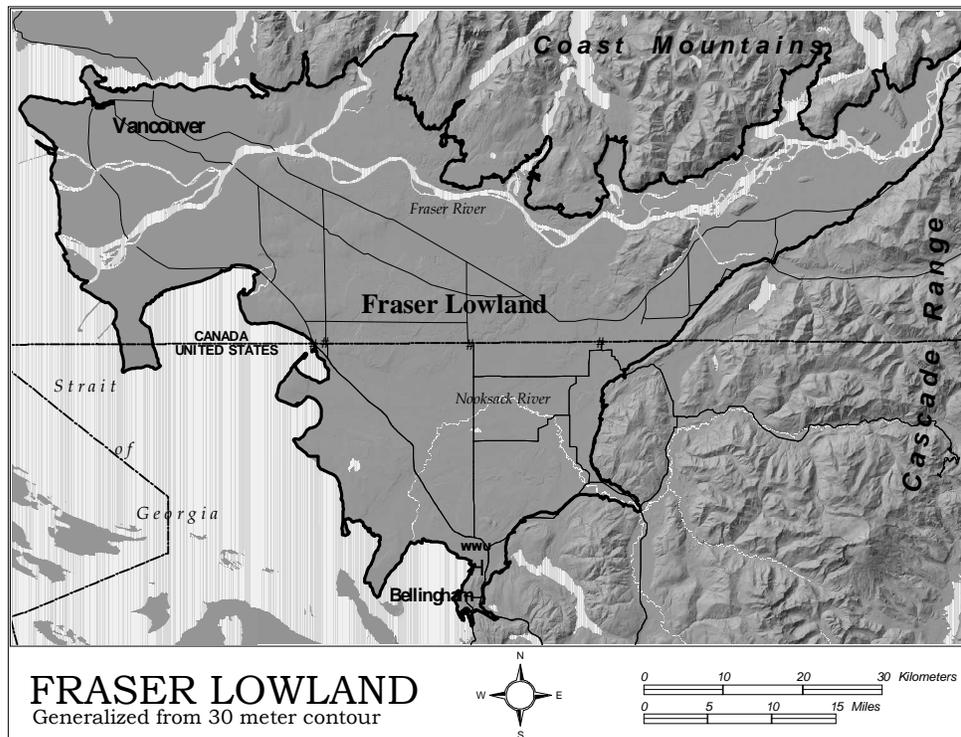
A. ABSTRACT

Fraser Lowland, a unified bio-region divided between Whatcom County, Washington and lower mainland British Columbia, challenges development of consistent and effective environmental resource management. The recent impasse over a proposed power plant on the US side is a case in point. The main stumbling block was expected trans-border air-shed stress levels. In the absence of established cross-border institutional structures for air quality, the issue has evolved in an apparently makeshift and somewhat chaotic manner. This research drawing upon recent literature involving cross border regions [CBRs] and new forms of governance engendered in them will investigate current cross border perceptions on common environmental issues exploring whether necessary conditions are present for the emergence of cross border regional governance. The Delphi methodology using key government and non-government actors on both sides of the border was used to explore this question by addressing the specific issue do respondents have a similar sense of the most pressing cross border environmental issues and to the same relative degree. Results of the study this in the affirmative, but do raise additional questions of meeting sufficient conditions for CBR activity

1. Introduction

This study utilizes a Delphi model to explore governance issues in the Fraser Lowland (FL), a transborder bioregion, located in northwest Washington State and southwest British Columbia (Figure 1). Scott's (1998, 1999) typology of "cross-border regionalism" is used to assess the nature of regional identity development in the FL and ask the question to what extent is a "community of interest" leading to "actual cooperation experiences" developing which is commonly referred to as an emergence of a cross border region (CBR).

Figure 1. Fraser Lowland



The study of state borders and borderlands has a long history in the discipline of Geography, and can be traced back at least to Mackinder (1904). In the past decade, a revitalized border studies has appeared. This is due to several macro trends. At a practical level, the demise of the USSR, and expansion of the European Union, has redefined the meaning, significance and role of state borders. The creation of Eurozones, for example, represents an explicit attempt to foster cross-border identities (Blatter, 2004; Scott 1998, 1999). Meanwhile, critical theorists have focused on the multi-scalar impacts of globalization and neo-liberalism, not the least of which is re(de)territorialisation of the nation-state. The logic of capital mobility in late capitalism, challenges the sanctity of state boundaries.

Within this context, CBRs have received increased scholarly interest (see, for example, Blatter, 2004; Scott, 1999; Perkman and Sum, 2002; Sparke, 2005). Simply, “[a] CBR is a territorial unit that comprises contiguous subnational units from two or more nation-states.” (Perkman and Sum, 2002, 3) As Perkman and Sum note, although CBRs share the same history as borders, “[w]hat is new... is that the construction of cross-border regions have become a more or less explicit strategic objective pursued by various social forces within and beyond border regions...” (2002, 3).

A pervasive issue in the literature concerns the extent to which CBRs experience a unique identity and governing regime. Scott’s typology, referred to above, identifies three “sources of cross-border regionalism in Europe and North America” (1999: 614). These are:

- | | |
|--------------------------------------|--|
| Cognitive | [p]rocesses of creating regional self-awareness: identification with common problems and development contexts as pre-condition for establishing communities of interest. |
| Discursive | [t]he creation of ideological platforms and paradigms that provide political legitimacy and orientation to cross-border regionalism. |
| Material [i]nstitutional frameworks: | resources and incentives that encourage cross-border cooperation. |

This analysis is designed to assess the cognitive basis of cross-border identity in the Fraser Lowland. In addition before leaving this point, it is also important to note that Scott differentiates between these a priori sources of cross-border regionalism and ex post facto actions that demonstrate the true existence of a CBR

(Scott, 1998). In sum, this is the difference between initial necessary conditions and final sufficient conditions. This paper will focus on the necessary conditions as a first step in the emergence of a true CBR in FL, although recent activities will need to be introduced as well in support of this exploration. The reason being that development of a true CBR involves a rather complex and somewhat messy recursive and iterative process not a simple linear evolution. Finally, returning to the initial point, it will become clear that at the macro regional level (Cascadia) discursive and material sources of cross-border regionalism are and have been well developed over the past several decades. What certainly has not been explored in more than a cursory state/provincial macro level as reported by the Canadian Government's Policy Research International (2005) is the cognitive source. Thus, this analysis will focus at the micro level specifically on the cognitive issues through the use of a Delphi.

