OPEN AND SECTORAL MODELS OF PUBLIC PARTICIPATION: DOES MODEL TYPE MAKE A DIFFERENCE IN LAND USE PLANNING?

by

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ABSTRACT

Two methods, "open" and "sectoral," of including citizens as partners in land use decision making in British Columbia were examined for their ability to achieve social and environmental goals of government. The "open" model allows participation of any citizen where as members of the "sectoral" model are chosen based on the interest they represent. Two "open cases" (Prince George and Vanderhoof) and two "sectoral" cases (Robson Valley and Dawson Creek) representing land and resource management planning processes (LRMP) in north central British Columbia were used in this study.

Social criteria (inclusion, empowerment, communication, and understanding) were measured using a four point Likert scale in a mail survey of LRMP table members and interview responses were coded using a four point agreement scale. A mail survey (using a percent scale), interviews (using a four point agreement scale), and a document review were used to assess how well environmental criteria (impacts, connective corridors, monitoring criteria, disturbance ecology, and biodiversity conservation) at four levels (general within the plan; by individual resource management zone (RMZ); between RMZs; or with respect to adjacent planning areas) were considered in the four cases. The mail survey and interviews were also used to gain an assessment of how well prepared the participants were to discuss environmental issues.

I used the Kruskal-Wallis one-way analysis of variance, with a significance level of 5%, and a multiple comparison test and found differences for 14 of 32 comparisons of the social criteria from the mail survey and interview data which indicated the open model may be more effective in achieving the social objectives of the LRMP process. Lack of differences for the environmental criteria do not allow rejection of the null hypothesis.

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INTRODUCTION

Historical Overview

Until recently public land management in North America, including British Columbia, has been conducted with little public involvement in the decision making process (Caldwell et al. 1994, Hammond 1991, Nixon 1993). Power to make decisions about these resources resided with members of the government who were entrusted to act on behalf of the public (Nixon 1993, Sirmon et al. 1993). The citizens at best were consulted but were not part of the decision making process of the various government agencies (Hammond 1991, Tanz and Howard 1991, Nixon 1993).

Exclusion of the public and control of public forest resources by industry and government were not issues during the period of rapid economic expansion in the 1950's; however, the public interest in environmental and resource issues started to increase in the next two decades (Caldwell et al. 1994). Exclusion from the decision making process resulted in public disappointment, frustration, anger, conflict, and lawsuits over land use decisions (Kessler et al. 1992, Sirmon et al. 1993, Thomas 1995). Public interest about environmental issues was heightened in the 1960's and early 1970's by such concerns as nuclear fallout, debate over the controversial book "Silent Spring" (Carson 1962), and the establishment of environmental groups such as Greenpeace in British Columbia (Dunlap 1981, MacDonald 1991, Nash 1989).

Global concern over sustainability and economic issues led to a report from the World Commission of Environment and Development (WCED), also known as the Brundtland report, that encouraged all countries to include the public as key participants in land use planning (WCED 1987). In response to this and other global initiatives, in October, 1986, the Canadian Council of Resource and Environment Ministers (CCREM) established the National Task Force on Environment and Economy to start a discussion regarding environmental and economic issues (Doering 1993).

Recommendations of the task force resulted in development of round tables that engaged stakeholders in a consensus based process on issues regarding sustainability (Doering 1993). One such development, the National Round Table on the Environment and Economy (1989), spawned the formation of the national Forest Round Table on Sustainable Development in 1991 (Thompson and Webb 1994), and establishment of the British Columbia Round Table on the Environment and the Economy in 1990 (Doering 1993). The round tables allow various jurisdictions to discuss cross boundary issues and they "...provide a framework for moving beyond consultation to genuinely engaging members of the public" (Doering 1993:10).

The British Columbia Context

Public participation in land use planning during the expansion years of the 1950's and 1960's was non-existent as government sought to stimulate the economy of British Columbia. Forestry in British Columbia started to change when the concept of integrated resource planning was introduced in 1973 on a local level through a process called "Resource Folio Planning" (Ness in Hastings 1994). The next change occurred with the introduction of the Forest Act of 1979 which allowed the granting of forest licences, tree farm licences, and pulp wood agreements to major licencees. These licences holders were required to submit 20 year management and working plans for approval by the Ministry of Forests after a review period in which the plans were available, usually at open houses, for review and comment by the public (Information Services Branch 1981, Vance 1990). Public participation in forest management by the 1980's was generally advisory in nature (Information Services Branch 1981).

Events in British Columbia from the late 1970's to the early 1990's --- such as disputes over logging in temperate rain forests of South Moresby, Clayoquot Sound, Carmanagh valley, and the Stein valley --- significantly influenced public opinion in British Columbia (Nixon 1993, Tester 1992). During this period there were signs that

the British Columbia government was considering a higher level of public participation for some situations (Information Services Branch, 1981). The "Public Involvement Handbook" published in 1981 identifies "Information," "Consultation" and "Extended" as the main types of participation to be used in forest planning (Information Services Branch 1981). Extended participation, the most inclusive type, would at best involve selected individuals with a high level of technical knowledge working on specific local issues (Information Services Branch, 1981). The average citizen did not have this technical knowledge and would not be included in the decision making process (Vance, 1990).

The pressure continued to mount for broader public involvement and in 1991 a group of British Columbians known as the "Tin Wis Coalition" called for a greater voice in land use decisions (Pinkerton 1993, Tester 1992). This group proposed the creation of "...43 community boards, one for each forest district, with seven people directly elected to each board and six people appointed by the Lieutenant Governor in Council (provincial cabinet)" (Tester 1992). The "Tin Wis Coalition," which consisted of first nations, labour unions, and environmental groups from Vancouver Island (Pinkerton 1993, Tester 1992) did not achieve the proposed legislative changes; however, this group plus others such as Greenpeace, the Western Canada Wilderness Coalition, and the Green Party contributed to changes in the way British Columbia conducted land use planning.

Subsequent to the establishment of the British Columbia Round Table on the Environment and the Economy in 1990, the provincial government passed legislation to create the Commission on Resources and Environment (CORE) in 1992 (CORE 1992, Doering 1993). CORE was empowered by the provincial government to regulate land use planning in British Columbia by the following means (CORE 1992:7):

- Developing a province-wide strategy
- Developing, implementing and monitoring: regional planning processes, community-based participatory processes, and a dispute resolution system
- Coordinating initiatives within the provincial government
- Encouraging the participation of Aboriginal people

The "regional" and "community-based" planning processes developed by CORE follow a land use strategy that "...is best fulfilled through the concept of consensus or shared decision-making" (CORE 1992:25). In 1994 the government of British Columbia passed into law the Forest Practices Code Act (FPC), which gave British Columbians the legal support to participate in land use planning (Province of British Columbia 1994, 1996). The FPC does this by providing a legal framework for establishing resource management zone (RMZ) objectives and strategies, developed in community-based planning processes, that set management direction in higher level plans (Province of British Columbia 1996). The community values contained in the strategies for resource management zones provide direction to all operational plans (Province of British Columbia 1994, 1996).

Today in British Columbia the highest level of public participation occurs in two CORE-initiated planning processes: 1) regional (CORE) planning; and 2) sub-regional (LRMP) planning. The CORE processes were developed for specific areas defined as the Vancouver Island, Cariboo-Chilcotin and Kootenay Regions. In these regional processes, land use zoning and resource management strategies are developed on a broad, multi-community or regional scale (Resource Planning Section 1993).

Elsewhere in the province the public was included in the planning process through sub-regional plans known as Land and Resource Management Planning (LRMP) (Integrated Resource Planning Committee (IRPC) 1993). This process is described in "Land and Resource Management Planning (LRMP): A Statement of Principles and Process" (IRPC 1993). In adopting the new planning process, the

British Columbia government committed to goals for social, economic, and ecological sustainability (IRPC 1993).

Both the regional and sub-regional processes are higher level planning processes resulting in plans that, when approved by government, provide direction to lower level plans (Province of BC 1993). The intent is to achieve consensus about the "big picture" of land and resource management, thereby reducing conflicts on a drainage-by-drainage basis.

Concepts and Models of Public Participation

Planning is essentially linked to politics because it provides government with a mechanism to redistribute wealth and deliver programs such as education, housing, and is used by government to support the interests of corporations within the free enterprise economy (Friedman 1987). Three models of participation have influenced the evolution of land resources planning: the electoral model, the judicial model, and the shared decision making model. The electoral model of participation, as noted earlier, has led to frustration and anger among the public in part because government agencies were insulated from the public they were supposed to represent (Parenteau 1988). Powerful economic interests had the resources, not available to the average citizen or small business, to work in conjunction with government to develop a planning paradigm that supported their economic interests (Forester 1989, Parenteau 1988). The land use planning paradigm built on the government–corporate partnership relied on science to the extent that "...professionals make decisions using a rational, scientifically-based analytic process" (Wondolleck 1988). This paradigm captured narrow market interests through the maximization of commodities using concepts such as sustained yield (Kessler et al. 1992, Parenteau 1988).

The electoral model of public participation was supported by the judicial model of participation for resolving disputes (Kessler et al. 1992, Parenteau 1988). The

judicial system failed in part because it only recognized those with a legal interest such as land owners and tenure holders (Parenteau 1988). A second failing of the judicial system is that it created winners and losers and did not concern itself with solutions capable of accommodating a range of interests outside the legal purview of the case (Wondolleck 1988).

The third model of public participation, shared decision making, is accomplished by the empowering citizens to participate directly in the decision making process. Sherry Arnstein (1969) defined public participation as a redistribution of power so that citizens can influence the decision making process. Arnstein's definition resulted from her observation that the public consultation process did not result in new policies, or substantial changes that would benefit the poor within the urban landscape (Heywood 1973). Arnstein believed that the impoverished are best helped through the process of shared decision making in programs including employment, housing, and the allocation of resources (Arnstein 1969, Heywood 1973, Parenteau 1988).

Arnstein's definition of public participation can be extended to resource planning. Society's ability to sustain resource uses for current and future generations is directly related to how well people conserve the land base (Leopold 1970, WCED 1987). Citizens must be involved in the planning process because communities are dependent on the land base for food, medicine, clean water, fresh air, recreation, culture, and economic opportunities such as mining, oil, gas, timber, and tourism. Although these will always be basic human needs, the exact requirements of future generations are unknown. Therefore, an important principle in the planning process is to have respect for all values and to not dismiss aspects of ecosystems that are not well understood (CORE 1994, Leopold 1970).

Ecosystems can be very small or large in scale and are defined as "...a biotic community plus its abiotic environment" (Noss and Cooperrider 1994:9). Ecosystems change over long periods of time and the dynamics between fauna, flora, and the

abiotic components are complex and only partly understood by humans. Human activities are currently measured in very limited terms such as annual allowable cut determinations; however, ecosystem impacts are much more difficult to assess. Therefore it is important to involve scientists and various professionals to provide information and technical support in planning processes involving natural resources. Knowledge possessed by local people who work with the land also contributes to understanding of the landscape and possible consequences of proposed actions. Citizens, scientists, decision makers, and managers must work together in preparing current land use plans and generating feedback that can be used to alter future iterations of the planning process.

Depth of Citizen Empowerment: the Arnstein Scale

Public participation options range from authoritarian approaches to complete citizen empowerment. The amount of citizen involvement depends on the complexity of the problem and the need to represent interests that are outside the local community (Heifetz and Sinder 1990, Sample 1993). Arnstein (1969) developed a scale consisting of eight levels of citizen empowerment in decision making processes. The lowest two levels, "manipulation" and "therapy," are equivalent to no participation (Arnstein 1969). Manipulation is a process that uses participants to provide the answers that decision makers want, whereas therapy is a process whereby the authorities try to change the opinions or values of those who are involved (Arnstein 1969). The next three levels, "informing," "consultation," and "placation," are described as "degrees of tokenism" (Arnstein 1969:217). Only the upper three levels, "partnership," "delegated power," and "citizen control" offer varying degrees of empowerment to participants (Arnstein 1969). The "partnership" form of participation allows citizens to share decision making with government (Arnstein 1969). "Delegated power" gives public members "dominant decision making authority over a particular plan or

program," and in "citizen control" the public is additionally provided with funding to run a program (Arnstein 1969:222-223).

Models for Representation

All forms of public participation seek to bring the values, perspectives, and knowledge of a cross-section of the larger community to bear in the planning process. The idea is to involve a manageable number of people (a "team") in a way that achieves representation across the full range of interests. The literature indicates that the planning team approach consists of two fundamental types: 1) the open model and, 2) the sectoral model (Blahna and Yonts-Shepard 1989, Fairfax 1975, Sirmon et al. 1993, Thomas 1995).

In the sectoral model, participants are selected on the basis of specific interests that are to be represented. A particular blend of interest groups is achieved through the selection process, and the table is not open to all citizens who may want to participate. In the open model, any citizen can participate and is expected to bring his/her individual mix of perspectives and interests to the table (Blahna and Yonts-Shepard 1989). The individual's participation is unfettered by a pre-determined role or interest that must be represented. This model is also called the "community of interests" approach (Sirmon et al. 1993, Thomas 1995).

Is one model superior to the other for achieving the aims and objectives of public participation in land and resources planning? This important question has potential to influence future planning processes in British Columbia and elsewhere. If one model is significantly better, that knowledge can be used to strengthen the role of citizens in promoting informed and responsible management. I decided to evaluate the two models using the experience of British Columbia in sub-regional (LRMP) planning as my case study.

LRMPs are "shared decision making" or "partnership" processes that are based on consensus building (Arnstein 1969; CORE 1992). The LRMP processes used both elected resource boards and planning teams to include public interests. The LRMP processes provide government with objectives and strategies for resource management zones within areas that are roughly the size for forest districts (Resource Planning Section 1993). Most LRMP areas contain one central community and a number of smaller communities (Resource Planning Section 1993).

In LRMP cases conducted thus far, some LRMP planning teams were filled by using open invitations to the public and other LRMP planning teams were filled by invitations to specific interest groups or sectors. Therefore, the LRMP process provided an opportunity to test the open and sectoral approaches for achieving representation on planning teams.

Study Objectives and Hypothesis

The purpose of this study was to compare the effectiveness of sectoral and open planning models in achieving the objectives of table members (social concerns) and the environmental goals established by government. Four LRMPs from the Prince George Forest Region of British Columbia, two that used an open approach and two that used the sectoral method, were selected as the case studies for comparison of the models. The objectives were as follows:

1. To document the experience and perceptions of citizens who participated on LRMP tables in selected communities of northern British Columbia.

2. To evaluate the effectiveness of the LRMP process in meeting social and environmental objectives established in "Land and Resource Management Planning: A Statement of Principles and Processes" (IRPC 1993).

3. To compare LRMP tables constructed on the "open" model with those constructed on the "sectoral" model with respect to social and environmental objectives.

The null hypothesis was that the models do not differ in their ability to address key social and ecological concerns in land use planning. Rejection of the null hypothesis would provide evidence that one model is superior to the other. This finding would be useful information for designing future public participation processes generally and for modifying future iterations of the LRMP process.

METHODS

Case Selection and Descriptions

The four LRMP cases were selected from the Prince George Forest Region, for two reasons. First, isolating the project to one forest region reduced the management component to a single Inter Agency Management Committee (IAMC). Second, the Prince George Forest Region uses only one official planning process (LRMP). Elsewhere in the province a similar process called the Commission on the Resources and Environment (CORE), which employed a commissioner to settle conflicts, was also used in strategic land use planning.

I reviewed the terms of reference for seven LRMP processes and questioned government planning staff to determine which model (open or sectoral) was used for each LRMP table. I found that two of the LRMP tables used an open method of public involvement (Prince George LRMP 1994, Vanderhoof LRMP 1994), and four used the representative approach (Dawson Creek LRMP 1994, Fort Nelson LRMP 1994, Fort St. John LRMP 1994, Robson Valley LRMP 1994). I selected the Prince George and Vandherhoof LRMPs as tables representing the open method, and the Dawson Creek, and Robson Valley LRMPs as tables representing the sectoral model. Prince George and Vanderhoof were selected because they are the only "open" processes in the Prince George region. The sectoral LRMPs were selected because of their proximity to the

City of Prince George. The LRMPs form a geographically compact study area that facilitated the interview portion of the study.

Geographically, the Dawson Creek LRMP lies on the eastern edge of the Rocky Mountains and extends eastward to the Alberta border along the foothills (Dawson Creek LRMP 1998). Forestry, agriculture, coal production, petroleum extraction, and electric power generation are important economic activities in the communities of the Dawson Creek LRMP area (Dawson Creek LRMP 1998). Dawson Creek, Chetwynd, Tumbler Ridge, and Hudson Hope are the largest communities in this LRMP area.

The area of the Prince George LRMP is bordered on the east by the western edge of the Rocky Mountains and extends westward along the interior plateau (Prince George LRMP 1998). The Prince George LRMP area relies on the forest sector as the dominant industry; however, the city of Prince George with a population over 70,000 provides the area with a more diversified economy than the other LRMP areas (Prince George LRMP 1998).

The area of the Vanderhoof LRMP borders on the east with the Prince George LRMP and lies in the central interior plateau. Forestry is a crucial employment sector and other important industries include agriculture, mining and tourism (Vanderhoof LRMP 1997). The largest communities are Vanderhoof and Fraser Lake (Vanderhoof LRMP 1997).