The remainder of this paper is organized as follows: (1) the next section outlines the geographic context of the study area, (2) the following section discusses in more detail Scott's three necessary conditions and evidence from secondary sources demonstrating the existence of the discursive and material, (3) through the use of a Delphi and statistical analysis it demonstrates strong indication of meeting the cognitive condition, and (4) by focusing on recent joint activities and disputes between two border communities, Abbotsford, BC and Sumas, WA, it explores how close we are to meeting sufficient conditions.

2. Context

The Fraser Lowland is relatively flat terrain, measuring approximately 3,500 kilometres². (Armstrong 1990). It is delimited by the Coast Mountains to the north, Cascades to the south and east, and the Strait of Georgia shoreline to the west. This geographical setting has resulted in a confined air shed. The rich soil and mild climate make this prime agricultural land. The dominant physical feature of the region is the Fraser River whereas the dominant human features are the United States-Canada international boundary and the Vancouver metropolis. The boundary divides this bioregion approximately into two halves, each of which represents extremes of location in their respective nations.

With regard to population, the Fraser Lowland is dominated by Metro Vancouver, with a 2006 population of approximately 2.1 million. (Statistics Canada, 2006). On the Canadian side, this study focuses on the more rural setting of the Fraser Valley Regional District (FVRD), to the east of Vancouver, encompassing the communities of Abbotsford, Chilliwack and Mission. The FVRD had a 2006 population of approximately 260,000 (Statistics Canada, 2006). The 2.4 million people north of the border, dwarf the approximately 190,000 south. The American portion of the region is entirely contained within northwestern Whatcom County, dominated by the city of Bellingham. Despite the population imbalance, the Fraser Lowland as a whole is characterized by high rates of population growth and attendant economic activity. Whatcom County's six year growth rate (2000-2006) of 11.5 percent (U.S. Census Bureau, 2006) compares to a five year 8.2 percent increase in the FVRD (Statistics Canada 2006).

At the macro scale, the Fraser Lowland lies at the geographic epicentre of two larger, overlapping, cross-border regions: Cascadia and the Georgia Basin/Puget Sound (or, more narrowly, Vancouver-Seattle) region. Academic discourse on Cascadia has attempted to deconstruct the meaning of an indistinct but emotionally charged space (Sparke, 2002, 2005, Alper, 1996, Henkel, 1993). In contrast, the Georgia Basin/Puget Sound is usually the focus for studies on the development of joint cross-border governance infrastructure, often in comparative analysis with other CBRs (Hilderbrand et al 2002, Pfau, 2001, Alper, 2004, Taylor, 2001, Blatter, 2004). Regardless of how it is defined, literature on the region ignores activity in close proximity to the border. Moreover, the tendency is to focus on evidence of cross-border institutions, to support an argument about the material significance of a CBR.

Our micro scale analysis of activity that essentially occurs on and immediately adjacent to the border, therefore stands in contrast with the macro level studies of Cascadia. For those living adjacent to the border, the line is a negotiated entity that forms an implicit component of place and space. (Widdis, 1992). When the boundaries of a CBR coincide with a local bioregion, as occurs in the Fraser Lowland, the border plays a role in the environmental management drama that inevitably ensues. Such was the case in the early years of this decade in our study area. A proposal by National Energy Systems Co. (NESCO) of Kirkland, WA, to build a second, gas-fired, electrical generation plant in Sumas WA (SE2), approximately eight kilometres from Abbotsford BC City Hall, generated a protracted legal battle and grassroots furor over

diminished air quality, that lasted from 2000 to 2006. Although the protest had bi-national elements, it was heavily weighted on the Canadian side of the border. In the absence of an international air quality treaty in this part of North America, or any institutionalised dispute resolution mechanism, the proposal bounced back and forth across the border before it finally came to rest, just shy of the Canadian Supreme Court. The power plant proposal was eventually withdrawn. However, it is this dispute that triggered this micro scale study.

3. Study's Focus on Sources for the Emergence of a CBR

One of the most intriguing and problematic aspects of CBRs is their plentitude of institutional designs and strategies (Scott, 1999). This complexity is further exhibited both in the great varieties of transnational regionalism that exists and also the "...myriad of systems operating at various spatial levels..." (p. 606) within a given region. This results in the emergence of multiple, episodic, and ad hoc cooperation and coordination governance networks across borders that are both overlapping and interconnected. Leresche and Saez (2002) have likened this to the biological concept of synapsis or "'very fine communication between neighboring cells through small networks in a membrane' or 'a point of contact between two neurons'" [Dictionary Robert, reported in Leresche and Saez, 2002, 88]. Over time this micro level cross-border activity can lead to a broadening and thickening of relationships and the eventual emergence of CBR governance.

Despite the multitude of CBR designs, Scott (1998, 1999) has proposed that these cognitive constructs emerge from a general framework made up of what we will classify as necessary and sufficient conditions. The necessary conditions are the aforementioned three a priori factors the cognitive, discursive, and material sources. However, it is only while meeting these three conditions that ex post facto co-operative activities can demonstrate that sufficient conditions have been met and thereby contribute to the emergence of sustainable cooperative cross-border governance networks in a borderland area. In Scott's words (1998,) "...it is therefore necessary to differentiate between intentional policies, self-promotional rhetoric and actual co-operation experiences. It is, indeed, the latter that provides more sensitive criteria for judging co-operative efforts rather than a priori defined regional development concepts or planning initiatives."