The area of the Robson Valley LRMP area is situated south east of the Prince George LRMP along the Fraser River and is bordered on the east and west by the Rocky Mountains (Robson Valley LRMP 1996). The two largest communities, McBride and Valemount, are dependent on forestry, agriculture and tourism (Robson Valley LRMP 1996).

Figure 1 and Table 1 provide locations and descriptions, respectively, of the LRMP areas used in the study.

Figure 1: Land and Resource Management Plan Case Study Areas

Scale
1: 10,000,000

Case Study Areas

- Dawson Creek
- Prince George
- Robson Valley
- Vanderhoof

British Columbia Land Use Planning Areas

November 25, 1998
Data Source: Land Use Coordination Office, Victoria, B.C.

Table 1. Description of LRMP areas used as study cases

	Prince George	Robson Valley	Vanderhoof	Dawson Creek
Gross Area (millions of ha)	3.42	1.3	1.38	2.9
Annual Allowable Cut (millions of m^3)	5.05	0.60	1.7	2.247
Population	83,259	4,000	10,000	30,000
Biogeoclimatic Zones:				
Alpine Tundra	X	X		X
Boreal White and Black Spruce				4
Englemann Spruce-Subalpine Fir	X	X	X	X
Interior Cedar-Hemlock	X	X		
Sub-boreal Spruce	X	X	X	X
Sub-boreal Pine Spruce			X	

Data obtained from Dawson Creek LRMP (1998), Prince George LRMP (1998), Robson Valley LRMP (1996), and Vanderhoof LRMP (1997), Holman and Trask (1996)

Development of Evaluative Criteria and Scales

Once the case study LRMPs were selected, the next step was development of criteria to test the null hypothesis. An examination of government policy outlined in the document "Land and Resource Management Planning: A Statement of Principles and Process" provided objectives and expectations for the conduct of LRMP processes (IRPC 1993). This document (IRPC 1993:20) stated that "Land and Resource Management Planning (LRMP) is consistent with the concepts of sustainability and integrated management presented by the B.C. round Table on the Environment and the Economy in the report *Towards a Strategy for Sustainability* (1992) and by the Commission on Resources and Environment (C.O.R.E.) in a *Report on a Land Use Strategy for British Columbia* (1992)." The objectives contained in these three documents were used to develop the social and environmental criteria for my evaluation.

Development of Social Criteria and Scales

CORE (1992:26) indicated "The key to success in shared decision-making lies in structuring the process so that it involves the participants in the design and development of the process itself, as well as in the negotiation of the substantive issues." Further, there is a requirement (IRPC 1993:3) that "All resource values are considered in the LRMP process to ensure that land use and resource management decisions are based on a comprehensive assessment of resource values." Assessment of resource values through the shared decision-making process, according to government guidelines, is supposed to be "meaningful" (Province of British Columbia 1993:1); i.e., "All participants must be confident that their opinions and values will be considered during the process and reflected in the final product" (Province of British Columbia 1993:4). A study involving the Dunes National Recreation Area prompted Daniels and Walker (1996:97) to note that an important feature of the collaborative learning process is that "... concerns are expressed, listened to, and meaningfully discussed." The participants must be included in discussion of substantive issues (Daniels and Walker 1996, Kaner et al. 1996). I sought to encapsulate these principles in my first social criterion: *Did participants have the opportunity to discuss issues that were meaningful?*

Citizens must be empowered or supported by the political process in order to effectively participate in planning exercises (Cortner and Shannon 1993). This includes provision of information such that citizens can participate on an equal footing with government and corporate interests (Forester 1989). Empowerment means that the interests of citizens are seriously considered in the planning process and that participants are given the technical and communication skills necessary to participate in the discussion of substantive issues (Daniels and Walker 1996, Wondolleck 1988). The use of language must allow participants to have an understanding of the information and issues discussed in the planning process (Cvetkovich and Earle 1994). Arnstein (1969:221) indicated that the power to negotiate these issues is arrived at by providing

citizens groups with "...resources to hire (and fire) [their] own technicians, lawyers, and community organizers." This principle, the ability of participants to negotiate on an equal footing, was embodied in my second social criterion: *Did participants feel empowered to discuss the meaningful issues?*

The Integrated Resource Planning Committee (1993:17) noted that LRMP products include "...a community forum that fosters better communication and understanding among local residents and government agencies..." and that "LRMP leads to expanded knowledge among local residents and agencies about their area's land and resources. It is a vehicle for education and the promotion of long-term participation in resource management." CORE (1992) also indicated that the process should foster a level of knowledge and communication among participants. Processes that foster better communication are important because they allow participants to develop relationships of mutual trust, respect, and understanding (Daniels and Walker 1996, Wondolleck 1988). These principles of shared learning were captured in my third and fourth social criteria: *Did the process result in improved communication among participants and an enhanced level of understanding about others' values?*

Table 2 summarizes my four social criteria and the attributes of each that are key in developing a successful "partnership" (Arnstein, 1969) for shared decision-making.

Table 2. Social criteria and attributes used to evaluate the effectiveness of open and sectoral models in Land and Resource Management Planning (LRMP)

Social Criteria	Attributes of Criteria
1) Inclusion by all participants in discussion of substantive issues	• able to express interests • interests heard • meaningful dialogue of participant's interests (Daniels and Walker 1996, Kaner et al. 1996)
2) Empowerment of participants to discuss meaningful issues	• training provided in negotiation/communication skills • training provided for technical aspects of resource analysis and planning so that all members are on an equal footing (Wondolleck 1988) • opposing views incorporated in the formulation of objectives and strategies for resource management zones (Wondolleck 1988). • use of language that will allow all members to identify problems and find solutions (Cvekovich & Earl 1994) • provision of enough information to make decisions
3) Improved communication with all LRMP members.	• improved relationships including trust and respect (Daniels and Walker 1996, Wondolleck 1988)
4) Enhanced level of understanding about other resource values	• improved awareness about interests of other members (Daniels and Walker 1996, Wondolleck 1988)

The null hypothesis required testing for differences in how well the individual and grouped (by model type) LRMPs addressed the social criteria. I developed an "agreement" scale to measure the degree of agreement around a specific statement (Spector 1992).

The instrument for social criteria was designed using a Likert scale to measure attributes related to the social criteria. A Likert (or agreement) scale was used because

the attitude being measured is controlled through a declarative statement (DeVilles 1991). I chose an even numbered scale because it forces participants to make a choice regarding success of the process in achieving goals. Respondents were asked to indicate if they strongly disagreed, disagreed, agreed, or strongly agreed to a declarative statement.

An odd numbered scale usually contains a neutral position for people who have no opinion or a neutral opinion (e.g. someone unfamiliar with the process); however, table members should have opinions about the success of the process in meeting social objectives because of their time commitment (at least three years) to the LRMP. I reasoned that, an even numbered scale should provide 'richer' data from the mail survey.

I developed a similar four point scale for the interview portion of the study. Extreme ends of the scale were used to identify clearly positive and negative statements about the LRMP process with respect to the social criteria. The middle two elements of the scale measured somewhat positive and negative comments about the process.

Development of Environmental Criteria and Scales

The Integrated Resource Planning Committee (1993:4) noted that achievement of social (and economic) goals for the LRMP partnership must be "...based on resource sustainability and integrated resource management ..." and this means that the "land use and resource management recommendations must be within the environmental capacity of the land to sustain use." The British Columbia Round Table on the Environment and the Economy (1992:6-7) and IRPC (1993:18) listed the following components of sustainability for the environment:

" (1) Limit human impact on the living world to stay within its carrying capacity (its ability to renew itself from natural and human impacts).

(2) Preserve and protect the environment (conserve life support systems, biological diversity, and renewable resources) ...

(4) Promote values that support sustainability (through information and education)."

The forgoing indicates that the shared-decision making process must be concerned with more than just the carrying capacity of ecosystems to produce some selected products or values. Land and resource management planning processes must also incorporate measures to preserve biodiversity and the supporting ecosystems. An important foundation for sustaining community interests is to sustain the integrity of the land base that supports life processes. Leopold (1970:190) noted that "The outstanding discovery of the twentieth century is not television, or radio, but rather the complexity of the land organism." Leopold's (1970) view was that all parts of the ecosystem are linked and we must be careful when we tinker with the "land organism" because "everything is connected to everything else"(Commoner in Noss and Cooperrider 1994:267). This concept was the basis for my first environmental criterion: *Were the impacts of proposed resource use scenarios discussed in terms of sustaining ecosystems? Did participants consider the impacts of planning decisions on the sustainability of the land base?*

The British Columbia Round Table on the Environment and the Economy (1991, 1992) noted that indicators must be developed to monitor effects of the plan. Noss (1993:32) wrote that "Every move toward sustainable forestry and sustainable forests is an experiment." Ecosystem sustainability is a goal of the LRMP process; therefore, "to track progress, one must be able to assess present environmental conditions in quantifiable terms and monitor changes in those conditions over time" (Noss 1993:33). These principles were the basis for my second environmental criterion: *Were measurable environmental indicators incorporated in the LRMP?*

The British Columbia government has adopted an overall 12% protected area strategy and has set specific targets for each LRMP. The literature indicates that

protective zones and connective corridors should be established in order to enhance the values (e.g. biodiversity) being conserved through protected areas (Hammond 1991, Hunter 1990, Noss and Cooperrider 1994). These considerations led to my third environmental criterion: *How did the LRMP consider strategies for protecting and enhancing biodiversity?* Disturbance processes and patterns are also noted as factors that should be considered by resource managers with respect to biodiversity conservation (Noss and Cooperrider, 1994). Hence my fourth environmental criterion: *How extensively has disturbance ecology been considered in the LRMP?*

Next, I required a framework to measure the success of each LRMP in achieving the above criteria. A matrix was derived (Table 3) to measure the extent to which the above criteria were addressed in each LRMP case. This matrix was used as a framework for measuring responses to environmental criteria in the mail survey and interview process. I also used the matrix to evaluate the extent to which environmental criteria were addressed within the documents (LRMP plans) produced in the four cases.

The null hypothesis required testing for differences in how well the individual and grouped (by model type) LRMPs addressed the environmental criteria. I developed an "evaluation" scale for the environmental questions in order to capture the respondents' opinions on how well the process considered the environmental criteria (Spector 1992:20).

Table 3. Matrix for measuring the degree to which Prince George, Robson Valley, Vanderhoof, and Dawson Creek LRMPs addressed environmental criteria

	Included in general plan guidelines	Part of resource management zone (RMZ)	Integration between RMZs	Considers areas adjacent to Plan area
Considers ecosystem sustainability impacts of resource use scenarios				
Developed criteria to monitor impacts of resource use				
Incorporates connective corridors or zones to enhance viability of protected values				
Concepts of disturbance ecology included in plan (patterns, processes)				
Goals and objectives to conserve biodiversity				

Environmental criteria were measured using an analog scale adapted to the environmental matrix (Table 3). Participants were asked to respond to each criterion by shading the matrix column to a level (percentage) which summarized their impression of how successful the LRMP process captured environmental goals. The scale ranged from 0% (no consideration of the environmental criterion) to 100% (the criterion was fully and successfully addressed). Respondents were asked to use the same scale to rate how well the LRMP process supplied table members with the appropriate level of knowledge to discuss relevant environmental issues. This instrument provided a metric that could easily be quantified for both aspects of the environmental evaluation.

I used the analog (percent scale) to measure environmental data in the mail survey; however, I used a four point scale to measure interview data. The four point scale is composed of two positive and two negative categories to measure participants' perception of how well the LRMP process met the environmental criteria. Extreme ends of the scale were used to identify clearly positive and negative statements and the middle two elements of the scale measured somewhat positive and negative comments.

I also used the environmental criteria matrix as a framework to review the LRMP documents (plans) produced by the four tables. I did not consider the number of times a criterion was mentioned in the plan to be a meaningful indicator of how well the criterion was addressed. Instead, I noted the presence or absence of a criterion in the plan, and noted its level of consideration as "specific," "general," "limited," or "none."

Data Collection, Preparation and Analysis

Mail surveys and interviews were conducted to increase the validity of findings through triangulation (Patton 1990, Yin 1994). Each LRMP was coded for data analysis and reporting, as follows:

LRMP CODE	LRMP CASE	MODEL TYPE
PGo	Prince George	open
RVs	Robson Valley	sectoral
VAo	Vanderhoof	open
DCs	Dawson Creek	sectoral

Mail Survey

The survey (appendix 1) consisted of four parts. An "Instructions and Information" page provided directions for completing the survey and requested responses to general questions. Participants were requested to indicate their gender, occupation and whether their participation in the LRMP was volunteer or paid. They were also asked how often they were able to attend LRMP meetings, what factors limited their ability to attend LRMP meetings, and the reason (if appropriate) for ending their participation in the process. Respondents were also requested to indicate their willingness to participate in the interview stage of the study. The other three components of the mail survey consisted of sections titled "Social Issues," "Environmental Issues Training" and "Environmental Issues."

The Social Issues survey was constructed using a Likert scale based on the 10 attributes of the social criteria listed in Table 2. Three declarative statements were prepared for each attribute (for a total of 30 questions) to provide internal validity. The survey was originally prepared with 4 statements per attribute; however, a respondent in pre-tests indicated that this version was excessively long and repetitive. The order of statements was randomized throughout the survey, and seven of the 30

statements were reversed in meaning to increase reliability of the survey results (Mangione 1995).

The Environmental Issues survey was based on the criteria and matrix shown in Table 3. Table members were asked to evaluate each criterion across four levels of consideration using an evaluative or percentile scale. The four levels of consideration were: 1) the criterion was mentioned only in the context of the general plan; 2) the criterion was addressed for individual RMZs; 3) the criterion was addressed with respect to issues or relationships that cross RMZ boundaries; and, 4) the criterion was addressed with respect to issues or relationships that extend into adjacent planning areas. The percent scale gave the participants a range of 0 to 100 for rating each criterion over the four levels of consideration.

An Environmental Issues Training component was included in the mail survey to evaluate how well participants were prepared to discuss environmental issues. The survey was constructed in the same way as the Environmental Issues survey.

The survey was directed to all participants in three LRMPs using lists obtained from forest district staff with the exception of those who had moved without providing a forwarding address. Arrangements were made with the Prince George Forest District to have the survey mailed by district staff. The survey included full time participants, alternates who had participated, and participants who had left the process.

As a data collection tool the mail survey has efficiencies in the ease of application, quantification of findings, and extension of the results. However, it has limitations with respect to analysis of intricate social issues, and is sensitive to sample selection and sample size (Marshall and Rossman 1995). The effect of sample size was mitigated by mailing the survey to all participants in each LRMP case with the exception of a few individuals who had moved.

Mangione (1995) suggested that a "total survey design" be used for a mail survey. This method involves an initial mailing followed by scheduled reminder

postcards to non-respondents, a follow up mailing of the original survey, and a final reminder postcard to remaining non-respondents. The initial mailing was conducted in late September, 1997, and a reminder letter was sent at the end of October. Further mailings were not conducted because of a postal strike and the time required to prepare and schedule follow up interviews.

Data collected from the mail survey was coded and entered into a computer spread sheet. A coding sheet was prepared for the social criteria based on the four possible responses for each statement. Twenty three affirmative statements were coded as follows: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The seven statements with reverse meaning were coded as 4 = strongly disagree, 3 = disagree, 2 = agree, and 1 = strongly agree. A few surveys were returned with responses spanning two of the four categories (e.g. between strongly disagree and disagree). The researcher has two choices; record the person's choice as undefineable, or record the entry in median values (1.5, 2.5, or 3.5). I chose to code such responses by using the median values. For the Environmental Issues and Environmental Issues Training questions, the percentages marked by respondents were entered on a computer spread sheet.

Data from the mail survey were analyzed using a non-parametric test of significance. Parametric statistical tests of significance can be used for ordinal data; however, parametric testing is not reliable when there are unequal variances and data do not fit a normal distribution (Cramer 1994). I used a distribution-free non-parametric statistic, the Kruskal-Wallis one-way analysis of variance, with a significance level of 5%, to determine if there were significant differences among the four LRMP cases. The Kruskal-Wallis test may indicate whether significant differences among cases but does not identify the sources of those differences (Siegel and Castellan 1988). Therefore, a multiple comparison test, described by Siegel and

Castellan (1988), was used to determine the source of the differences, as required to test the null hypothesis.

Interviews

The interviews involved one open-ended question (appendix 2) for each social, environmental, and environmental training criterion. Open ended questions were used because semi-structured interviews, if conducted properly, are a good device to validate data collected from the mail survey (Patton 1990). Open ended questions provide participants with a different medium for framing their responses, and can provide the researcher with richer and more detailed data than can be obtained from a mail survey alone. The interview form of data collection is dependent upon the skill of the interviewer (Marshall and Rossman 1995).

Semi-structured interviews with individuals from each LRMP were conducted to validate social and environmental data collected in the mail survey and document search. Participants were asked questions regarding the same criteria contained in the mail survey; however, there was only one open ended question for each criterion. All but three respondents of the mail survey were interviewed. One person could not be contacted, one individual decided not to be interviewed, and a third person was discovered not to be an official table member. A fourth person had indicated a desire to be interviewed in a letter attached to the mail survey, but this was not discovered until after the interviews were conducted.

People were contacted and a convenient meeting place was established. I asked each participant for permission to tape record the interview. All but two interviews were tape recorded. The participants were all asked the same questions and were allowed to provide as much detail as they wanted.