As already stated, this study's focus is to assess at the micro scale the under investigated cognitive basis for the emergence of a sustainable CBR in the FL. However, due to the complexity and inherent messiness of the iterative and recursive process of CBR emergence and the potential for many non-linearities in the progression, it is also necessary in a brief fashion to explore the other two a priori factors (discursive and material). In addition it is also important to look for evidence of ex post facto cross-border cooperative activities. As a whole, this will enable us to evaluate not only the cognitive, discursive, and material sources for the emergence of a CBR, but also comment on the potential for sustainability based on coordinated and cooperative actions.

Our empirical analysis of the cognitive basis of regional identity in the FL is presented in the next section.

4. The Delphi

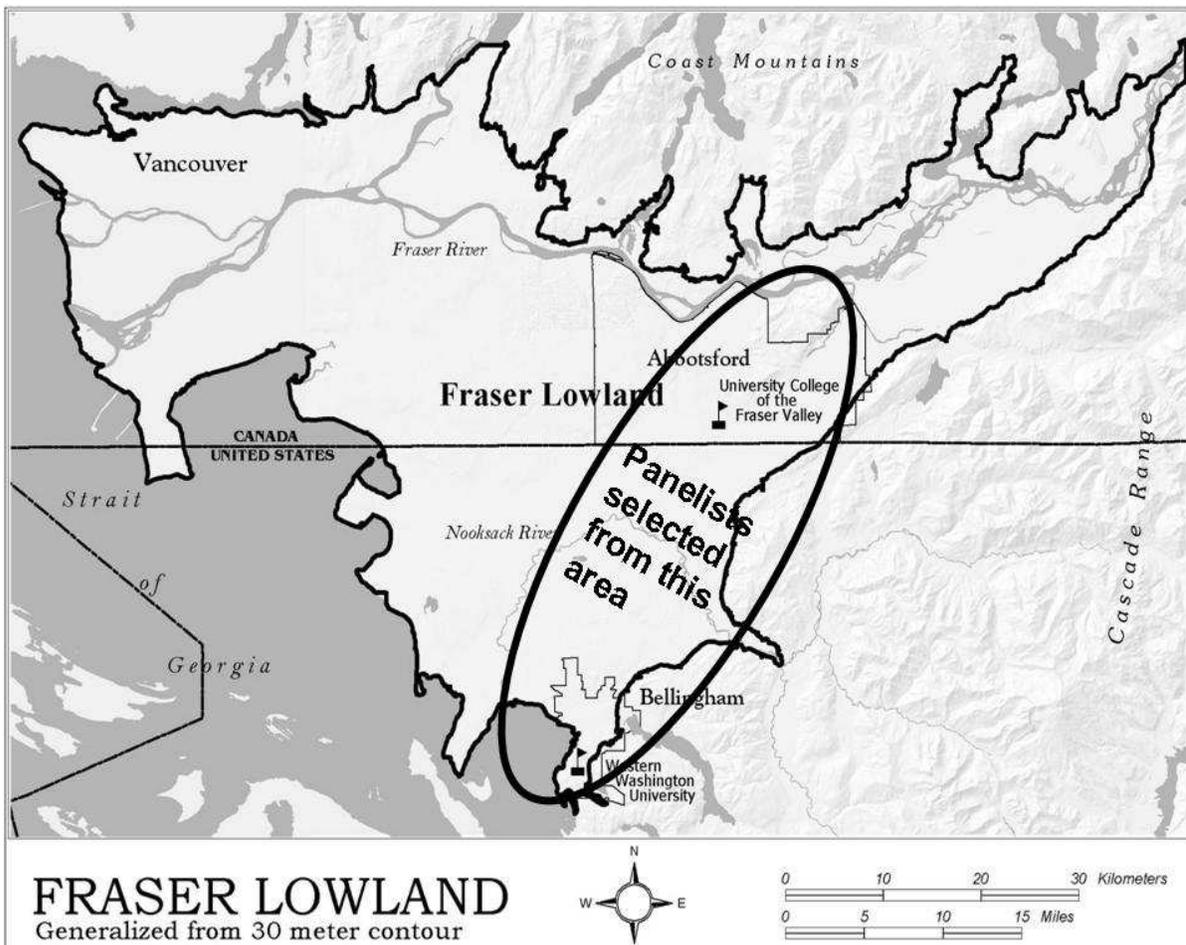
4.1 Methodolgy

The Delphi method (Adler and Ziglio 1996, Dalkey 1972, Gupta and Clarke 1996, Sackman 1975) is a controlled anonymous qualitative information gathering and generating technique that draws upon the combined knowledge of a panel of experts by eliciting and refining information from the panel through a series of rounds. Using both discursive and ordinal evaluative methods, the Delphi provides a means for thoughtful anonymous discussion, reflection, and evaluation of complex issues that are not easily addressed in other formats while limiting impacts of personal, political, or national bias. To accomplish this it utilizes a method of controlled conversation among panel members whose identities remain anonymous throughout the exercise. This guarantees that through a series of rounds the discussion focuses on ideas not personalities, politics, backgrounds, or other biasing factors, and that no group or individual dominates the

discussion. This is done by submitting positions or ideas to the researchers who summarize and organize these and then share this information with the group as a whole. In addition, it enables the researchers to ask for further clarification if necessary in order for all panellists to fully express and understand each idea.

As rounds progress panellists are asked in addition to discussing their own ideas to rank and order all the ideas submitted by members of the group as a whole. This ranking focuses on three aspects of issues: (1) the expected level of importance or impact of an issue upon the situation, (2) the likelihood that a suggested issue will occur, and (3) the confidence the panellist has in his/her answer. This allows for the airing of all positions including contradictory or unpopular ones and for evaluating the level of their impact and their probability of occurrence. In addition, a Delphi does not require that the panel eventually agree to one set of answers. Ranked and ordered results are reported back as both averages and histograms, thus providing information on not only the most likely response but also the deviation and whether multimodal clusters result. This enables the clear representation of both majority and minority positions. Finally, panellists' report of their own confidence in addressing any of the ideas raised further informs the result. Given the wide range of possible ideas included, not all panellists will be equally familiar with each and can thus express a lack of or limited knowledge in any given area or even decline to respond on some issues. Thus, a Delphi will report on issues both discursively and ordinally with a special focus on the importance, probability, and the confidence of panellists in their response.