Interviews gave participants a chance to further define, clarify and validate information collected in the mail. The interviews also gave participants an opportunity

to talk about their experiences as table members and provide information on how to improve public participation processes.

Tape recordings of the interviews were transcribed. Responses were coded along with notes from the two interviews that were not tape recorded. The social criteria, environmental criteria, and environmental training criteria all used a four point coding system. Clear affirmative answers such as "good," "excellent," and "great" were assigned a value of 4. Three points were assigned to statements that were generally positive but less than clearly affirmative. Two points were awarded to statements that were generally negative, and one point was assigned to statements that were clearly negative. Provision was also made for median responses by coding in half values.

Interview data were analyzed using the same statistical tests used for the mail survey. The Kruskal-Wallis one-way analysis of variance, with a significance level of 5%, was used to determine if significant differences existed among the four LRMP cases. A multiple comparison test followed to determine the source of the differences (Siegel and Castellan 1988).

Document Review

The LRMP plans were evaluated as to whether they addressed each criterion, and at what level, within the environmental matrix (table 3). I used the matrix (Table 3) was used to rate the level of each criterion (general within the plan; by individual RMZ; between RMZs; or with respect to adjacent planning areas).

Corroboration of Information Sources

I reasoned that if differences were found in one source of information (documents, mail survey, or interviews), then it was equally important that the same difference be found in the other data sources before I could conclude that the two models of public participation were significantly different. Validation of detectable differences would require rejection of the null hypothesis, indicating that one model of public participation was more effective than the other model for the LRMP cases in this study. Therefore, I compared mail survey and interview results to see if results were similar.

Because similar four point scales were used for social criteria in both the mail surveys and interviews, I was able to use the Pearson correlation test (Zolman 1993) to determine correlation between the two data sets. This test could not be used for the environmental data because different scales were used.

RESULTS

Mail Surveys

Surveys were mailed to 49 Prince George, 36 Robson Valley, 38 Vanderhoof, and 42 Dawson Creek LRMP table members and the corresponding number of responses were 24, 20, 15, and 17. Responses included completed surveys, partially completed surveys, and incomplete surveys. Five surveys and responses were from non-table members who provided support to the various tables. The response rate from LRMP table members, including complete and partially complete surveys, were 45% from Prince George, 47% from Robson Valley, 34% from Vanderhoof, and 40% from Dawson Creek (Table 4).

Table 4 Mail survey response rates from LRMP participants for Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs)

LRMP	Complete	Partial	Incomplete	Non-Table	Table Responses	Total Mailed	Response Rate (%)
PGo	12	10	1	1	22	50	45
RVs	12	5	0	3	20	39	47
VAo	9	4	1	1	15	39	34
DCs	12	5	0	0	17	42	40
Total	45	24	2	5	76	170	42

*Complete: all fields were completed by the participant
*Partial: number of returns with one or more missing values
*Incomplete: survey returned but not completed by the participant
*Non-Table: participants that were support staff for the LRMP
*Table Responses: include both complete and partial returns
*Response Rate %: ((complete+partial)/(Total Mailed-Non-Table))*100

Participant Information

Mail survey participants provided information regarding gender, occupation of participants, and whether they were paid or volunteer table members. Fifty two to 54% of completed survey returns were from volunteer participants (Table 5). Forty to 46% of the returns were from people employed in the forestry sector. There was a relatively small number of responses from female table members in all cases (Table 5).

Social Criteria Responses Based on Mail Surveys

The Kruskal-Wallis mean ranks of the social criteria provide a relative comparison of the LRMP results (Table 6). These results show that the ranks for the inclusion criterion; were similar for the Dawson Creek, Vanderhoof, and Prince George LRMPs; Robson Valley participants ranked "inclusion" low relative to the other LRMPs. Vanderhoof had the highest rankings for the criteria pertaining to empowerment, communication, and understanding. As well, Vanderhoof LRMP

Table 5. Number of responses from mail survey by status of participation (volunteer or paid), job type, and gender for the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	LRMP	N Social Criteria	N Environmental Criteria	N Environmental Training Criteria
Participation Type				
Paid	PGo	6	6	6
Volunteer	PGo	10	8	9
Paid	RVs	7	6	5
Volunteer	RVs	7	7	6
Paid	VAo	3	3	3
Volunteer	VAo	5	5	7
Paid	DCs	8	9	9
Volunteer	DCs	5	6	5
Paid	Total	24	24	23
Volunteer	Total	27	26	27
Job Type				
Other	PGo	7	7	8
Forestry	PGo	10	8	7
Other	RVs	8	7	7
Forestry	RVs	7	7	5
Other	VAo	7	6	8
Forestry	VAo	4	4	4
Other	DCs	8	10	9
Forestry	DCs	5	5	5
Other	Total	30	30	32
Forestry	Total	26	24	21
Gender				
female	PGo	2	2	2
male	PGo	15	13	13
female	RVs	3	3	3
male	RVs	12	11	9
female	VAo	2	1	2
male	VAo	9	9	10
female	DCs	2	2	2
male	DCs	11	13	12
female	Total	9	8	9
male	Total	47	46	44

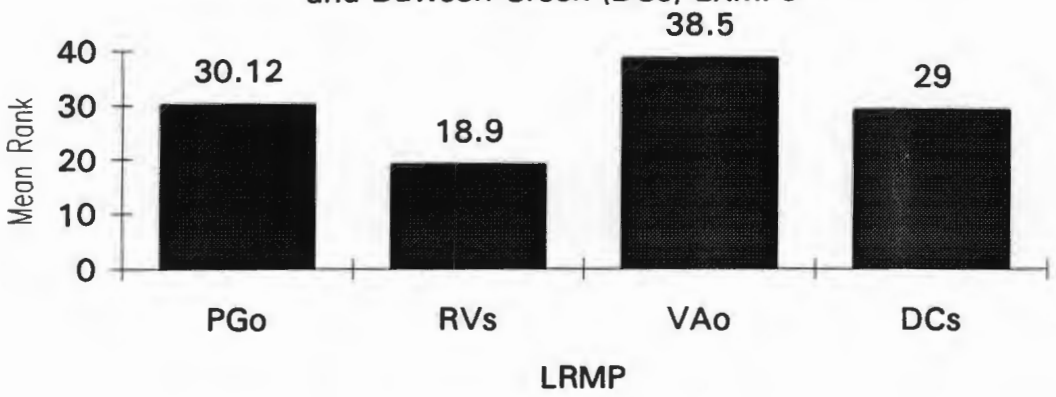
* figures in the above table are from table members who provided complete answers for the specific survey: social, environmental, or environmental training.

showed higher rankings for the communication and understanding criteria than did the other cases. Robson Valley had the lowest scores for all criteria except empowerment, for which it ranked second. Generally the open cases (Prince George and Vanderhoof) had higher rankings for the combined social criteria than the sectoral cases (Robson Valley and Dawson Creek) (Figure 2).

Table 6. Kruskal-Wallis mean ranks of social criteria from the mail survey of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

Criterion	LRMP	N	Mean Rank
Inclusion	PGo	19	32.53
	RVs	15	19.33
	VAo	12	35.29
	DCs	14	35.61
	Total	60	
Empowerment	PGo	18	23.11
	RVs	16	33.06
	VAo	11	38.64
	DCs	13	26.23
	Total	58	
Communication	PGo	22	35.50
	RVs	16	18.75
	VAo	13	45.19
	DCs	15	36.17
	Total	66	
Understanding	PGo	21	33.76
	RVs	16	23.88
	VAo	13	45.31
	DCs	16	33.19
	Total	66	
Combined Criteria	PGo	17	30.12
	RVs	15	18.90
	VAo	11	38.50
	DCs	13	29.00
	Total	56	

Figure 2. Kruskal-Wallis mean ranks of combined social criteria from mail survey of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs



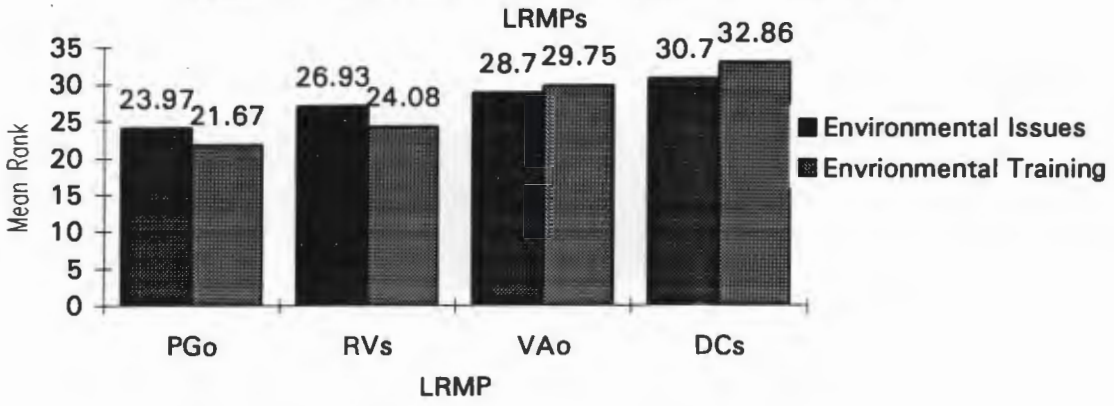
Environmental Criteria Responses Based on Mail Surveys

Mail responses from LRMP table members produced similar results in the Kruskal-Wallis mean ranks for the five environmental criteria (Table 7). The order (highest to lowest) of scores for the combined environmental criteria were: Dawson Creek, Vanderhoof, Robson Valley, and Prince George (Figure 3). The same relative pattern of rankings resulted for the combined environmental training criteria (Figure 3).

Table 7. Kruskal-Wallis mean ranks of environmental and environmental training criteria from mail survey of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	Environmental			Environmental Training		
Criterion	LRMP	N	Mean Rank	LRMP	N	Mean Rank
Biodiversity	PGo	20	26.35	PGo	19	26.74
	RVs	15	34.47	RVs	14	28.50
	VAo	13	36.04	VAo	12	32.13
	DCs	15	33.57	DCs	15	35.83
	Total	63		Total	60	
Impacts	PGo	18	26.78	PGo	18	28.44
	RVs	14	29.93	RVs	14	27.36
	VAo	13	32.58	VAo	13	33.38
	DCs	15	33.70	DCs	14	31.50
	Total	60		Total	59	
Corridors/Zones	PGo	19	23.63	PGo	17	23.97
	RVs	15	34.13	RVs	14	33.43
	VAo	11	31.50	VAo	12	28.88
	DCs	15	34.83	DCs	15	32.60
	Total	60		Total	58	
Monitoring	PGo	16	25.78	PGo	18	23.19
	RVs	14	26.07	RVs	15	31.80
	VAo	12	27.83	VAo	12	32.38
	DCs	15	36.10	DCs	15	36.47
	Total	57		Total	60	
Disturbance	PGo	20	30.22	PGo	18	26.75
	RVs	15	29.40	RVs	15	26.73
	VAo	12	33.13	VAo	13	39.08
	DCs	15	29.83	DCs	15	33.37
	Total	62		Total	61	
Combined Criteria	PGo	15	23.97	PGo	15	21.67
	RVs	14	26.93	RVs	12	24.08
	VAo	10	28.70	VAo	12	29.75
	DCs	15	30.77	DCs	14	32.86
	Total	54		Total	53	

Figure 3. Kruskal-Wallis mean ranks of combined environmental criteria from mail survey of participants in the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs)



Kruskal-Wallis Tests of Significance

Social Criteria

The Kruskal-Wallis test of the null hypothesis (Ho: do the models differ) produced significant results for four of five social criteria (Table 8). Significant differences ($p=0.05$) among the four LRMPs resulted for the inclusion, communication, and understanding criteria. A multiple comparison test of the Kruskal-Wallis mean ranks for the inclusion criterion revealed that the open cases (Prince George and Vanderhoof) and the Dawson Creek LRMP had significantly higher scores than the Robson Valley LRMP for engaging table members in meaningful discussion (Table 9). No significant differences were found for the inclusion criterion between the Dawson Creek, Prince George, and Vanderhoof cases. The Kruskal-Wallis test (Table 8) did not show significant differences between the open and sectoral models for the empowerment criterion.

Table 8. Kruskal-Wallis test of significance for social criteria from mail survey based on results from the Prince George, Robson Valley, Vanderhoof, and Dawson Creek LRMPs

Criteria	Chi-Square	df	Asymp. Sig.
Inclusion	8.569	3	0.036
Empowerment	7.027	3	0.071
Communication	15.330	3	0.002
Understanding	9.350	3	0.025
Combined Criteria	9.514	3	0.023

Chi-Square > 7.82 is significant at the 0.05 level for a two tailed test
Chi-Square > 6.25 is significant at the 0.10 level for a two tailed test

The mail survey data for the communication criterion produced significant differences for five of six possible LRMP pairings. Both open cases (Prince George and Vanderhoof) and the Dawson Creek LRMP scored higher than the Robson Valley LRMP for improving communication among table members. The results also indicate that Vanderhoof LRMP had significantly higher ratings than Dawson Creek and Prince George for this criterion.

Mail survey results for the understanding criterion produced significant differences for the same five LRMP pairs as the communication criterion. The Vanderhoof LRMP (open model) had significantly higher scores than both sectoral cases (Robson Valley and Dawson Creek) and the Prince George LRMP (open model) with respect to enhancing understanding of others' values.

The combined social criteria (Table 6) suggest that both open LRMPs have higher results than the two sectoral LRMPs; however, only the Vanderhoof LRMP produced a statistically significant difference. The Prince George and Dawson Creek LRMPs have significantly higher scores than Robson Valley LRMP for the combined criteria (Tables 6 and 9).

Table 9. Multiple comparisons between LRMPs for social criteria from mail survey of the participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

Criterion	LRMP Comparisons	Absolute Difference Between Mean Ranks *	Critical Difference**
Inclusion	PGo vs RVs	13.20	9.073
	PGo vs VAo	2.76	8.843
	PGo vs DCs	3.08	8.984
	RVs vs VAo	15.96	8.109
	RVs vs DCs	16.28	8.347
	VAo vs DCs	0.32	7.938
Communication	PGo vs RVs	16.75	9.632
	PGo vs VAo	9.69	9.456
	PGo vs DCs	0.67	9.561
	RVs vs VAo	26.44	8.387
	RVs vs DCs	17.42	8.620
	VAo vs DCs	9.02	8.228
Understanding	PGo vs RVs	9.88	9.476
	PGo vs VAo	11.55	9.270
	PGo vs DCs	0.57	9.476
	RVs vs VAo	21.43	8.387
	RVs vs DCs	9.31	8.749
	VAo vs DCs	12.12	8.387
Combined Criteria	PGo vs RVs	11.22	8.766
	PGo vs VAo	8.38	8.397
	PGo vs DCs	1.12	8.556
	RVs vs VAo	19.60	8.009
	RVs vs DCs	10.10	8.223
	VAo vs DCs	9.50	7.642

* Absolute difference between mean ranks as determined by the Kruskal-Wallis Test from Table 6

** Critical difference determined for 2-tailed test at a significance level of 0.05.

Absolute difference > Critical Difference indicates a significant difference between the two groups.

Environmental Criteria

The Kruskal-Wallis tests do not support rejection of the null hypothesis that model type makes no difference in achieving environmental objectives of government

(Table 10). Similarly, there were no significant differences among cases for the individual environmental training criteria or for the combined environmental and environmental training criteria.

Table 10. Kruskal-Wallis test of significance for environmental and environmental training criteria from mail survey of participants from the Prince George, Robson Valley, Vanderhoof, and Dawson Creek LRMPs

	Environmental			Environmental Training		
Criteria	Chi-Square	df	Asymp. Sig.	Chi-Square	df	Asymp. Sig.
Biodiversity	2.913	3	0.405	2.570	3	0.463
Impacts	1.521	3	0.678	1.091	3	0.779
Corridors/Zones	4.550	3	0.208	3.104	3	0.376
Monitoring	3.845	3	0.279	5.128	3	0.163
Disturbance	0.444	3	0.931	4.877	3	0.181
Combined Criteria	1.480	3	0.687	4.611	3	0.203

Chi-Square > 7.82 is significant at the 0.05 level for a two tailed test
Chi-Square > 6.25 is significant at the 0.10 level for a two tailed test

Social Criteria and Participant Data

Participant data for job type, and status of participation (paid or volunteer) was used in conjunction with the combined social criteria to determine if there were significant differences, at the 5% level of significance, within each LRMP. No significant differences were found for job type (forestry and other occupations) and gender; however, significant differences were found between paid and volunteer table members with respect to satisfaction of social criteria (Table 11).

The multiple comparison test (Table 12) showed significant differences in how paid versus volunteer representatives evaluated social criteria for the Dawson Creek, Robson Valley, and Vanderhoof LRMPs. In these cases, paid table members rated the process significantly higher than volunteer table members for capturing the interests of table members.