Figure 2. Delphi Study Area



4.2 Applying the Delphi Methodology

The project began by interviewing current decision makers who were involved in the SE2 controversy or other cross-border issues within the study area and asking them to volunteer for the study and/or recommend others with similar influence and expertise. Given the location of the SE2 issue, it was decided to seek Canadian participants from the eastern portion of the Fraser Lowland i.e. within communities of the Fraser Valley Regional District, and Americans from northeastern Whatcom County on a transect that ran from Chilliwack, BC through the border crossing of Abbotsford, BC and Sumas, WA southeast to Bellingham, WA (Figure 2). Eighteen panellists were recruited for the study seven Canadians and eleven Americans. One American dropped out after the first Round and a second American skipped the third round resulting in 16 to 18 valid responses per round, split between the two nations. Panellists included political leaders, planners and academics, business people, and environmentalists (Table 1). All of this information was kept confidential during the study to prevent bias.

Table 2. Background of Delphi Panellists

Category	Number of Panellists
Academics and Planners	8
Elected Officials, past and present	5
Environmentalists	3
Businessmen	2
TOTAL	18

Between February and December 2006, four Delphi rounds were performed. Table 3 lists the foci of each round. Note that the bold faced type indicates the round in which a line of discussion began, and the plain faced type, the rounds in which it was repeated.

Table 3. Round by Round Foci of the Delphi

Round 1	<p>Identify and discuss pressing cross-border environmental issues.</p> <p>Likert evaluation of the current understanding of cross border identity and consciousness and the spatial scale required for addressing the above issues.</p>
Round 2	<p>Rank and score pressing cross-border environmental issues.</p> <p>Second Likert evaluation of the current understanding of cross border identity and consciousness and the spatial scale required for addressing the above issues.</p>
Round 3	<p>Second scoring of pressing cross-border environmental issues.</p> <p>Likert evaluation and discussion top five cross-border environmental issues focusing on their critical and cross border nature.</p> <p>Likert evaluation and discussion of organizational ways to address the top five cross-border environmental issues.</p>

Round 4	<p>Second evaluation of the top five cross-border environmental issues focusing on their critical and cross border nature.</p> <p>Second evaluation of the organizational ways of addressing the top five cross-border environmental issues.</p> <p>Likert evaluation and discussion of general issues raised by the study not covered elsewhere.</p>
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Round one served as both a brainstorming session and an initial evaluation of the geographic context within which these issues exist. The brainstorming section provided panellists with a blank slate on which to suggest issues for group consideration in later rounds in an open and unbiased manner. In the geographic context section, using a ten point Likert scale, panellists were asked six questions in three categories (Table 4). First, they were asked to assess the impact of the international border itself on managing cross-border environmental issues; second, the degree of cross border consciousness today and a decade into the future. And finally, they considered the need for participation by institutional actors at various levels of geographic scale in order to successfully address the issues. This latter represented a way of measuring the level of confidence panellists had in instituting cross-border solutions to the above issues with or without participation of other local, regional, or national players. Overall these six questions establish a geographic context within which the actors can and must make decisions while the issues section began the process of identifying the issues to be addressed. The purpose of subsequent rounds was primarily to probe and refine the thoughts offered in round one. Analysis in this section will focus on responses provided to the "geographic context" portion of the Delphi.

Table 4. Geographic context variable codes and questions

Variable Code	Question	Answer Range
International Border Impact		
R# Border	1. Considering both the current and future state of environmental health in the Fraser Lowland, how positive or negative is the impact of the international border on effective shared resource management?	1= very positive, 5= neutral, 10= very negative
Degree of Cross Border Identity		
R# Identity_2006	2. What is the current degree of cross border identity or consciousness among people living in our local cross border region?	1= very high, 5= some, 10= little to none
R# Identity_2016	3. Ten years from now what will be the degree of cross border identity or consciousness among people living in our local region?	1= very high, 5= some, 10= little to none
Need for participation by Institutional Actors at different scales		
R# GVRD	4. For effective cross border management of our local common environmental resources, what degree of success can be attained without the participation of the Greater Vancouver Regional District [GVRD]?	1= very high, 5= some, 10= little to none

R# St/Prov	5. What degree of success can be attained without the participation of the state/provincial officials and institutions?	1= very high, 5= some, 10= little to none
R# Federal	6. What degree of success can be attained without the participation of the federal officials and institutions?	1= very high, 5= some, 10= little to none