Table 11. Kruskal-Wallis mean ranks of combined social criteria by status of participation, job type, and gender based on mail survey data from participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	LRMP	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Participation Status						
Paid	PGo	6	23.92			
Volunteer	PGo	10	29.60			
Paid	RVs	7	23.57			
Volunteer	RVs	7	11.36			
Paid	VAo	3	40.67			
Volunteer	VAo	5	32.80			
Paid	DCs	8	33.69			
Volunteer	DCs	5	17.30			
	Total	51		15.505	7	0.030
Job Type						
Other	PGo	7	31.57			
Forestry	PGo	10	29.10			
Other	RVs	8	18.31			
Forestry	RVs	7	19.57			
Other	VAo	7	39.36			
Forestry	VAo	4	37.00			
Other	DCs	8	26.81			
Forestry	DCs	5	32.50			
	Total	58		10.058	7	0.185
Gender						
female	PGo	2	24.50			
male	PGo	15	30.87			
female	RVs	3	11.00			
male	RVs	12	20.88			
female	VAo	2	32.50			
male	VAo	9	39.83			
female	DCs	2	37.25			
male	DCs	11	27.50			
	Total	66		11.599	7	0.115

Chi-Square > 14.07 is significant at the 0.05 level for a two tailed test
Chi-Square > 12.02 is significant at the 0.10 level for a two tailed test

Table 12. Multiple comparisons of paid and volunteer groups for combined social criteria from mail survey of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

LRMP	Absolute Difference Between Mean Ranks for Mail Survey*	Critical Difference for Mail Survey**
PGo	5.68	7.683
RVs	12.21	6.988
VAo	7.87	5.590
DCs	16.39	6.938

* Absolute difference between mean ranks as determined by the Kruskal-Wallis Test from Table 11

** Critical difference determined for 2-tailed test at a significance level of 0.05.

Absolute difference > Critical Difference indicates a significant difference between the two groups.

Environmental Criteria and Participant Data

Participant data for job type, and status of participation (paid or volunteer) was also used in conjunction with the combined environmental and environmental training criteria to determine if there were significant differences, at the 5% level of significance, within each LRMP. The Kruskal- Wallis test found no significant differences in the combined environmental or environmental training criteria for job type (forestry and other occupations), gender, and paid versus volunteer status (Tables 13 and 14).

Table 13. Kruskal-Wallis mean ranks of environmental criteria by status of participation, job type, and gender based on mail survey data from participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	LRMP	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Participation Type						
Paid	PGo	6	18.25			
Volunteer	PGo	8	24.75			
Paid	RVs	6	31.92			
Volunteer	RVs	7	17.29			
Paid	VAo	3	28.33			
Volunteer	VAo	5	28.60			
Paid	DCs	9	33.94			
Volunteer	DCs	6	20.25			
	Total	50		9.030	7	0.251
Job Type						
Other	PGo	7	31.57			
Forestry	PGo	8	29.10			
Other	RVs	7	18.31			
Forestry	RVs	7	19.57			
Other	VAo	6	39.36			
Forestry	VAo	4	37.00			
Other	DCs	10	26.81			
Forestry	DCs	5	32.50			
	Total	54		2.838	7	0.900
Gender						
female	PGo	2	23.00			
male	PGo	13	24.12			
female	RVs	3	25.33			
male	RVs	11	27.36			
female	VAo	1	6.00			
male	VAo	9	31.22			
female	DCs	2	19.50			
male	DCs	13	32.50			
	Total	50		5.026	7	0.657

Chi-Square > 14.07 is significant at the 0.05 level for a two tailed test
Chi-Square > 12.02 is significant at the 0.10 level for a two tailed test

Table 14. Kruskal-Wallis mean ranks of environmental training criteria by status of participation, job type, and gender based on mail survey data from participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

Criteria		LRMP	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Participation Type							
	Paid	PGo	6	16.50			
	Volunteer	PGo	9	23.33			
	Paid	RVs	5	29.00			
	Volunteer	RVs	6	15.17			
	Paid	VAo	3	31.00			
	Volunteer	VAo	7	29.00			
	Paid	DCs	9	31.44			
	Volunteer	DCs	5	30.20			
		Total	50		8.636	7	0.251
Job Type							
	Other	PGo	8	22.50			
	Forestry	PGo	7	20.71			
	Other	RVs	7	19.43			
	Forestry	RVs	5	30.60			
	Other	VAo	8	31.50			
	Forestry	VAo	4	26.25			
	Other	DCs	9	31.22			
	Forestry	DCs	5	35.80			
		Total	53		6.778	7	0.452
Gender							
	female	PGo	2	29.00			
	male	PGo	13	20.54			
	female	RVs	3	25.00			
	male	RVs	9	23.78			
	female	VAo	2	7.50			
	male	VAo	10	34.20			
	female	DCs	2	17.00			
	male	DCs	12	35.50			
		Total	53		10.290	7	0.083

Chi-Square > 14.07 is significant at the 0.05 level for a two tailed test
Chi-Square > 12.02 is significant at the 0.10 level for a two tailed test

Interviews

Social Criteria Responses Based on Interviews

Ten table members from the Prince George LRMP, seven from the Robson Valley LRMP, eight from the Vanderhoof LRMP, and nine from the Dawson Creek LRMP were interviewed. Interview results indicated that the open cases, Vanderhoof and Prince George, were ranked first and second for all social criteria except understanding (Table 15). Dawson Creek ranked first, Vanderhoof second, Prince George third, and Robson Valley last for the understanding criterion. Results for the open cases (Prince George and Vanderhoof) are also higher for the combined social criteria than the two sectoral cases (Figure 4).

Figure 4. Kruskal-Wallis mean ranks of combined social criteria based on interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

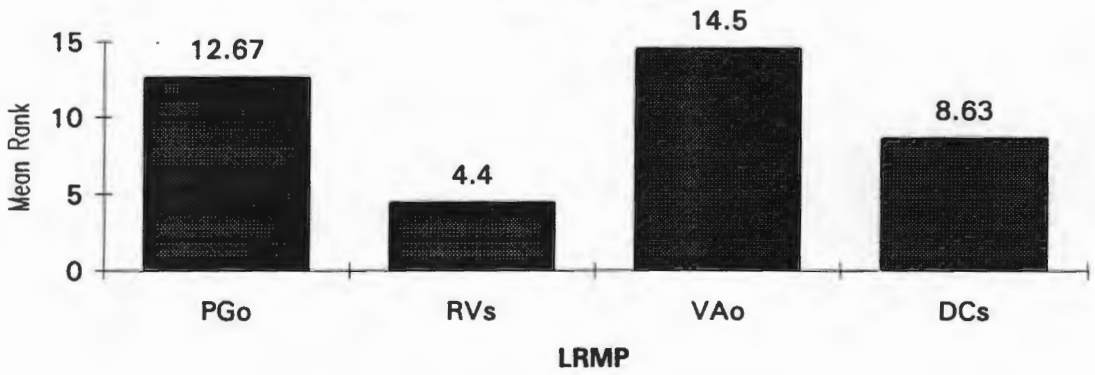


Table 15. Kruskal-Wallis mean ranks of social criteria based on interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

Criteria	LRMP	N	Mean Rank
Inclusion	PGo	8	17.88
	RVs	7	12.21
	VAo	8	21.56
	DCs	8	11.88
	Total	31	
Empowerment	PGo	4	13.50
	RVs	5	5.70
	VAo	6	18.25
	DCs	7	8.71
	Total	22	
Communication	PGo	10	18.95
	RVs	7	9.71
	VAo	6	24.17
	DCs	9	13.94
	Total	32	
Understanding	PGo	9	17.22
	RVs	7	11.00
	VAo	8	19.13
	DCs	9	19.56
	Total	33	
Combined Criteria	PGo	3	12.67
	RVs	5	4.40
	VAo	4	14.50
	DCs	6	8.63
	Total	18	

Environmental Criteria Responses Based on Interviews

Interviews of LRMP table members yielded a narrow range of results for most environmental criteria (Table 16). The disturbance criterion produced the largest range in results with over a 10 point spread in the Kruskal-Wallis mean ranks (Prince George and Robson Valley). The combined environmental criteria provided a small spread among the cases for the Kruskal-Wallis mean ranks (Table 16, Figure 5). Robson

Valley results were consistently at the low end of the range for all environmental criteria.

A closer range of scores was provided by interview participants for the environmental training criteria, with the exception of the disturbance training criterion, than the environmental criteria (Table 16). The combined environmental training criteria also shows a uniformity in the results of the Kruskal-Wallis mean ranks (Table 16, Figure 5). The disturbance training criterion yielded a 13 point range in the mean ranks between top and bottom cases (Prince George and Robson Valley). It is interesting to note that Robson Valley interview participants produced the lowest rank for the biodiversity criterion while providing the highest rank for the biodiversity training criterion (Table 16).

Figure 5. Kruskal-Wallis mean ranks of combined environmental criteria from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

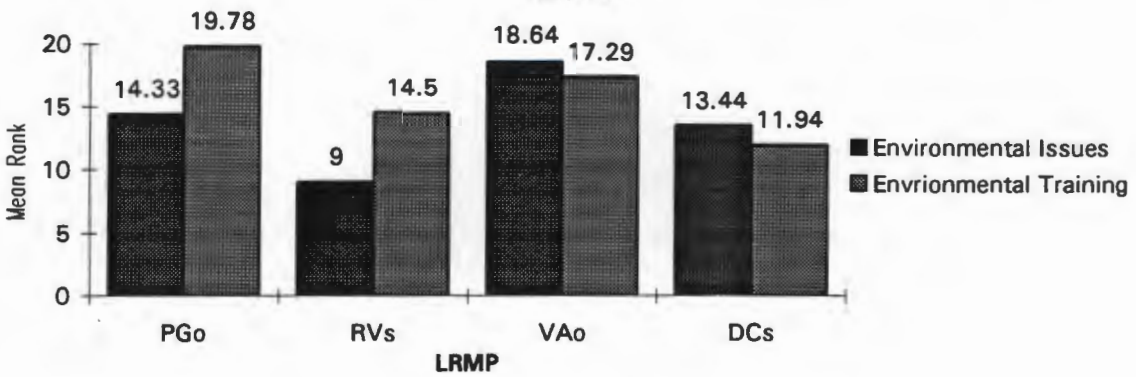


Table 16. Kruskal-Wallis mean ranks of environmental and environmental training criteria from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs)

	Environmental			Environmental Training		
Criteria	LRMP	N	Mean Rank	LRMP	N	Mean Rank
Biodiversity	PGo	10	15.30	PGo	9	16.78
	RVs	6	9.75	RVs	7	21.07
	VAo	7	19.29	VAo	8	18.44
	DCs	8	18.69	DCs	9	12.78
	Total	31		Total	33	
Impacts	PGo	8	16.38	PGo	9	17.00
	RVs	7	14.43	RVs	7	14.21
	VAo	8	18.38	VAo	7	18.36
	DCs	9	16.56	DCs	9	16.33
	Total	32		Total	32	
Corridors/Zones	PGo	8	16.63	PGo	9	18.39
	RVs	7	12.36	RVs	7	14.29
	VAo	8	21.13	VAo	8	17.50
	DCs	9	15.50	DCs	9	17.28
	Total	32		Total	33	
Monitoring	PGo	10	17.90	PGo	9	17.00
	RVs	7	14.21	RVs	7	16.29
	VAo	8	16.44	VAo	8	16.31
	DCs	9	20.56	DCs	9	18.17
	Total	34		Total	33	
Disturbance	PGo	8	20.75	PGo	9	23.22
	RVs	7	10.64	RVs	7	10.21
	VAo	8	20.38	VAo	8	18.81
	DCs	9	13.83	DCs	8	12.13
	Total	32		Total	32	
Combined Criteria	PGo	6	14.33	PGo	9	19.78
	RVs	6	9.00	RVs	7	14.50
	VAo	7	18.64	VAo	7	17.29
	DCs	8	13.44	DCs	8	11.94
	Total	27		Total	31	

Kruskal-Wallis Tests of Significance

Social Criteria

The Kruskal-Wallis test of the hypothesis indicates significant differences, at the 5% level of significance, for the empowerment, communication, and the combined social criteria (Table 17). The multiple comparison tests (Tables 15 and 18) indicates that the open cases, Prince George and Vanderhoof, have significantly higher scores than the Robson Valley LRMP for the empowerment, communication, and combined social criteria. Results for the Vanderhoof LRMP are also significantly higher than the Dawson Creek LRMP for these criteria.

Environmental Criteria

Kruskal-Wallis test results indicate that there were significant differences for the disturbance training criterion (Table 19). No other significant differences were found for either the environmental or environmental training criteria. The multiple comparison test results (Table 20) show that both open cases (Prince George and Vanderhoof) had significantly higher results than the two sectoral cases (Dawson Creek and Robson Valley) for the disturbance training criterion.

Table 17. Kruskal-Wallis test of significance for social criteria from interviews of participants of the Prince George, Robson Valley, Vanderhoof, and Dawson Creek LRMPs

Criteria	Chi-Square	df	Asymp. Sig.
Inclusion	6.375	3	0.095
Empowerment	12.230	3	0.007
Communication	9.369	3	0.025
Understanding	5.195	3	0.158
Combined Criteria	9.221	3	0.026

Chi-Square > 7.82 is significant at the 0.05 level for a two tailed test
Chi-Square > 6.25 is significant at the 0.10 level for a two tailed test

Table 18. Multiple comparisons between LRMPs for social criteria from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

Criteria	LRMP Comparisons	Absolute Difference Between Mean Ranks*	Critical Difference**
Empowerment	PGo vs RVs	7.80	4.846
	PGo vs VAo	4.75	5.156
	PGo vs DCs	4.79	5.438
	RVs vs VAo	12.55	5.298
	RVs vs DCs	3.01	5.569
	VAo vs DCs	9.54	5.292
Communication	PGo vs RVs	9.24	6.565
	PGo vs VAo	5.22	6.487
	PGo vs DCs	5.01	6.821
	RVs vs VAo	14.46	5.716
	RVs vs DCs	4.23	6.329
	VAo vs DCs	10.23	6.619
Combined Criteria	PGo vs RVs	8.27	4.719
	PGo vs VAo	1.83	4.352
	PGo vs DCs	4.04	5.108
	RVs vs VAo	10.10	4.846
	RVs vs DCs	4.23	5.298
	VAo vs DCs	5.87	5.648

* Absolute difference between mean ranks as determined by the Kruskal-Wallis Test from Table 15

** Critical difference determined for 2-tailed test at a significance level of 0.05.

Absolute difference > Critical Difference indicates a significant difference between the two groups.

Table 19. Kruskal-Wallis test of significance for environmental and environmental training criteria from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	Environmental Criteria			Environmental Training Criteria		
Criteria	Chi-Square	df	Asymp. Sig.	Chi-Square	df	Asymp. Sig.
Biodiversity	5.056	3	0.168	3.031	3	0.387
Impacts	0.775	3	0.856	0.919	3	0.821
Corridors/Zones	4.000	3	0.261	0.896	3	0.827
Monitoring	2.033	3	0.566	0.253	3	0.969
Disturbance	6.886	3	0.076	11.209	3	0.011
Combined Criteria	4.911	3	0.178	3.583	3	0.310

Chi-Square > 7.82 is significant at the 0.05 level for a two tailed test
Chi-Square > 6.25 is significant at the 0.10 level for a two tailed test

Table 20. Multiple comparisons of mean ranks of the environmental training disturbance criterion from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

	LRMP Comparisons	Absolute Difference Between Mean Ranks for Interviews	Critical Difference for Interviews
Disturbance	PGo vs RVs	13.01	6.329
	PGo vs VAo	4.41	6.473
	PGo vs DCs	11.09	6.473
	RVs vs VAo	8.60	6.106
	RVs vs DCs	1.92	6.106
	VAo vs DCs	6.68	5.899

* Absolute difference between mean ranks as determined by the Kruskal-Wallis Test from Table 16
** Critical difference determined for 2-tailed test at a significance level of 0.05.
Absolute difference > Critical Difference indicates a significant difference between the two groups.

Participant Responses

One of the study objectives was to document the experiences of LRMP table members. Participants provided voluntary comments in both the mail survey and interview components of the study. Oral and written comments were divided into five main categories: process facilitator, political direction, process, interest based negotiation training, table make-up, and information.

Comments about the Process Facilitator

Although no specific questions addressed the topic of a meeting facilitator, 54% of the people interviewed volunteered comments about the facilitator (usually the table chair) with respect to the process (Table 21).

Table 21. Number of comments from interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs about the importance of the process facilitator

LRMP	Number of interviews	Number responses	Number positive responses	Number negative responses
PGo & VAo	18	12	12	3
RVs & DCs	17	7	2	5
All	35	19	14	8

The open cases (Prince George and Vanderhoof) provided more positive comments about the group facilitator's role in keeping the process on track and in achieving consensus. The following factors were considered important activities or functions of the chair (the number of people offering this opinion is included in parentheses):

- Chair prevented domination by interest groups (1-PGo, 1-VAo, 1-DCs).
- Chair made it comfortable for people to ask for explanations(1-PGo).
- Chair ensured everyone understood (1-DCs).
- Chair ensured that everyone was heard (2-PGo,2-VAo, 1-DCs).
- Chair would organize plan for meeting (1-PGo).
- Information for meeting would go through chair (1-VAo).
- Chair would obtain explanations and information for table members (3-PGo, 2-VAo).
- Chair would remind table members about the principles of interest based negotiation (1-VAo).
- Chair would let people know how to be on topic (1-PGo).
- Chair would not let the process become personal (1-PGo, 1-VAo).
- Chair made sure that time line was met (1-DCs).