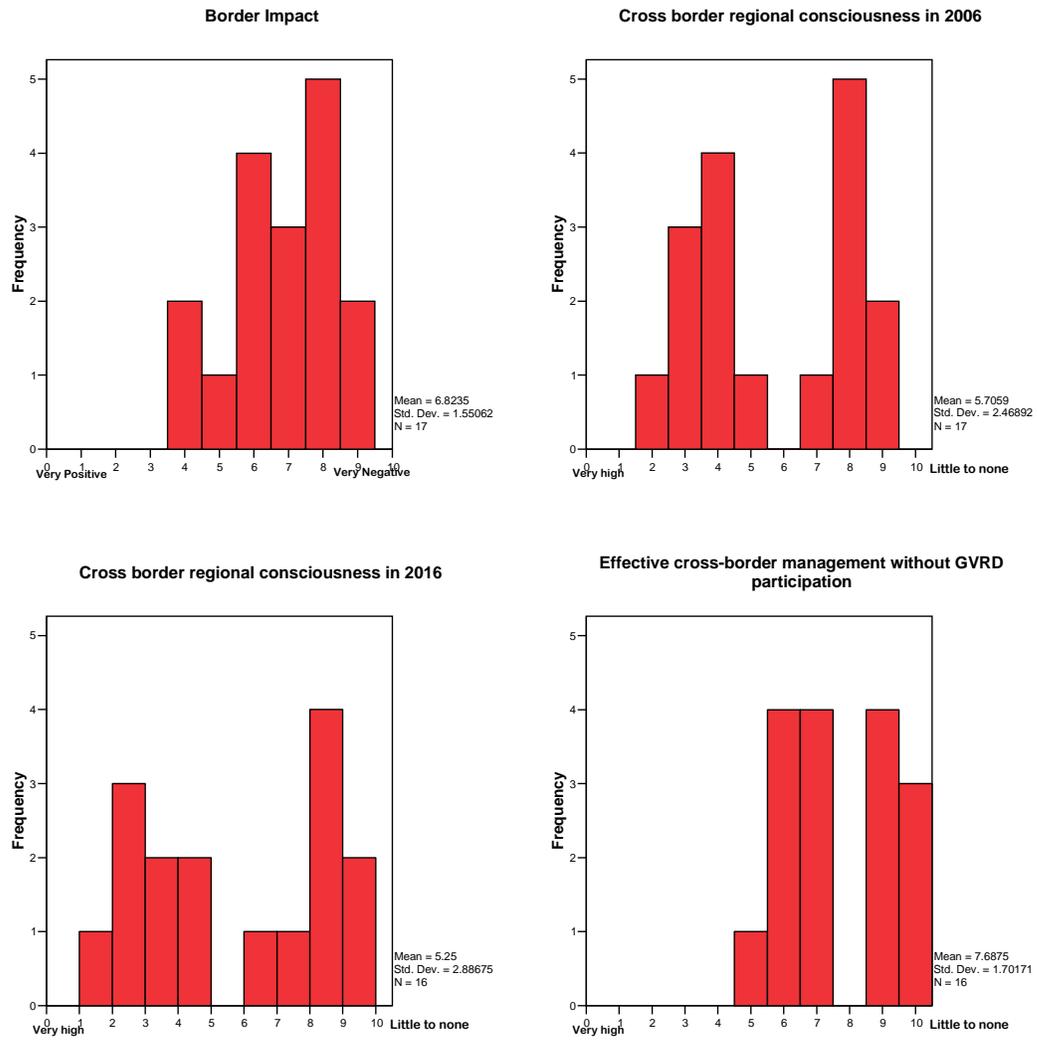
Table 5. Descriptive Statistics for the Six Questions addressing Geographic Context

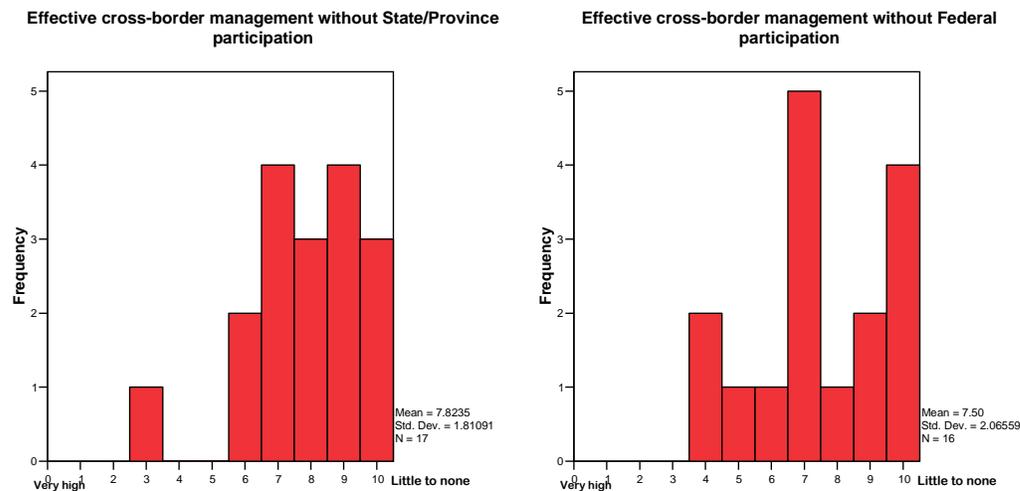
PERCEPTIONS							
ROUND 1							
	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Cases
R1Border	7.1	7.8	3	9	1.73	-1.13	16
R1Identity_2006	5.7	6.0	1	10	2.42	-0.19	17
R1Identity_2016	5.6	6.0	1	10	2.83	-0.47	16
R1GVRD	7.1	7.0	3	10	2.49	-0.37	16
R1St/Prov	7.0	7.5	2.5	10	2.75	-0.44	16
R1Federal	6.8	7.0	3	10	2.67	-0.27	17
ROUND 2							
R2Border	6.8	7.0	4	9	1.55	-0.47	17
R2Identity_2006	5.7	5.0	2	9	2.47	0.02	17
R2Identity_2016	5.3	5.0	1	9	2.89	-0.04	16
R2GVRD	7.7	7.0	5	10	1.70	0.10	16
R2St/Prov	7.8	8.0	3	10	1.81	-1.06	17
R2Federal	7.5	7.0	4	10	2.07	-0.31	16
CONFIDENCE IN RESPONSE							
ROUND 2							
R2Border	8.1	8.0	6	10	1.25	0.22	15
R2Identity_2006	8.1	8.0	5	10	1.50	-0.24	16
R2Identity_2016	7.4	7.0	3	10	1.82	-0.41	16
R2GVRD	7.3	8.0	2	10	2.43	-0.94	15
R2St/Prov	7.9	8.0	5	10	1.59	-0.23	16
R2Federal	8.3	8.5	3	10	1.81	-1.74	16

4.3 Results of Geographic Context Investigation

Table four lists the variable codes representing each geographic context question used in the first and second rounds plus the range of possible answers to each. Table five provides the descriptive statistics from the panellists' responses to these six questions. Two types of data are provided here; first, the perceptions indicating the average strength and deviation of panellists' convictions for round one (prefixed with R1) and two (prefixed with R2) and second, the confidence they had in their response during round two (the only round in which this line of inquiry was pursued). Finally, Figure 3 provides histograms for the panellist's perceptions from round two.