The following is a summary of concerns about the chair's role and activities:

- Chair should be independent of government (1-RVs).
- There should be co-chairs with one chair selected by table members and the other by government (1-PGo).
- No training was provided to help chair be effective in that role (1-DCs).
- Chair stopped the discussion too quickly when there was controversy (1-VAo, 1-DCs).
- Chair did not adhere to his own process (1-DCs).
- Chair did not want the LRMP process (1-DCs).
- Chair tried to lead process in a specific direction (1-PGo).
- Chair restrictions were not acceptable to group (1-PGo).
- There was inconsistency because chairs changed during the process (1-DCs).

Comments about Political Direction

Seventy-one% of the people interviewed commented about the political direction or agenda of government, and 26% also indicated a concern about rules being changed during the LRMP process (Table 22). Four people commented on the lack of ground rules at the beginning of the process; however, many of the concerns about changing rules related to the environmental criteria as discussed below.

Table 22. Number of participants who responded (Resp.) on issues of political direction and changing rules out of total numbers interviewed (N) from the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo) and Dawson Creek (DCs) LRMPs

Issue	LRMP	N	Resp.
Political Direction	PGo	10	7
	RVs	8	6
	VAo	8	7
	DCs	9	5
	All	35	25
Rules Changed	PGo	10	0
	RVs	8	4
	VAo	8	2
	DCs	9	3
	All	35	9

LRMP participants were particularly concerned about the government Biodiversity Guidebook (Province of British Columbia 1995), protected areas, and special management zones (SMZs). The Biodiversity Guidebook contains rules regarding how much area, by biogeoclimatic classification, can be managed as high, medium, and low biodiversity (Province of British Columbia 1995). Government also established the percentage of land base in each LRMP that could be set aside from industrial resource development as protected area. The following summarizes concerns of table members regarding these issues.

- More than half the LRMP process occurred without biodiversity rules (1-VAo).
- Government changed the biodiversity rules (1-DCs).
- Government biodiversity policy was problematic (5-RVs, 1-DCs).
- The amount of protected area that government would allow for the LRMP area was a concern (1-PGo, 3-RVs, 1-VAo, 2-DCs).
- Government changed the protected area allotments during the LRMP process (1-PGo, 2-RVs, 1-DCs).
- The rules changed for special management zones (SMZ) (1-RVs, 1-VAo).

Comments about the LRMP Process

Interview participants made specific comments about the process and provided opinions on what areas could be improved. Comments included concern about the role of government and participants as follows:

- Government should reiterate policy but not hold a position.
- Role of government should be clearly defined.
- Participants should be accountable for their actions as table members.
- Role of participants should be clearly defined at the outset of the planning process.
- Inter-Agency Management Committee and others were not consistent

Participants' assessments of the LRMP process overall provided both positive and negative comments. Table members from the Vanderhoof and Prince George LRMPs (the two open cases) provided a higher percentage of positive responses than the two sectoral cases, Dawson Creek and Robson Valley (Table 23).

Table 23. Number and percentage of interview participants from Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs who provided positive (Pos.), negative (Neg.), and neutral (Neu.) responses to a question about the LRMP concept and process

LRMP Table	N	Pos.	Pos. (%)	Neg.	Neg. (%)	Neut.	Neut. (%)
PGo	10	7.0	70.0	1.0	10.0	2.0	20.0
RVs	7	4.0	57.1	3.0	42.9	0.0	00.0
VAo	8	7.0	87.5	1.0	12.5	0.0	00.0
DCs	9	5.0	55.6	4.0	44.4	0.0	00.0
All	34	23.0	67.6	9.0	26.5	2.0	05.9

The four LRMP processes varied in duration from 2.5 years for Vanderhoof to over 5 years for Dawson Creek. Some participants expressed concerns about the requirements of the LRMP process, as follows:

- Length of process wears you out.
- Process was too long.
- Process needs time line.
- Process had long days of 11-12 hours which wears you down.
- We were pushed for time in discussing some issues.
- Unlike paid industry representatives, volunteers have to work and don't have the time necessary to properly prepare for discussions.
- The "average" person is not involved because of time commitment.

Other process related issues identified by interview participants included the following:

- Agencies need to work together.
- Changes noted from the previous meeting should be highlighted (necessitated because government sometimes changed the meeting notes).
- Minutes were not always provided in a timely fashion.

- Objectives and strategies were changed by the Inter Agency Planning Team.

Comments about Negotiation Training

Six Robson Valley and 9 Vanderhoof table members indicated that interest based negotiation training was provided for their LRMP processes. Eight Dawson Creek and 4 Prince George table members noted that their table was not provided with this training. Although the effectiveness of such training is unclear, Robson Valley LRMP members offered the following views about interest-based negotiation training:

- Some chose not to attend the training sessions.
- Training was not repeated for people who missed the initial offering.
- Training was not provided early enough in the process.
- Not enough training was provided.
- Training should be a requirement for all table members.

Vanderhoof table members commented that negotiation training was at the right time and that people did not want too much training. Table members from Prince George and Dawson Creek LRMPs, where no formal training was provided, made the following comments:

- Training was given to key government members only.
- Negotiation and consensus were discussed, although formal training was lacking.
- Interest based negotiation training is desirable.
- The process may have been better with negotiation training.

Comments on Information Resources

When table members were interviewed about how well their interests were captured, 44% indicated that the amount of information was satisfactory, 24% indicated that there was too much information, and 20% indicated that there was not enough

information. Specific comments (positive and negative) reveal a diversity of opinion about information resources available to table members, as follows:

- LRMP represented a source of local knowledge.
- Information provided to the process was good.
- Table members were provided with a book containing a statement of interests of the table members as well as a glossary of terms.
- Confusing terms were explained.
- There were some good speakers.
- Information was presented if available.
- Resources were available to organized interest groups but not to ordinary table members.
- Forest companies were hesitant to share information.
- There was not enough information.
- Information was not readily available.
- There was too much information.
- Baseline or quality information was lacking.
- Government information was not available to table members.
- Information at times was too technical.

Comments on Table Composition

A few offered positive comments about the make-up of the LRMP tables. One Prince George table member reported a good balance of participants. A Dawson Creek table member thought that the municipal representatives could adequately represent the interests of citizens not at the LRMP table. However, ability of the LRMP processes to effectively represent the interests of local residents (including those not at the table) was a concern for some table members. Comments to this effect included:

- Broader public representation is needed.

- Affected people need to be involved.
- Opposing views outside the table are not accommodated.
- Having a balanced table is important.
- The table was weighted to the forest industry.
- Public outside the table are not accommodated.
- Volunteers should be paid.
- Meeting dates (e.g. weekends) should allow opportunity for the average citizen to participate in the planning process.
- Meeting times (e.g. after work hours) should allow the average citizen to participate.

Document Reviews

Social Criteria Results

Three of four LRMP processes reached consensus agreement regarding a proposed plan. However, the Robson Valley plan contains three options for the boundaries that define the RMZs. There is an environmental sector option, a resource industry option, and a government option. The LRMP document indicates that there was division among table members regarding the size of proposed protected areas.

Environmental Criteria Results

Results for the LRMP plans indicate a lack of consideration for linkages between RMZs and between planning areas (Table 24). There was minimal direction regarding monitoring and minimal consideration of disturbance ecology. Where specific direction was included, it pertained mostly to key species such as grizzly bear, moose, elk and caribou.

Table 24. Assessment of the degree (none, minimal, general, or specific) to which environmental criteria were considered in LRMP documents for Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs)

LRMP	Biodiversity	Environmental Impacts	Corridors/ Zones	Monitoring	Disturbance
Plan Guidelines					
PGo	Specific	General	Specific	Minimal	General
RVs	Specific	General	Specific	Minimal	General
VAo	Specific	General	Specific	Minimal	General
DCs	General	General	Specific	Minimal	General
Within RMZ					
PGo	Specific	Specific	Specific	None	None
RVs	Specific	Specific	Specific	None	None
VAo	Specific	Specific	Specific	None	Specific
DCs	Specific	Specific	Specific	None	General
Between RMZs					
PGo	None	None	None	None	None
RVs	None	None	None	None	None
VAo	None	None	Specific	None	None
DCs	None	None	None	None	None
Between Plan Areas					
PGo	None	None	None	None	None
RVs	None	None	None	None	None
VAo	None	None	None	None	None
DCs	None	None	None	None	None

Corroboration of Data Sets

Social Criteria

A comparison of the combined social criteria data from the mail survey and interviews shows a similar pattern (Figure 6). The four point scale used in both the mail survey and interviews allowed a correlation test to be performed on the combined results of the data sets. Results of the correlation test (Table 25) produced a correlation coefficient of 9.35 at a significance level of 1% for a 1-tailed test.

Figure 6. Kruskal-Wallis mean ranks of combined social criteria based on mail survey and interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

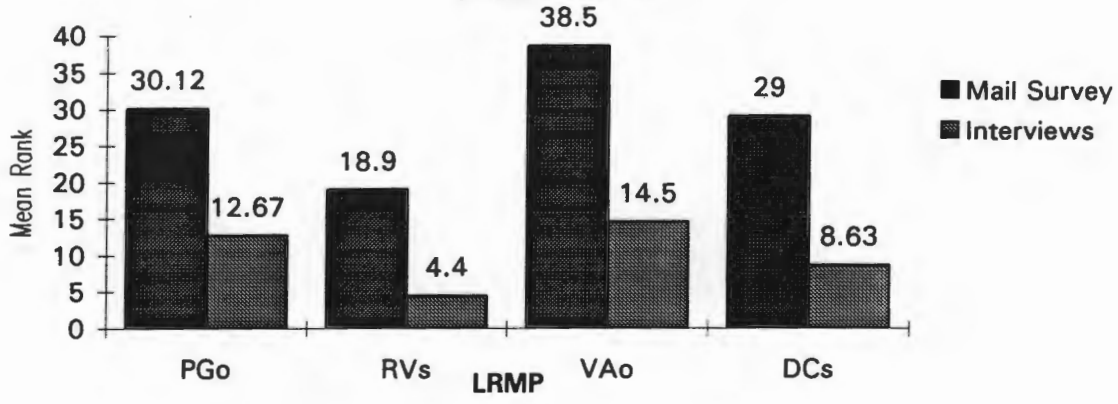


Table 25. Pearson correlation of combined social criteria from mail survey and interviews

	N	Mean Rank	Std. Deviation	Correlation*
Mail Survey	16	2.8047	0.6268	0.935
Interviews	16	3.0440	0.6678	0.935

* Correlation is significant at the 0.01 level (1-tailed)

A comparison of the Kruskal-Wallis test results from the mail survey and interviews (Table 26) corroborates the Pearson correlation results as it shows that the two data sets produced similar differences for the combined social criteria. This comparison shows that results for the Vanderhoof LRMP are significantly better than the results for the Dawson Creek and Robson Valley LRMPs (sectoral cases). The results also show that Prince George LRMP results for the combined criteria are significantly better than the results from the Robson Valley LRMP.

Comparison of differences found with Kruskal-Wallis test, between data sets, indicates that interview data had fewer criteria with significant differences (Table 26). Significant differences were obtained with three criteria (inclusion, communication, and

understanding) from the mail survey and two criteria from the interview (empowerment and understanding). The trends for both data sets show that the Vandherhoof LRMP (open case) received significantly better results than the two sectoral cases (Dawson Creek and Robson Valley) for two criteria. The results also show consistently better results for the two open cases (Prince George and Vanderhoof) than the Robson Valley LRMP (sectoral case). One exception to the trends was that the significant differences found in the mail survey between the Dawson Creek and the Robson Valley LRMPs were not repeated in the interviews.

Table 26. Summary of case comparison in which significant differences (SD) were found for social criteria as determined from mail surveys and interviews of LRMP participants for Prince George (PGo), Robson Valley, Vanderhoof (VAo) and Dawson Creek (DCs)

	Mail Survey		Interviews	
Criteria	LRMP	SD	LRMP	SD
Inclusion	PGo	RVs	PGo	
	RVs		RVs	
	VAo	RVs	VAo	
	DCs	RVs	DCs	
Empowerment	PGo		PGo	RVs
	RVs		RVs	
	VAo		VAo	RVs, DCs
	DCs		DCs	
Communication	PGo	RVs	PGo	RVs
	RVs		RVs	
	VAo	PGo, RVs, DCs	VAo	RVs, DCs
	DCs	RVs	DCs	
Understanding	PGo	RVs	PGo	
	RVs		RVs	
	VAo	PGo, RVs, DCs	VAo	
	DCs	RVs	DCs	
Combined Criteria	PGo	RVs	PGo	RVs
	RVs		RVs	
	VAo	RVs, DCs	VAo	RVs, DCs
	DCs	RVs	DCs	

Environmental Criteria

Kruskal-Wallis mean ranks of the data sets for the environmental criteria (Figure 7) do not reveal differences between the data sets. However, the Kruskal-Wallis mean ranks of the environmental training criteria indicate that there are differences between the mail survey and interview data sets (Figure 8).

Figure 7. Kruskal-Wallis mean ranks of combined environmental criteria from mail survey and interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs

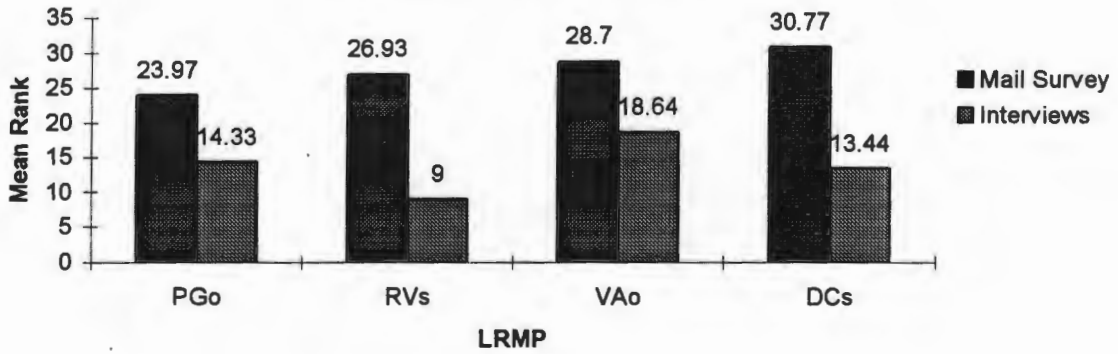
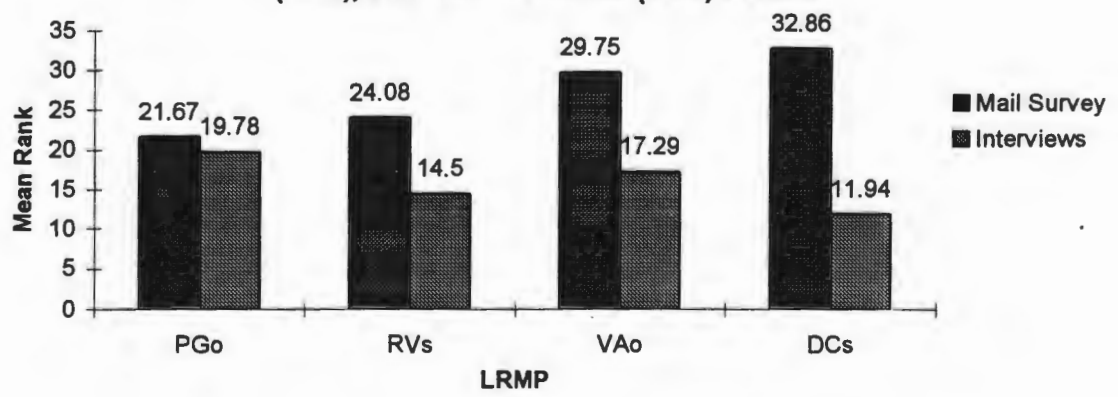


Figure 8. Kruskal-Wallis mean ranks of combined environmental training criteria from mail survey and interviews of participants of the Prince George (PGo), Robson Valley (RVs), Vanderhoof (VAo), and Dawson Creek (DCs) LRMPs



Comparison of the combined environment training criteria show differences in the results for Prince George and Dawson Creek LRMPs for the environmental training data. The comparison indicates higher results for interview data than the mail survey for the Prince George LRMP and lower results from interview data than the mail survey for the Dawson Creek LRMP.

There were no significant differences for the environmental criteria from either the mail surveys or interviews. The lack of significant differences was repeated for the environmental training criteria with the exception of the "disturbance" criterion from the interview data. Results for the "disturbance" training criterion indicate that results for the open cases (Prince George and Vanderhoof) were significantly better than results for the sectoral cases (Dawson Creek and Robson Valley).

DISCUSSION

Heifetz and Sinder (1990) indicated that most issues in society are too complex to be solved in isolation from the public. Politicians in British Columbia have responded to public demand for a greater voice in land use planning by creating the CORE and LRMP processes. It is important that politicians and policy makers consider the views and experiences of participants in planning future iterations of the LRMP process. The following discussion focuses on major issues obtained from the experiences of table members as reported in interviews and the mail survey.

Process Facilitator

The role of the chair in facilitating the process may be one factor that contributed to the relative success of the two open cases. The reasons for these

differences are unclear. However, further discussion of the chair is important because all participants placed importance on the role of a process facilitator.