Figure 3: Distribution of Scores, Geographic Context, Round Two





The first graph in Figure 3 focuses on the border impact. By examining both the statistics and graphs for the first question it is clear that by round two, the border was seen to have slightly negative impact on solving cross-border environmental issues. The histogram forms a somewhat compact and fairly symmetrical cluster, with values ranging from a 4 (some positive impact) to a 9 (highly negative impact) with a mean average of 6.8 mean and 7.0 median.

Based on statistical averages, cross border consciousness averages at the center of the range of values indicating it is rather moderate today (5.7 mean and 5.0 median) with not much expectation of change a decade from today (5.3 and 5.0). However, bi-modality is evident in both “consciousness” histograms (ie, 2006 and 2016). There are clearly two groups of respondents, with nearly equal clusters between those perceiving a fairly high level of cross-border consciousness and a nearly equal number answering that the consciousness is fairly low. A decade in the future, the year 2016, the spread of results increases slightly while migrating slightly towards an increasing cross border identity. This suggests more uncertainty in how to read this response than was apparent in the descriptive statistics alone.

With regard to effective cross-border management of environmental issues, it is clear that the panellists generally favoured participation with actors at broader scales: regional, provincial/state, and national (respective means were 7.7, 7.8, and 7.5 while medians were 7.0, 8.0, and 7.0). The interesting outcome here is the lack of favoring one scale over another, and a lack of desire by the cross border region to go it alone. The histograms however show a slightly more complex response. The local GVRD region produces a slightly more compact and symmetrical diagram then the provincial and federal level graphs. This pattern of increasing deviation as the scale becomes more spatially remote seems to indicate more confidence in the benefits of working with smaller and more local organizations over larger and remote ones. A factor that might be anticipated given the local focus of CBRs.

With regard to confidence of response, it is clear by reviewing the descriptive statistics, in Table 5 that on average the panel had a relatively high level of confidence in their responses across the board and generally low levels of variance, although there are the occasional outliers as might be expected given the breadth of the panel’s backgrounds and experience. The two lowest values, though only slightly lower than the rest of the results, are for R2Identity_2016 and R2GVDR. Perhaps this is reflecting lower confidence in predicting the future rather than the present. Certainly determining the level of cross-border consciousness a decade hence is much less certain then discussing the same issue today. Likewise, it is interesting that the greatest uncertainty about dealing with other levels of government is with the Vancouver GVRD, a body only established in 1967 and one yet to establish a clear track record vis-à-vis it’s neighbouring Regional District, the Fraser Valley Region District [FVRD], and Whatcom County across the border. With time this uncertainty may decline.

In summary, the following trends on “geographic context” were revealed in the opinions expressed in this portion of the Delphi:

- (1) the border exerts a mild negative impact on environmental management issues;
- (2) panellists were clearly split into two groups over the level of cross-border consciousness, both current and future, resulting in averages virtually in the centre of the scale;
- (3) there is broad consensus that involvement of higher levels of government, in both the United States and Canada, is key to the success of cross-border environmental management in the local area, however the dispersion of the responses increases as the scale increases and the agency becomes more remote.
- (4) there is a moderately high level of confidence by panellists in their responses to all questions.

4.4 Analysis

The hypothesis tested in this section is: has the geographic context in which cross-border environmental issues are to be addressed spread across the border? Hence, is there or is there not a significant difference between the responses of American panellists and Canadian ones. In sum, is the view of the geographic conditions under which cross-border resources are to be managed similar to both Canadian and American panellists, thus, demonstrating the necessary cognitive preconditions for the development of cooperative CBR community of interest?

To test this hypothesis several steps were taken: (1) analysis was limited to round 2 answers, (2) randomness was assumed, (3) exploration of the normality of the data was performed, (4) a choice was made of statistical test to apply, and (5) options were applied to this test given the small sample size.

Randomness is based on the assumption that the seated panel in this Delphi study although only one of many possible panels of actors with an understanding of cross-border environmental issues is quite representative of similar cross-border decision makers as a whole. Defending this assumption may be somewhat problematic since not all actors were contacted nor considered for the panel. However, it has been a standard assumption of Delphi studies in the past to limit the study to an expert panel, and has been accepted by the scientific community over the past decades of Delphi work. No attempt was made to test this assumption.

Although the data collected in regards to geographic context was collected at the ordinal scale, it has become common practice to utilize this kind of data, especially relative scores and likert scores where over five choices were available on the scale (10 were present in this study), as representing interval data and hence a candidate for statistical testing. Regardless of how valid such a common assumption is, such a small sample of results (varying from 18 to 15 responses depending upon the actual instrument entry/response) requires testing for normality. Such tests were performed using both Kolmogorov-Smirnov with Lilliefors Significance Correction and the Shapiro-Wilk statistics. For the six questions used to describe the geographic context with the alpha level set to 0.200 (the default suggested by SPSS), only one variable could potentially be described as normal (R2 Confid Federal) having met both tests (Table 6). All other variable’s scores and confidence answers could be statistically assumed to be non-normal.

Table 6. Tests for normality

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
R2Border	0.188	17	0.114	0.921	17	0.153
R2Identity_2006	0.235	17	0.013	0.860	17	0.015
R2Identity_2016	0.205	16	0.072	0.877	16	0.034
R2GVRD	0.219	16	0.038	0.881	16	0.041
R2_State	0.154	17	0.200	0.900	17	0.068
R2Federal	0.158	16	0.200	0.901	16	0.083
R2ConfidBorder	0.209	15	0.076	0.910	15	0.134

R2Confid_Identity_2006	0.211	16	0.055	0.884	16	0.045
R2Confid_Identity_2016	0.207	16	0.066	0.900	16	0.079
R2Confid_GVRD	0.190	15	0.152	0.902	15	0.101
R2Confid_State	0.156	16	0.200	0.930	16	0.241
R2Confid_Federal	0.257	16	0.006	0.816	16	0.004
0.200 Is considered a lower bound of the true significance.						