Patience of the facilitator and ability to keep the process moving forward according to agreed upon rules is an important factor in the success of public participation programs (Kofinas and Griggs 1996, Pinkerton 1996). In the words of one participant, "The chairs would keep the discussion on track when it was in danger of being dominated either by a few strong personalities or by a few strong interest groups, and I think the training of the chairs is probably far more important than what we got as a table member. They both had their place, but chairing a meeting like this is an awesome task. " Another aspect is the ability of the chair to help all participants understand the discussion, as noted in the following comment: "...I go back always to the chair to ensure that everyone understands what a person says."

Perhaps of more importance is the chair's perceived neutrality (Bingham 1986, Van de Klundert and Glasbergen 1995) in allowing fair exchange of ideas as noted in the following statement: "...so I think the chair did an excellent job in allocating time for those interests to be heard equally amongst all the members, not just one sector, or one set of values." The negative responses may have more to do with the questionable neutrality of the chair rather than the chair's ability, as indicated in the following statement: "They insisted on having a government employee as a facilitator...but it's not his skill level to do this...and it shouldn't be the role of the facilitator to be the employee of the IAMC (Inter Agency Management Committee). He should be working for the table, for the public. I think that was a major problem."

The facilitator's prime responsibility is to assist the group in reaching consensus; however, this may be impossible if the participants sense an unequal distribution of power in the negotiating process (Van de Klundert and Glasbergen 1995). Each of the government agencies has specific roles and are stake holders in the process. Therefore, it is understandable that participants could suspect the facilitator of

representing a government agenda if the process is not seen as balanced (Van de Klundert and Glasbergen 1995). Government may want to consider the use of a neutral facilitator who is selected by the table members.

Political Direction

The British Columbia government supported the concept of local participation by establishing the LRMP process. Such political support through legislation and policy is necessary to encourage and give creditability to the shared decision making process (Ashton et al. 1994, Thrupp et al. 1994, Torell 1993) and to protect democratic rights (Beetham 1992). Beetham (1992:41) noted that "Democratic rights, in other words, are those individual rights which are necessary to secure popular control over the process of collective decision-making on an ongoing basis, and which need protection even when (or especially when) their exercise involves opinions or actions that are unpopular, whether with the government or society at large."

The move to include the public in land-use decision making is important; however, there are two important questions for politicians and the public to consider: 1) what are the limits to public participation; and, 2) what role should the government have in the public planning process? In this study, responses of table members indicated that these two questions may be key elements of success.

Concern by LRMP participants about political direction may result from a distrust of government by the public (Knopp and Caldbeck 1990, Lawrence et al. 1997, Shindler et al. 1996). This distrust was expressed in the following participant statement: "You're used when you go to participate at one of these things, there's no doubt about it. You're being used by the government and they use it in their media hype and to say that it was the people who drew up the plan and it was put together by the people, so you're used in that way. It never talks about the constraints you were

under at the time you did it. They make it sound like the plan is exactly what you wished when it's far from it."

There was also a concern about changing direction or changing rules. One example of changing rules expressed by several table members was the percentage of land base allowed for protected areas; for example: "Again, our percentages dropped on an almost monthly [basis]...every time I went to a meeting we went down, down, down. I think it could have been a great process had we all been dealt an even number of cards." The success of a given process may be related to the relative sense of fairness perceived by each LRMP group (Lawrence et al. 1997). Therefore, "...failure of procedures to comport with societal norms of fairness will result in disaffection" (Lawrence et al. 1997:587). Differing perceptions of fairness could explain the variable responses of table members with respect to political direction and the changing of rules.

The rules and limitations of a group planning process must be established up front in a public planning process (Shindler and Neburka 1997). Frustration over changing rules, combined with a lack of guidance at the beginning may have contributed to the dissatisfaction noted in the study. The participants' comments indicate that clear direction by government is essential at the outset of the process. People need to know the rules of the process so they can decide if participating will be worth their time and effort.

Role of government and participants

Several people questioned the roles of government and participants in the LRMP process. Government does have a role in providing technical expertise, representing citizens of British Columbia who are not at the table, and establishing the legislative limits to the processes (Wondolleck 1988). One participant commented that "our table, a few times, got into things that were non-negotiable that we shouldn't have been

putting our time towards...a clearer understanding [was needed] at the outset for all the participants of what they're there for." Government could improve the LRMP process by clearly identifying up-front what legislative or policy areas are not negotiable.

The roles of participants are defined in part by the ground rules established by government as elements of the process, and by the rules defined by the terms of reference.

Process rules

The process rules (or "terms of reference") are established at the beginning of the process based on the direction given by government. Participants need to know that the terms of reference, once negotiated, will not be changed. A true partnership requires that "after the groundrules have been established through some form of give-and-take, they are not subject to unilateral change" (Arnstein 1969). Changing the protected area percentages available to a table may be considered a change in policy; however, table participants could with justification see these policy shifts as changes in the ground rules. One participant, when asked a question about their overall assessment of the LRMP process stated that "...the thing that's bothersome, that's frustrating, is that rules changed during the process. The IAMC and other people weren't always consistent in the process so you didn't know from one time if you thought you had the authority to do something and then someone else [would] say 'no you don't'. 'We're changing it.' Political pressure would always end up showing up somewhere."

Public participation in sub-regional land use planning was a big policy shift for government in 1992 and it is understandable that there may exist uncertainties about what ground rules were necessary. However, it is important that future iterations of the process establish firm goal posts up front in the planning process. Government

should also be cognizant that seemingly arbitrary changes in those goal posts could have a disruptive influence on the planning process.

Ownership of the Process by LRMP Participants.

An important starting point for effective public participation in shared decision making is a sense of ownership of the process by the participants (Cortner and Shannon 1993). Ownership can only occur if participants are able to see a clear and open method of decision making through a process that is just and will capture and respect their interests (Blouin 1998, Knopp and Caldbeck 1990, Lawrence et al. 1997, Sirmon et al. 1993).

Public involvement processes are complex, with many inter-linked components. It is understandable that disruptive influences such as a change in facilitators, unwillingness of participants to accept responsibility, and changing rules could lead to less than desirable results.

Length of Process

Should governments impose time limits on a process? Table members expressed divergent concerns about either spending too much time or not having enough time to fully discuss issues.

Government should consider the amount of staff time available to assist these processes as well as the concerns of table members regarding the length of process. As one participant commented, "...it became valueless in some ways in that it was given no firm time lines to operate within."

Time limits are important; however, government should also consider the complexity of the issues and the limited resources available to the planning group. Complex issues require ample time and if resources are not in place at the outset, then additional time may be necessary to obtain the information. A table member aptly

commented that "...if a government wants an answer quickly, they're not going to get it through an LRMP process." Government, in collaboration with each LRMP at the beginning of each process, should set realistic timelines that allow for meaningful dialogue and define time frames for each step of the process (Canadian Standards Association (CSA) 1996).

Training in Interest Based Negotiation

Interest based training was provided to the Vanderhoof LRMP and Robson Valley LRMPs; however, some of the Robson Valley table members decided not to attend. There was no such training provided to the Dawson Creek or the Prince George planning groups. Effectiveness of such training was not assessed; however, the prospects to success are best if everyone receives the same training and if what is learned is re-enforced throughout the planning process.

One table member from Robson Valley noted that "Oh, I think that the training that we got, that was that one day that I had talked about, was excellent. It's just very unfortunate that so few people chose to attend it. I think a lot of people looked at it as not a critical part of the negotiations and so they chose not to attend...". The problem with not having everyone involved, as noted by another Robson Valley table member was that it "...can be disruptive if one or two (are) not following interest based negotiation...(you) need everyone to understand." These statements indicated that the concept of interest based negotiation must be embraced by all table members in order to be effective.

Interest based training must be more than a one or two day session; it must carry through the negotiation session by participants and the chair. One Vanderhoof participant noted that "...it wasn't just a one day thing. Jeanine and Dave (co-chairs), and different people around the table, would refer to it over the next one and a half years or so." Training should be provided early in the process. A Vanderhoof table

member observed that "...they had that negotiation skills training session, I think, more or less at the right time because it was before we went in discussing the resource management results."

The number of table members who received negotiation training, timing of the training, and reinforcement of the interest based negotiation principles throughout the planning process may all be factors in the relative success of the Vanderhoof LRMP in achieving social process objectives. Therefore, government should consider interest based training at the outset of future public participation processes, including mandatory participation for all table members (including those who join the process later).

Process

Process effectiveness may also be influenced by the local Inter-Agency Planning Team (IPT), the regional Inter-Agency Management Committee (IAMC), and the Land Use Coordination Office (LUCO) in Victoria. All these bodies have a role to provide support and direction for the LRMP process. Comments offered by interviewed participants suggested that coordination among agencies may have detracted from the process because agency disagreements can be disruptive. It is important for provincial government agencies to co-operate in presenting government policy and over-seeing the process.

Interview participants also identified the timely reporting and distribution of minutes as an important need. Each IPT should recognize that timely and accurate minutes are important for building trust with table members. This documentation keeps members appraised of changes and developments made at each meeting. They also serve as a reporting mechanism for those table members who report to constituents.

The minutes of meetings can also be used to inform interested members of the general public.

Public Representation in the Planning Process

An important aspect of public participation is deciding who should participate in the process. Some would say that the sectoral model is the best way to ensure that public interests are represented (Blahna and Yonts-Shepard 1989, Fairfax 1975). Others would say that the only way to ensure that the broadest range of interests are included would be to open the process for anyone to participate (Blahna and Yonts-Shepard 1989, Sirmon et al. 1993, Thomas 1995). Regardless of the process, not all interests will be represented at the LRMP table. A participant noted that "...the LRMP process has been successful in bringing some of the members, not all, but some of the members of the concerned public together in a forum to air some of their issues." Therefore, another role of government is to represent the public that are not present at the LRMP table (Wondolleck 1988). Government, both local and provincial, should have a presence in the process to assist the table by representing community interests that would otherwise not have a voice. However, government could improve local representation through procedural changes.

A procedural barrier was noted by a participant who said "I've had numerous people comment to me 'how could the LRMP do this or that or whatever?' It doesn't make sense and you say, 'well, why don't you go?' 'Because it was always meeting on Fridays and I can't keep taking Fridays off'...And so there was a lot of frustration expressed by various individuals that would have liked to have gone but couldn't because of the time of the meetings...The biggest thing seems to be that various interest groups always can find a way to have somebody there but the sort of average person can't always be there and a lot of the average people wanted to be involved." Holding LRMP processes during week days may be suitable to government, industry and other

paid interest groups; however, it can effectively eliminate the average person from participation in the LRMP process.

LRMP planning areas cover large areas of land and encompass more than one community. Therefore, another barrier to public representation is the location of meetings and the necessity for travel. One table member stated "...it becomes inequitable for individuals sitting there, traveling 60 miles, coming in, sitting for a couple of hours in the LRMP, going home, going to my job, where other individuals...they could share that task with 3 or 4 people within their company, attended different times. So there's an inequitable time span by individuals there." One solution noted by this participant was "paid representation or something like that..." Paid representation or perhaps shifting locations of the meeting would help ameliorate some of the differences between paid representatives and volunteers.

Public representation may also be inadequate in a process because certain segments of society lack the resources to participate (Arnstein 1969). For example, this study found a significant difference in how volunteer participants rated the process (lower) than did participants who were compensated by their employees. The literature indicates various levels of support for the notion of providing remuneration for volunteers to aid in decision making (Arnstein 1969, Shindler and Neburka 1997, Thomas et. al. 1995). The level of compensation that should be provided to volunteers is up to government; however, funding is one method that could be considered for improving representation of the general public and providing a level playing field.

That no significant differences were found for job type (forestry versus all other sectors) may reflect that even LRMP participants who are not directly employed by the forest industry may have indirect linkages to the forest sector. Gender participation did not yield significantly different results; however, it must be noted that female representation in the LRMP process was minimal. It is possible that a larger representation of female participants could yield different study results.

Model Comparisons

Social Criteria and Processes

Analysis of the mail survey produced significant differences, favouring the open model, in 8 of the 16 possible comparisons involving social process criteria. The interview portion of the study produced significant differences (favouring the open model) in 6 comparisons involving social process criteria. These differences may be explained in part by features of the models.

Participants in sectoral models are selected according the specific interest they represent. These individuals are supposed to speak up for the particular sector, and may not be as open to the interests of others in the community. In the open model, anyone from the community may sit as a table member. These table members may be from interests groups or they may be interested public members who are free to bring any issue to the table. Results of both the mail survey and interviews indicate that the open cases achieved significantly better results than the sectoral cases for the communication criterion. The mail survey also indicated significant differences in favour of the open model for the understanding criterion. Results for these criteria may reflect a more open and flexible approach to the LRMP process by some members of the open tables. Sectoral participants may not feel as free to entertain other interests. As well, interview respondents' overall assessment of the LRMP process produced a higher percentage of positive responses from the open model over the sectoral model. Unencumbered communication and a high level of understanding about the value of others are important aspects of local decision making (Sirmon et al 1993, Thomas 1995).

There was also evidence from both sectoral cases that the processes were divided and in the Robson Valley case, participants made comments that the process had polarized the table members. The Robson Valley LRMP plan (1996) containing

three options for protected areas is further evidence of a lack of consensus. It may be that participants in the sectoral model, by serving as advocates or defenders of a particular position, are less able to "give and take" during negotiations. The result would be a break down in communication and failure to achieve consensus.

The argument that model type caused the differences in the social criteria is very compelling; however, it would also be premature to make that conclusion for two reasons. First, not all the comparisons produced significant results in favour of the open model. Second, there are other factors that may have contributed to the differences.

As discussed above, political direction, changing rules, and issues of fairness may have influenced some LRMPs more than others. The frustration over changing rules was captured by one participant from Robson Valley who noted that "Like in the beginning of the process they told us whatever the group came up with for the amount of protected areas, special management, etc. would be determined at the table and as time went on the government came down and told us what percentage of protected and special management areas were going to be allowed...". One participant from Dawson Creek indicated that government "sand bagged" the process with the protected area percentages. The changing rules may have contributed to a rift between interest groups within the LRMP process.

Environmental Criteria

No significant differences were found for the environmental criteria and the only differences among the environmental training criteria occurred for the disturbance criterion as based on interview data. Participants in the open cases gave a higher rating to training provided on disturbance ecology. Perhaps better communication with the open model cases, indicated by results of the social criteria analysis, aided the table member's understanding of disturbance ecology.

Data from the environmental criteria were inconclusive compared to the results for social processes. The results do not support rejection of the null hypothesis that model type does not make a difference with respect to the environmental criteria.

As was the case for social criteria, political direction and changing rules may have contributed to the inconclusiveness in how participants perceived the responsiveness of the process to environmental concerns. LRMP participants were particularly concerned about the government Biodiversity Guidebook (Province of British Columbia 1995), protected areas, and special management zones. The Biodiversity Guidebook contains rules regarding how much area, by biogeoclimatic classification, can be managed as high, medium, and low biodiversity (Province of British Columbia 1995). Government also established the percentage of land base in each LRMP that could be set aside from industrial resource development as protected areas. These policy issues had the effect of restricting discussion about environmental issues. The low ratings of environmental criteria may reflect dissatisfaction with these constraints regardless of the model (open or sectoral) by which members were selected.

Monitoring was the lowest rated environmental criterion in part because government policy does not provide for development of criteria to measure success or failure of LRMP strategies. One participant noted that "We were going to drive down that road pretty detailed there once upon a time until we started getting vibes from LUCO that they weren't going to provide indicators...so we didn't really pursue that too deeply." Another participant noted that "I don't think we did an awful lot of that because it wasn't in our terms of reference..."

The low ratings for environmental criteria may relate more to quality than quantity of information. One participant indicated that "Oh, I think quite well...we were given handouts and maps...but I would probably question the quality of that information...we need to find some information about uses, you know, hunting, angling, parks, winter parks, attendance, camping data, that kind of stuff...information

that was given to us was general...there wasn't information going back...." Another participant noted that "I guess the big Achilles heel in Prince George...is that we don't have base line data to build a monitoring." The lack of baseline information, as this participant indicates, may have not been sufficient for making informed decisions and may have contributed to the inconclusiveness of the environmental results.

No differences were found regarding gender, job type (forestry versus all others), and paid versus volunteer status with respect to how people viewed treatment of environmental concerns in the context of their LRMP experiences.

Another reason for the inconclusive and low environmental scores could be the "fuzziness" in people's understanding about ecosystems and concepts such as sustainable development and ecosystem management. The words "sustainable" and "development" when placed together are considered a contradiction by some people (Jickling 1992), and confusing to many more. How can you have development and sustain the environment at the same time? Likewise, concepts such as biodiversity, ecological integrity, landscape linkages, and disturbance ecology are probably unclear to many LRMP participants.

A person's reactions and feelings about the environment are complex and changeable because of the abstract and dynamic nature of ecosystems (Tuan 1973). Further complicating participants' understanding is the fact that our knowledge about ecological processes, including biodiversity effects, is incomplete. Understandably, table members could have misgivings about the effectiveness of the LRMP process with respect to ecological goals. One participant alluded to confusion surrounding biodiversity by stating "There are not very many people out there with the same definition of biodiversity, at least that's been my experience. " Uncertainty about concepts, plus a lack of quality information about the potential environmental impacts of resource uses, may have led to another participant's statement that "I don't think we

talked about that very much at all. There's not an impact assessment framework at all applied to this."