The non-parametric test used to determine if American and Canadian panellists responded differently to the questions in this section of the Delphi was the Mann-Whitney U Test, the most popular test to determine if two parts of a sample represent two independent populations. Since the sample sizes of the Delphi were small (no more than 18 responses), the exact method for determining critical values was utilized rather than the standard asymptotic approach. Simply the exact method is considered to provide a more precise result for small data sets.

The results are provided below [Table 7]. Even though the alpha value was set to a very liberal 0.10 none of the six questions exploring geographic atmosphere showed a significant difference in either scores recorded or in levels of confidence by respondents in either round one or two between American and Canadian panellist. Basically, there was no difference in responses between the two nationalities.

Table 7. Test for Independence between American and Canadian Panellists regarding Geographic Context

Round 2 – Score						
	R2 Border Score	R2 Identity 2006 Score	R2 Identity 2016 Score	R2 GVRD Score	R2 State Score	R2 Federal Score
Mann-Whitney U	26.0	27.5	23.0	29.5	24.0	22.5
Exact Sig. (2-tailed)	0.393	0.490	0.471	0.864	0.302	0.353
Round 2 – Confidence						
	R2 Border Confid	R2 Identity 2006 Confid	R2 Identity 2016 Confid	R2 GVRD Confid	R2 State Confid	R2 Federal Confid
Mann-Whitney U	25.0	21.0	21.5	14.5	16.0	23.0
Exact Sig. (2-tailed)	0.846	0.354	0.380	0.158	0.132	0.456

Thus, the analysis demonstrates that no difference is found in the responses to the six questions defining the geographic context between Canadian and American panellists.

5. Discussion

Using Scott's framework we seek to demonstrate that the necessary pieces for the emergence of CBR governance are in place at a very fine micro scale in a part of the Fraser Lowland. Through a variety of government programs material incentives have been offered in both the economic and environmental realm to stimulate cross-border governance of common resources; and a number of these incentives are currently being acted on. As noted earlier discursive narratives of cross-border region building at the macro scale, continue to stimulate, enliven, and even alarm visionaries throughout the FL and beyond into the vaguely bounded realm of Cascadia. This study provides evidence that cognitive sources of cross-border regionalism are also present at a very fine micro scale; thus, providing the fertile ground for the synopsis that Leresche and Saez identify as so critical in growing a CBR.

To the best of the researcher's knowledge this is the first time that a study has focused specifically on the cognitive level at the micro scale. There are of course much broader macro level investigations that have been done (Policy Research International, 2005), but these are so broad that they speak to relationships not only between adjacent states and provinces but also between distant places like large and quite culturally distinct or complex spaces like Quebec and California. One begins to think more of some form of non-contiguous supra-nation building when dealing with such macro level trends than a humbler CBR. Clearly such macro level studies are important, but they are quite different than focusing on a single divided bio-region like the Fraser Lowland. This of course is not to in any way ignore the many excellent micro level studies of places along North American borders. But, their purposes and foci are as different, varied, and numerous as their number and none focused specifically on the cognitive precursors.

A second point to raise is the difference of the necessary and sufficient conditions for the emergence of a true, sustainable CBR and its accompanying networks of governance. That is what Scott refers to as the emergence of a co-operative community of interest. There are many ways of approaching this issue; besides necessary and sufficient, one could also typify this as the difference of a *de jure* and *de facto* CBR, or an active and passive one. Using *de facto* and *de jure* provides a useful lens in differentiating between CBRs that emerge primarily from the grass roots level or bottom up and those that are put in place and nurtured in a more top down fashion, as has been the case in a number of the EU internal borderlands. Thus, there is much merit in differentiating between those CBRs that have been heavily encouraged and financed by the center; that is differentiating between CBRs that seem more creatures of a supra-national agency with defined tasks, than those that result from local grassroots initiative in an ad hoc fashion. Those latter CBRs that result from some combination of local cross-border frustration, opportunity, and entrepreneurship fostered by a lack of attentiveness and interest by spatially more remote central agents resulting in a mobilization of local forces would seem to better represent the active communities of interest that Scott stresses. However, in truth all CBRs have elements of both. They are not simply passive vessels through which centralized tasks and funding are passed. Nor are they truly strong enough by themselves to challenge the realities of spatially more remote yet powerful central agents. Instead they are formed under some combination of encouragement and frustration, of incentives and yet vexation, and freedom and controls.

This brings us to the third means of attempting to describe a true CBR and this turns back to Scott's differentiation between a self or a centrally promoted creation to garner resources from the center, again a sort of passive vessel that once built simply needs to be filled and what he defines as a true CBR. Thus, this stands in contrast to an active agent, ever renewing and re-creating itself in a dynamic manner under the umbrella of larger scale agents with which it periodically contests for resources and/or more harmoniously exploits them. A sustainable community of interest will emerge in a cross-border region only if it is highly active and agile, continuously re-accessing and re-creating itself and its geography, at all scales, and with the encouragement or at least the lack of outright discouragement by more macro scaled entities. It is here where all of the necessary conditions must continuously be attended to in order to maintain the potential for reaching the sufficient conditions. This then requires more than just a passive, *de jure* region, instead it requires an active and by such actions a *de facto* CBR that through synopsis continually grows the community of interest, the absence of this will result in the withering of this relationship.