Factors Related to Sampling

Mailing lists for LRMP table members were obtained from three of four forest districts. One forest district wanted to maintain security of the mailing list and assisted the research by mailing the survey to LRMP table members. The mailing lists are complete to the extent that lists are maintained by each forest district. There is a small possibility that a few people who left early in the process may not have been included in the lists. Three surveys could not be mailed to Dawson Creek participants for whom a current address was not available, and two surveys were returned by the post office because the individuals had moved. There is a possibility of error from these sources.

The response rate ranged from 40% to 47% with the average response rate of 42%. The largest possible source of error is from non-respondents and response rates less than 50% are poor (Mangione 1995). Therefore, it is possible that the non-respondents could have made a difference in the results.

Other sources of bias in a mail survey result from the tendency of people to pick the mid point in a survey, and difficulties of trying to remember what has happened over a period of time (Mangione 1995). The LRMP processes took 2.5 - 6 years to complete. Therefore, it is understandable that people may forget some detail. The tendency to pick the central point was mitigated somewhat by using a four point Likert scale for the social criteria. Measurement error is another factor that may have affected the survey, particularly if the questions were not clear to respondents (Mangione 1995).

Another source of error could reside in the interpretation of what aspect of a variable is being measured (DeVellis 1991). The researcher either selects a range of measurement that is too broad or does not develop the appropriate questions to measure the desired aspect of the criteria (DeVellis 1991).

Study Design and Future Studies

This study did show some significant differences between the open and sectoral models; however, factors in study design, study preparation and conduct may have affected the research results. DeVellis (1991) indicated that in developing a scale it is important to measure the appropriate aspect of the variable. Failure to be specific enough in the case of at least one social criterion may have prevented detection of possible differences between the models. The communication and negotiation component of the empowerment criterion, for example, may have been too general in its presentation. Three aspects of this sub-variable could be presented to participants of the mail survey and interviews. The first step would be to find out if formal training was provided. The next step would be to find out if the process chair helped to reinforce the training throughout the planning process. The final step, which may possibly be more pertinent to the study, would be to find out how well the participants followed interest based negotiation principles.

Measurement of environmental criteria may have been hampered because the strategic aspect of the LRMPs was not adequately stressed during the study. The LRMP processes are supposed to provide strategic direction for lower level planning, and participants are supposed to somehow elevate their local concerns (including environmental) to a strategic level. Evaluation of environmental criteria would be strengthened by clarification of how well people are able to elevate their local concerns regarding the criteria to a more strategic level.

Changes in the conduct of the study may yield improved results. More rigorous testing of the survey questions with a broader spectrum of people may have helped clarify the survey for some of the participants. An extra mailing may have improved the response rates.

Other areas of public participation in land use planning could be examined; for example, testing for the creation of networks within the community. It would be

interesting to test whether model type makes a difference in how knowledgeable the community is about the LRMP plans and planning process.

Objectives of Government

Social Objectives of Government

Achievement of consensus in three of four LRMPs is an indication that government succeeded in capturing the interests of the public represented at the table. The relative success of the processes in achieving the social objectives of the process ranged from 62% (Robson Valley) to 77% (Vanderhoof); therefore, government can claim moderate to good results for the LRMP processes in capturing the social interest of table members. However, the interests captured by the LRMP process must be defined within the rules that were established by government. The LRMP plans likely do not reflect all of the interests in an LRMP area because of barriers to table membership such as meeting dates (week days instead of week ends), meeting times (morning or afternoon instead of evening), and facilities for families (child care).

Environmental Objectives of Government

According to government LRMP policy "land use and resource management recommendations must be within the environmental capacity of the land to sustain use " (IRPC 1993). Did the LRMP processes result in strategies for land resource use? This question is much more difficult to answer based on responses and perceptions of LRMP participants.

Political direction played a significant role in the development of LRMP environmental recommendations. One such direction was the introduction, part way through the planning processes, of the Biodiversity Guidebook in 1995 (Province of British Columbia 1995). The guidebook established policies regarding clearcut size, stand structure (seral stage distribution), forest ecosystem networks, and wildlife tree

patch sizes (Province of British Columbia 1995). The guidelines are a mix of government sanctioned values and scientific knowledge. They are not necessarily the values of LRMP participants as evidenced by the negative reactions from the Robson Valley LRMP and the overall ambiguous responses to the environmental criteria from all LRMPs. These results may indicate that table members have a jaundiced view concerning the relative success of the LRMP process in meeting the objectives of government for conserving biodiversity and staying within the capacity of the land to sustain resource uses.

The lack of baseline information noted by table members hampered the discussion about impacts of resource uses; however, the LRMP table members did their best with the information on hand as required by government policy (IRPC 1993). Participants made recommendations for the creation of protected areas, developed strategies for key wildlife species, and made compromises in the creation of special management zones. These recommendations were made within government constraints such as the maximum percentage of area that could be set aside for protection. The constraints may have clouded participant views of the environmental legitimacy of the LRMP process.

Government, as noted earlier, also directed the LRMPs not to develop monitoring criteria. CORE (1992:26) noted that "The key to success in shared decision-making lies in structuring the process so that it involves the participants in the design and development of the process itself, as well as in the negotiation of substantive issues. The parties must be involved from the initial assessment of whether or not it is appropriate to use a shared decision- making approach, through to the ultimate implementation of the agreement and monitoring of the outcome." Lack of monitoring may have triggered skepticism in participants with respect to the realization of environmental goals.

CONCLUSIONS

Results of this study yielded mixed results with respect to the null hypothesis Differences found for some individual and for the combined social criteria indicate that the open model may be more effective in achieving the social objectives of the LRMP process. Lack of differences for environmental criteria do not allow rejection of the null hypothesis. Several factors, including constraints imposed by government, resulted in similar, pessimistic views from all four cases about the LRMPs ability to satisfy environmental concerns.

Lack of established rules at the beginning of the process plus changing government policy were significant factors for some participants because it reinforced a distrust of government. The principles of shared decision making and partnership were compromised by these sudden rule changes. Constraints imposed on environmental options dampened participants' confidence in the LRMPs' ability to achieve environmental goals.

RECOMMENDATIONS

Introduction of the LRMP process in 1992 was a big step forward as in the inclusion of the public as partners in sub-regional land use planning. When asked for their overall impression of the LRMP process, the majority indicated that inclusion of the public in land use planning was a good concept. In the words of one participant, "as a basic approach I would say it's a good start..." The following recommendations are based on the findings of this study, they are offered to assist communities, managers, and policy makers to strengthen shared decision making in land use planning, including future iterations of the current LRMP process:

- The open model of public participation, in whole or part, should be considered for future LRMP processes in order to give greater public access to resource decision making and to provide a format for freer exchange of ideas.
- Process rules should be established up-front in the planning process and must not be arbitrarily changed after the process has begun. This will foster greater trust between table members and the government.
- The roles of table members, including government, must be made clear at the outset of the planning process.
- Government should establish firm but realistic time frames for the completion of the plan, including consideration of the complexities involved in each planning area.
- Government agencies should ensure that baseline information is provided in a timely fashion so that table members can make informed decisions.
- Negotiation skills training should be required for all LRMP participants including people entering the process after it has started.
- Government should consider the use of neutral facilitators selected by the LRMP table in order to improve the level of trust among the public members.
- Meeting notes should be prepared in a timely fashion with changes highlighted from previous meetings.
- Meeting dates and times should be scheduled so that they encourage the broadest range of public involvement (e.g. holding meetings on weekends and after regular working hours).
- Government should consider providing services that would encourage more participation by women, i.e., child care.
- Government should consider increasing the funding available to volunteer participants to encourage a broader representation of public interests.
- Greater representation from the communities can also be encouraged by meeting in different locations within the planning area.

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GLOSSARY

Annual allowable cut (AAC): an annual rate of timber harvest established for a geographic area or a timber tenure.

Agreement Scale: see Likert scale.

Biodiversity: "The variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting" (Noss and Cooperrider 1994:389).

Biodiversity Emphasis Options (BEO): describes a method, contained in the Forest Practices Code of British Columbia Biodiversity Guidebook, for rating landscape units as requiring high, intermediate, or low priority for biodiversity conservation (Province of British Columbia (1995).

Commission on Resources and Economy (CORE): established by legislation in 1992 to regulate land use planning on Crown land in the province of British Columbia.

Corridors: habitat strips and linkages intended to allow the movement of flora and fauna across the landscape.

CORE processes: regional land use planning processes established for specific regions of British Columbia (Vancouver Island, Cariboo-Chilcotin, and Kootenay).

Disturbance: a large change in the landscape caused by natural forces or human activities (e.g. wind, fire, insects, flooding).

Ecosystem: "a dynamic complex of plant, animal, fungal, and microorganism communities and their associated nonliving environment interacting as an ecological unit" (Noss and Cooperrider 1994:389).

Forest Practices Code Act: legislation enacted by the British Columbia government in 1994 to regulate activities on Crown land.

Inter-Agency Management Committee (IAMC): committee of British Columbia government agencies which provides direction and support for land use planning within a region.

Inter-Agency Planning Team (IPT): a committee of local British Columbia government agencies which provides direction and support for an LRMP.

Kruskal-Wallis test: a non-parametric statistical test that is used to determine if significant differences exist among 3 or more groups of data.

Land and resource management planning (LRMP): a sub-regional land use planning process involving citizens, industry, and government as partners in developing a land use plan.

Land Use Coordination Office (LUCO): a provincial level government body which provides direction and support for land use planning in British Columbia.

Likert scale (or agreement scale): is an instrument for measuring responses to a survey in which participants indicate their level agreement or disagreement with a declarative statement.

Open model: a planning process in which any citizen can participate and is expected to bring his/her individual mix of perspectives and interests to the table.

Protected areas: are areas set aside from development through the planning process for the purpose of protecting components of the landscape from resource development.

Pearson correlation: a statistical test to determine the degree of correlation between two sets of data. Values can range between 0 and 1. Test results that are close to 1 signify a strong correlation between data sets.

Protective zones: see corridors.

Regional land use planning: strategic planning that encompasses large areas involving a number of communities.

Round table: a term usually associated with a group of individuals who are empowered to make recommendations or decisions regarding (government) programs or policies.

Sectoral model: a planning process in which participants are selected on the basis of specific interests that are to be represented.

Sub-regional land use planning: strategic planning conducted in community-based areas that are approximately the size of forest districts.

APPENDIX 1

Mail Survey

September 15, 1997

Dear LRMP Participant:

I am a graduate student at the University of Northern British Columbia and need your help to evaluate the effectiveness of the Land and Resource Management Planning (LRMP) process in achieving social and environmental objectives established for land use planning in British Columbia. Results of this research will be compiled as part of the thesis component of the MSc degree programme at UNBC.

In 1992 British Columbia decided to involve local communities as partners in land and resources planning. Many of the LRMP processes that were initiated in the Prince George region are completing their mission of producing objectives and strategies for approval by government. Local communities and managers involved in this process are now faced with the question of how to make future iterations of public involvement processes more efficient. Therefore, I am seeking your support to learn from your experience as an LRMP member in order to evaluate two basic approaches of public involvement. One approach, where anyone from the community is free to join, is known as the "open" model. Another approach is to invite people to the table based on the interests that they represent. This approach is called the "sectoral" model.

I hope to learn from the unique experiences of four LRMP tables and provide feedback to the local level (LRMP tables), the regional level (inter-agency management committee), the provincial level (land-use coordination office), and the community of scientists and professionals. The study will provide information that may help communities to improve future planning processes.

Does the method through which citizens are engaged make a difference in producing plans that meet the social goals and produce objectives and strategies for maintaining a healthy environment based on current scientific knowledge? Questions of this nature are important for two reasons. Public planning processes that capture the

widest range of interests will most likely have the best chance for public acceptance. Second, approaches that empower participants will be more likely to effect real changes that reflect social and environmental goals of the community.

Please complete the enclosed survey and return it in the stamped envelope by October 10, 1997. Your early response is required so that the second phase of the study can be initiated. The second phase will involve interviews with a representative sample of individuals randomly selected from the completed mail survey. The interviews are a research method that allows verification of the mail survey and provides a different format for those selected to express their experiences.

No names or addresses appear on completed questionnaires in order to preserve confidentiality. The survey is coded in order to accomplish the interview stage and compile data. Information supplied with the enclosed survey and the interview will remain confidential.

Thank you very much for your assistance.

Leslie John Hawkins, BScf, R.P.F.
2274 Glenngarry Road
Prince George, B. C.
V2K 3E8
Phone: home (250) 962-0519 work (250) 565-6216

Enclosure

Instructions and Information

The enclosed survey contains three components and is completed as follows:

1) Please provide the following information regarding gender and occupation and return it with the completed survey. This information will be used to ensure that the interview phase of the data collection will be composed of a similar proportion of individuals by gender and industry of employment. Please place a check mark (√) or (x) in the box that corresponds with your selection for the following:

a) I am: *Female* ☐ *Male* ☐

b) I work in:

Farming/Ranching ☐
Forestry ☐
Guiding/Trapping ☐
Home Making ☐
Manufacturing ☐
Mining/Petroleum ☐
Retail/Wholesale/Service ☐
Tourism ☐
Other ☐ Please Specify _____

c) Please mark one of the following

My participation in the LRMP was part of my job ☐ or
My participation in the LRMP was volunteer ☐

d) How often were you able to attend LRMP meetings? Please mark one of the following

0-10%	☐	51-60%	☐
11-20%	☐	61-70%	☐
21-30%	☐	71-80%	☐
31-40%	☐	81-90%	☐
41-50%	☐	91-100%	☐

Instructions and Information

e) Please indicate what factors limited your ability to attend LRMP meetings.

f) If you stopped participating in the LRMP process, please provide details in the following space:

2) The following section titled Social Issues is completed by placing a check mark (√) or (x) in the box that corresponds with your selection.

3) The sections titled Environmental Issues Training and the Environmental Issues are both completed by shading or marking the level that reflects your evaluation. Please refer to the enclosed example. The word "training" used in the survey titled Environmental Issues Training implies either the formal or informal exchange of information necessary to participate effectively in the planning process

Please return the sections titled ***Instructions and Information, Social Issues, Environmental Issues Training and Environmental Issues*** *in the enclosed stamped envelope by June 30, 1997.*

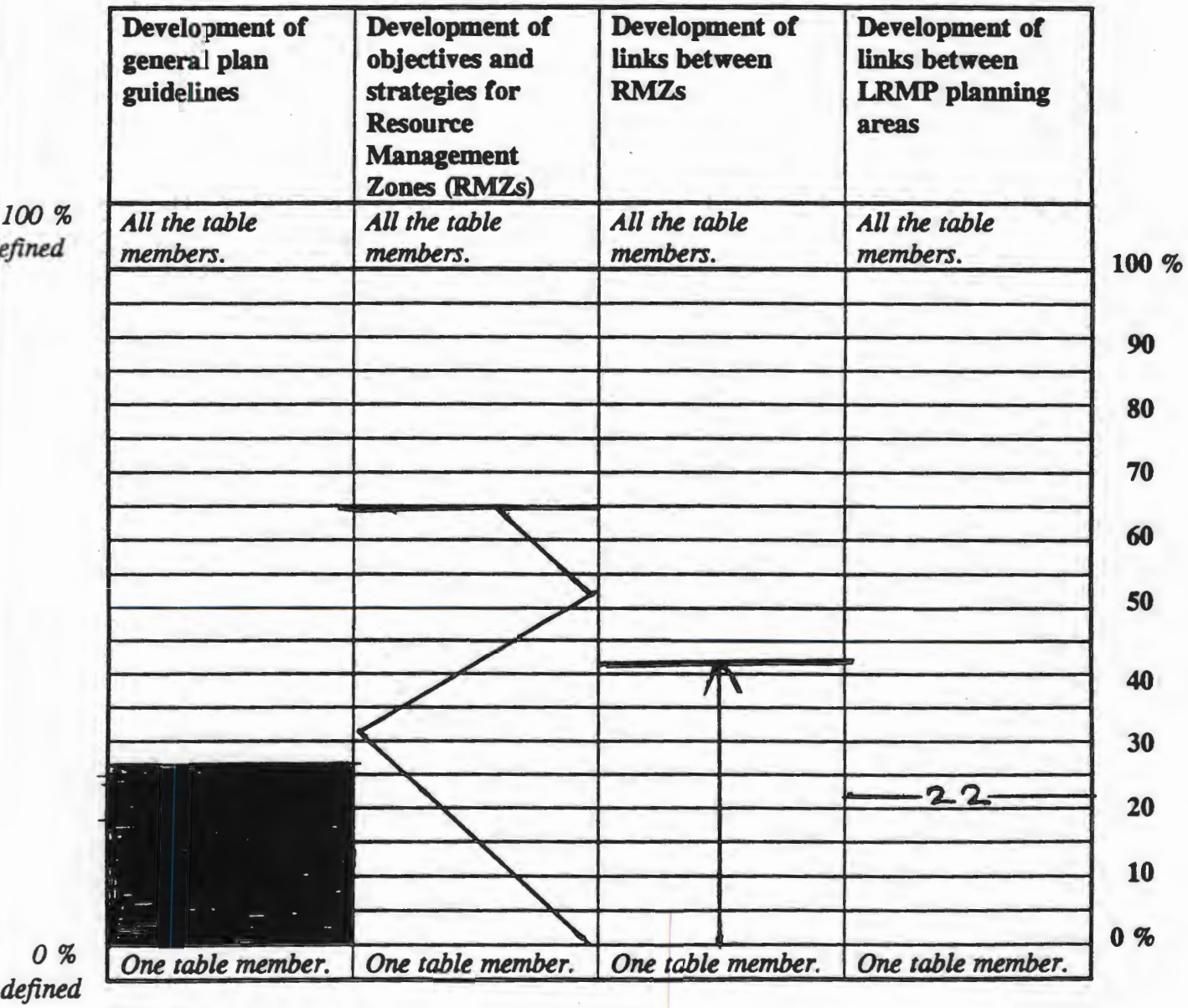
Please, place a check mark (√) *or* (x) *in the box and provide your phone number in the space provided if you wish to participate in the interview stage (second stage) of this study.* ☐ Phone number _____.