A small example from the study area will illustrate this crucial point of the need to continually address the dynamics of both necessary and sufficient conditions. Throughout the past decade a number of centrally provided financial incentives were offered to Abbotsford and Sumas and other spatial entities in their environs if they could work together on common issues across the border. One particular focus was on sewage collection and treatment. In 1997, the cities of Abbotsford and Sumas signed a twenty year sewage contract wherein the former agreed to process sewage from the latter. The deal was initiated by NESCO, owner of SE1 (i.e. the power plant constructed in Sumas in 1993). Prior to this because of inadequate treatment facilities in Sumas, SE1 trucked their cooling tower water to Bellingham, WA. (Beyak, 2002) At the time, the deal was generally recognized as a gesture of cross-border neighborliness. By shipping the sewage north, Sumas would forgo an estimated \$7 million upgrade to its system. This relationship of cooperation began to unravel in 1998, with the proposal by NESCO to construct a second, the much larger SE2 beside the first.. Initially this was blessed by political and economic interests on both sides of the border. Only as grassroots opposition to environmental and quality of life considerations developed, starting first on the American side and then quickly spread to the Canadian side, did the project become viewed as a potential danger to the local region by Abbotsford but not Sumas. By then, the water contract was recast as regionally divisive in that it enabled the SE2 project by providing a critical component of infrastructure. Whatever the environmental and economic merits of the case, the fact that Sumas avoided directly engaging Abbotsford's citizens and their concerns in the decision making process, which was portrayed as not a cross-border issue, resulted in an equally blunt approach from Abbotsford. They in turn ended informal mayoral level discussions across the border and threatened to renegotiate the sewage deal. Suddenly this formerly blossoming relationship was threatened. Even the eventual cancellation of SE2, although not due to any action by Sumas, has failed to fully heal these wound. The entire unfortunate SE2 saga demonstrated these two communities retreating into the well worn historical pattern of using the border as a shield or wall to retreat behind instead of a bridge across which to engage one another (Buckley and Belec, 2005).

Despite strains on the cross-border relationship surrounding SE2, in reviewing the statistical results of the research, the primary analytical discovery of this study is the uniformity in opinion by panellists on four out of six questions on the geographic context and the lack of any nationality based difference on all six. Specifically, on the questions of regional consciousness where non-uniform bimodal results were registered, it was not nationality that created this bifurcation of the panel.

Reviewing the results of the first question, it can be concluded that as a single group, the bi-national panel felt that the border plays a negative role in environmental management. Of course, the direction of opinion on this question is not unexpected. Nevertheless it begins to at least outline the hurdle that the border presents. An ordinal rating of 6.8 out of 10 though, suggests that the hurdle may not be insurmountable. The fact that there is no significant difference between those north and south of the "line" is at least suggestive of a connection in the cognitive realm. Clearly, the border is important, but not the only challenge to environmental management in the Fraser Lowland.

What then to make of bi-polar results on the assessments of present and future regional consciousness, as registered in questions two and three? They highlight the presence of two discourses on the CBR which suggest the coexistence of different levels or types of regional cognition. However, these two discourses are not tied to national affiliation. No significant difference could be found between how American panellists split between these clusters and Canadians. Hence despite there being two distinct camps in responding to this question, nationality played no significant role in creating them. However, a more detailed set of questions could help to sort out if, for example, those selecting a low score for regional consciousness, see the overwhelming strength of national identities effectively negating a CBR identity. Were those scoring at the other end of the scale picking up on the presence of regional symbols and/or the (unifying) cross-border protest against the power plant proposal? The contradictory nature of the border, highlighted by these findings, harkens back to Nicol's (2005) earlier observation.

The final three questions on extra-territorial involvement at scales beyond the mirco level yielded almost identical assessments and compact unimodal clusters. The clear message is that panellists from both sides of the border recognize that environmental management is a complex, multi-jurisdictional enterprise. For example, involvement of the GVRD, the location of the vast majority of the population in the Fraser

Lowland, and generator of much of its air pollution, is seen as necessary by all panellists. Further, environmental policy creation and enforcement occurs largely at the State/Provincial and Federal levels in both countries. Thus their participation also equally makes sense to panellists from both sides of the border.

Thus we can conclude that despite the bimodal response to the level of cross-border consciousness, at a cognitive level it is not the border that causes any difference in panellists' cognitive evaluation of the geographic context.

Finally, this research has also demonstrated the utility of the Delphi technique in executing a micro level CBR investigation in the FL in particular and suggests the value of this tool in studying the meaning and significance of the of the Canada-United States borderline in environmental governance and CBRs in general. By drawing knowledgeable participants into a multi-round discussion, the Delphi methodology is ideally suited to yield insights that act as a pointer to the location of the border within a "social constitution". (Coleman, quoted in Nicol, 2005).

6. Conclusions

In summary a number of general conclusions can be drawn from this report. First and foremost by utilizing Scott's framework on the sources for the emergence of a CBR it is clear that for the micro scale study performed here the source cognitive exists. Second and related to the first, an equally important contribution of this study is the demonstration of specifically the cognitive sources existing at the micro scale; conditions critical to Lareshe and Saez's concept of cross-border synopsis. We have come across no other micro level study that focused on this particular source for the emergence of a CBR.

However, the third point, meeting these necessary conditions still leaves open the question of whether or not sufficient conditions have yet been met in order for a true and sustainable community of interest to develop in the Fraser Lowland. Based on the controversy that continues to surround the now defunct SE2 power plant, it is apparent that we are still quite early in the process and to conclude one way or the other appears to be premature.

One final point from this study is that it demonstrates the value of the Delphi method in investigating the issue of the emergence of CBRs. Its use of anonymity and controlled discussion enables both agreement and disagreement to emerge without any threat of retribution or embarrassment. Although it may or may not portray what the future will hold, it does accurately portray what important actors expect in the future. Further, Nicol states that, "borders cannot be taken at 'face value'"; rather they "need to be interrogated as changing, evolving, and self-contradicting entities." (2005, 769) The Delphi method is a useful tool for doing this type of investigation.

This then leads us to the issue of what still needs to be done. However, given the complexity and dynamism of ever evolving relationships in borderland regions, rather than creating yet another list, we more modestly wish to suggest one area to focus on given our specific results. The issue of cross-border consciousness, current and future, and the bimodal response registered here, provides an excellent jumping off point for future work. Why does our group of experts, who so closely agree on many other important cross-border issues, disagree so definitively on this issue? Certainly this is a critical point for future investigation, especially given the fact that nationality or for that matter no other sorting of the panellists into available categories in this study was found to explain this bifurcation. This certainly warrants further investigation.

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