Place a check mark (√) *or* (x) *in the box to receive a copy of the research results.* ☐

Example Only

The following has different examplees of how to complete the Environmental Issues and Environmental Issues Training evaluations. This is accomplished by shading or marking the level that corresponds with your evaluation.

1. How many table members were required to develop parts of the plan?



Social Issues

Place a check mark (√) or (x) in the box that corresponds to your selection

	Strongly Disagree	Disagree	Agree	Strongly Agree
The information provided was sufficient for discussion and decisions.				
My concerns were thoughtfully received.				
Negotiation skills training was a crucial part of the LRMP process.				
Table members drafted procedures that made it easy for individuals to express their interests.				
Experts provided clear explanations of technical issues.				
Other table members were unable to understand my concerns.				
Communication skills training was available to all participants.				
The LRMP process has increased the willingness among participants to find solutions to complex problems.				
My concerns provoked meaningful discussion.				
Discussions were easy to follow.				

Social Issues

Place a check mark (√) or (x) in the box that corresponds to your selection

	Strongly Disagree	Disagree	Agree	Strongly Agree
Resource issues were too complex to understand.				
The LRMP process resulted in improved relationships among all participants.				
The process has given me a greater understanding of values held by others.				
The LRMP process allowed the free expression of opinion.				
My views were trivialized.				
Other participants were interested in my opinions.				
Table members were able to find ways of including the values of all members.				
We had enough information to set goals and objectives.				
Technical jargon was always explained so that everyone understood the issues.				
Guest speakers eliminated confusion about technical issues.				

Social Issues

Place a check mark (√) or (x) in the box that corresponds to your selection

	Strongly Disagree	Disagree	Agree	Strongly Agree
Table members always listened to my views.				
LRMP discussions have resulted in a greater sense of community among table members.				
Opposing interests were seldom captured in the objectives and strategies.				
My views were included in setting objectives and strategies.				
Issues were handled effectively because everyone made an effort to understand the values of others.				
Opposing views were included in the formulation of objectives and strategies.				
Training in negotiation skills was provided to all LRMP members.				
Language used in discussing issues was too technical.				
Table members made it difficult to give opinions that were different.				
Resource decisions were made without adequate information.				

Environmental Issues Training*

1. How well informed were you when the LRMP group discussed issues of biodiversity conservation?

Development of general plan guidelines	Development of objectives and strategies for Resource Management Zones (RMZs)	Development of links between RMZs	Development of links between LRMP planning areas
Sufficient training about biodiversity conservation was provided to allow informed discussion in setting goals and objectives .	*Sufficient training about local biodiversity issues was provided to allow informed discussion.*	*Sufficient training about biodiversity issues was provided to allow informed discussion about linkages among RMZs*	*Sufficient training about biodiversity issues was provided to allow informed discussion about links with adjacent planning areas .*
No training was provided to increase my knowledge of biodiversity conservation.	*No training was provided to increase my understanding of local biodiversity issues.*	*No training was provided to increase my knowledge of biodiversity linkages among RMZs.*	*No training was provided to increase my knowledge of biodiversity linkages with adjacent plan areas*

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***Note: the word "*training*" in this section implies either the formal or informal exchange of information necessary to participate effectively in the planning process.**

Environmental Issues Training*

2. How well informed were you about the concepts of ecosystem sustainability during discussions about the impacts of resource uses?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**
Training about environmental impacts of resource uses was provided to allow informed discussion in setting goals and objectives.	*Training about the environmental impacts of resource uses was provided in setting objectives and strategies for RMZs.*	*Training was provided to allow discussions about resource use impacts that extend beyond individual RMZs*	*Training was provided to allow discussions about resource use impacts that extend outside the LRMP area.*
Training was not provided to increase my knowledge of environmental impacts of resource use .	*Training was not provided to increase my understanding of environmental impacts of resource use .*	*Training was not provided to increase my knowledge about resource use impacts that extend beyond individual RMZs.*	*Training was not provided to increase my knowledge of resource use impacts that extend outside the LRMP area.*

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Environmental Issues Training*

3. What was your level of knowledge regarding connective corridors or zones to enhance the viability of protected areas?

Development of general plan guidelines	Development of objectives and strategies for Resource Management Zones (RMZs)	Development of links between RMZs	Development of links between LRMP planning areas
Training about concepts of connective corridors/zones was provided up front in the planning exercise.	*Training about connective corridor/zone issues and opportunities within each RMZ was provided.*	*Training about the importance of linking connective corridors among RMZs for the enhancement of resource values was provided.*	*Training about the importance of linking connective corridors between adjacent planning areas was provided.*
Training was not provided about concepts of connective corridors.	*Training was not provided about connective corridor/zone issues and opportunities within any RMZ.*	*Training was not provided about the necessity of linking connective corridors among RMZs*	*Training was not provided about the necessity of connective corridors between adjacent planning areas.*

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Environmental Issues Training*

4. What level of knowledge was provided for you in developing criteria to monitor impacts of resource uses?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**
Training was provided to allow my participation in the development of environmental monitoring criteria.	*Training provided clear direction for establishing environmental criteria for each RMZ.*	*Training was provided to allow discussion about the linking of environmental monitoring criteria among RMZs.*	*Training was provided to allow discussion about linking monitoring criteria for adjacent planning areas.*
Training was not provided to allow my participation in developing environmental monitoring criteria.	*Training was not provided to allow discussion in establishing environmental criteria for each RMZ.*	*Training was not provided to allow discussion regarding the linking of environmental monitoring criteria among RMZs.*	*Training was not provided to allow discussion about linking monitoring criteria for adjacent planning areas.*

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Environmental Issues Training*

5. What was your level of understanding about patterns and processes of disturbance ecology in setting objectives and strategies?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**	
Training in the concept and relevance of disturbance ecology allowed informed discussions about setting goals and objectives.	*Training was provided about disturbance ecology issues for each RMZ.*	*Training was provided about disturbance ecology linkages among RMZs.*	*Training was provided about disturbance ecology patterns between adjacent planning areas.*	**100 %**
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Training was not provided to explain the concept and processes involved in disturbance ecology.	*Training was not provided to explain disturbance ecology issues for each RMZ.*	*Training was not provided to explain disturbance ecology linkages among RMZs.*	*Training was not provided to explain disturbance ecology patterns between adjacent planning areas.*	**0 %**

Environmental Issues

1. How well did the LRMP group identify goals and objectives to conserve biodiversity?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**	
Biodiversity goals and objectives were clearly established up front in the planning exercise.	*Biodiversity objectives and strategies were developed for each RMZ.*	*Biodiversity objectives were linked among RMZs to ensure progress toward higher level goals of biodiversity.*	*Biodiversity goals and objectives in this plan have clear linkages with those developed for adjacent planning areas.*	**100 %**
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Biodiversity goals and objectives were not established up front in the planning process.	*Biodiversity objectives and strategies were not developed for any RMZ.*	*Biodiversity objectives were not linked between any of the RMZs.*	*Biodiversity objectives and strategies were not linked with adjacent planning areas.*	**0 %**

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Environmental Issues

2. How well did the LRMP group incorporate impacts of resource uses when planning for ecosystem sustainability?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**
Impacts of resource uses on ecosystem sustainability were used in developing goals and objectives.	*Impacts of resource uses on ecosystem sustainability were used in setting objectives and strategies for each RMZ.*	*Impacts of resource uses on ecosystem sustainability among RMZs were used in setting objectives and strategies.*	*Impacts of resource uses on ecosystem sustainability between LRMP areas were used in setting goals & objectives.*
Impacts of resource uses on ecosystem sustainability were not used in developing goals and objectives.	*Impacts of resource uses on ecosystem sustainability were not used in developing objectives and strategies for any RMZ.*	*Impacts of resource uses on ecosystem sustainability among RMZs were not used in developing RMZ objectives and strategies.*	*Impacts of resource uses on ecosystem sustainability between LRMP planning areas were not used in developing goals and objectives.*

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Environmental Issues

3. How well did the LRMP group incorporate connective corridors zones to enhance the viability of protected values?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**
Connective corridors/zones were clearly established up front in the planning exercise.	*Connective corridors/zones were developed for each RMZ.*	*Connective corridors/zones were linked among RMZs to enhance the viability of protected values.*	*Connective corridors/zones were linked with those developed for adjacent LRMP planning areas.*
Connective corridors/zones were not considered up front in the planning exercise.	*Connective corridors/zones were not considered for any RMZ.*	*Connective corridors/zones were not linked among any of the RMZs.*	*Connective corridors/zones were not linked with those developed for adjacent planning areas.*

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Environmental Issues

4. How well did the LRMP group develop criteria to monitor environmental impacts of resource uses?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**	
Criteria to monitor environmental impacts of each resource use were established up front in the planning exercise.	*Criteria to monitor environmental impacts of each resource use were developed for each RMZ.*	*Criteria to monitor environmental impacts of each resource use were linked among RMZs.*	*Criteria to monitor environmental impacts of each resource use were clearly linked with those developed for adjacent LRMPs.*	**100 %**
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Criteria to monitor environmental impacts were not established for any resource use.	*Criteria to monitor environmental impacts for each resource use were not developed for any RMZ.*	*Criteria to monitor environmental impacts of each resource use were not linked among RMZs.*	*Criteria to monitor environmental impacts of each resource use were not linked with those developed for adjacent LRMPs.*	**0 %**

Environmental Issues

5. How well did the LRMP group incorporate concepts of disturbance ecology?

Development of general plan guidelines	**Development of objectives and strategies for Resource Management Zones (RMZs)**	**Development of links between RMZs**	**Development of links between LRMP planning areas**
Disturbance ecology based goals and objectives were established up front in the planning exercise.	*Disturbance ecology based objectives and strategies were developed for each RMZ.*	*Disturbance ecology based objectives were linked among RMZs.*	*Disturbance ecology based goals and objectives were linked with those developed for adjacent LRMPs.*
Disturbance ecology based goals and objectives were not established for this planning exercise.	*Disturbance ecology based objectives and strategies were not developed for each RMZ.*	*Disturbance ecology based objectives were not linked among RMZs .*	*Disturbance ecology based goals and objectives were not linked with those developed for adjacent LRMP areas.*

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APPENDIX 2

Interview Questions

Social Criteria Questions

This first part will concentrate on group interaction and how well the process captured interests of table members.

A) I am going to ask you questions about how well your views were considered during discussion of issues of importance to you.

1. How well did the LRMP process allow you to speak your mind on issues of importance to you?
2. How well did table members listen to your opinions ?
3. Were your interests meaningfully discussed by others at the table?

B) I am going to ask you to rate a number of factors that relate to how well the process empowered you to discuss interests that were meaningful to you.

1. Was communication or negotiation skills training provided to table members. (If Yes) How would you rate this training in preparing you to communicate your interests and negotiate with other table members?
2. How would you rate this process in providing table members with explanations of technical data?
3. Were confusing or technical terms used in identifying problems and finding solutions ?
4. How well did the LRMP process incorporate opposing views in the formulation of objectives and strategies?
5. How would you rate the LRMP process in providing enough information to allow you to participate on an equal footing with other table members?

C) I am going to ask you to rate how well the process improved communication and relationships with all table members

1. How would you rate the process in improving communications between table members?
2. How well did the LRMP process improve trust and respect among table members ?

D) How would you rate the LRMP process in terms of providing a greater understanding among participants about each others interests?

Environmental Criteria Questions and Overall Assessment of LRMP

E) One of the stated objectives of government is the "...preservation of biodiversity. (p18)".

1. How would you describe the _____ LRMP process in providing information about biodiversity conservation that would allow you to participate effectively throughout the planning process?

A definition of biodiversity is "the variety of life forms, the ecological roles they perform and the genetic diversity they contain. (p37)"(appendix 1 A land use strategy).

2. How would you evaluate the _____ LRMP process in providing objectives and strategies for achieving the goal of preserving biodiversity.?

F) In order to have a sustainable future a stated goal for "A sustainable British Columbia requires that the negative effects of human activity on the environment are minimized...(p18). "

1. How would you rate the _____ LRMP process in providing information about the environmental impacts of resource uses on the environment?

F) One of the principles of sustainability stated by the *British Columbia Round Table on the Environment and the Economy* is "to limit human impact on the living world to stay within its carrying capacity."(p18)

2. How well did the _____ LRMP process consider the impacts of resource uses in setting objectives and strategies for achieving a sustainable environment?

G) Literature indicates that connective corridors and zones can enhance the viability of wildlife contained in protected areas by providing dwelling habitat and serve as conduits for the migration of plants and animals (Noss and Cooperrider).

1. How would you describe the _____ LRMP process in providing information about connective corridor and zone opportunities within the planning area?

2. How would you evaluate the _____ LRMP process in establishing connective corridors or zones?

H) Various patterns of disturbance (e.g. windthrow, fire , and flooding) form an important part of ecosystems. The literature indicates that "Many plant and animal species are not only adapted to disturbance , depend on them for survival." (Noss and Copperrider 1994:42).

1. How would you rate the _____ LRMP process in providing information about natural disturbance patterns and processes necessary to allow your participation in setting objectives and strategies?

2. How would you evaluate the _____ LRMP process in establishing goals, objectives and strategies based on disturbance patterns and cycle?.

I) Environmental monitoring criteria are important as adaptive management tools by allowing us to determine if our strategies are working. Monitoring criteria provides us the opportunity to collect information so that plans can be adapted to reflect changing goals of society and to correct strategies that are not accomplishing the desired objective. (Noss and Cooperrider)

1. How would you describe the _____ LRMP process in providing information about environmental monitoring criteria necessary to monitor the impacts of objectives and strategies?

2. How would you rate the _____ LRMP process in establishing monitoring criteria necessary to monitor the impacts of objectives and strategies?

J) What is your overall assessment of the LRMP process as a mechanism for land use planning?

APPENDIX 3

Mean Scores from Mail Survey and Interviews

Table 27. Mean scores for social criteria from mail survey of participants of the Prince George (PG), Robson Valley (RV), Vanderhoof (VA), and Dawson Creek (DC) LRMPs

	LRMP	N	Average
1. Inclusion	PG	19	2.92
	RV	15	2.57
	VA	12	2.96
	DC	14	3.07
	Total	60	
2. Empowerment	PG	18	2.48
	RV	16	2.71
	VA	11	2.85
	DC	13	2.57
	Total	58	
3. Communication	PG	22	2.86
	RV	16	2.17
	VA	13	3.26
	DC	15	2.89
	Total	66	
4. Understanding	PG	21	2.80
	RV	16	2.50
	VA	13	3.10
	DC	16	2.79
	Total	66	
Combined Criteria	PG	17	2.80
	RV	16	2.48
	VA	11	3.06
	DC	13	2.78
	Total	57	

Table 28. Mean scores for environmental and environmental training criteria from mail survey of participants of the Prince George (PG), Robson Valley (RV), Vanderhoof (VA), and Dawson Creek (DC) LRMPs

	Environmental Criteria			Environmental Training Criteria		
	LRMP	N	Mean	LRMP	N	Mean
1. Biodiversity	PG	20	45.21	PG	19	42.08
	RV	15	54.40	RV	14	45.84
	VA	13	56.60	VA	12	51.73
	DC	15	58.92	DC	15	55.78
	Total	63		Total	60	
2. Impacts	PG	18	39.11	PG	18	44.68
	RV	14	44.66	RV	14	43.07
	VA	13	49.81	VA	13	54.10
	DC	15	51.17	DC	14	49.66
	Total	60		Total	59	
3. Corridors/Zones	PG	19	29.45	PG	17	38.28
	RV	15	46.82	RV	14	56.30
	VA	11	41.59	VA	12	47.13
	DC	15	50.85	DC	15	54.42
	Total	60		Total	58	
4. Monitoring	PG	16	24.48	PG	18	19.61
	RV	14	26.64	RV	15	35.95
	VA	12	26.50	VA	12	32.31
	DC	15	41.22	DC	15	44.28
	Total	57		Total	60	
5. Disturbance	PG	18	35.56	PG	18	31.97
	RV	15	37.37	RV	15	33.15
	VA	12	42.77	VA	13	55.33
	DC	15	37.40	DC	15	45.98
	Total	60		Total	61	
Combined Criteria	PG	15	44.66	PG	15	34.11
	RV	14	49.59	RV	12	39.68
	VA	10	53.97	VA	12	47.14
	DC	15	58.38	DC	14	52.06
	Total	54		Total	53	

Table 29. Mean scores for social criteria from interviews of participants of the Prince George (PG), Robson Valley (RV), Vanderhoof (VA), and Dawson Creek (DC) LRMPs

	LRMP	N	Mean
1. Inclusion	PG	8	3.42
	RV	7	2.93
	VA	8	3.65
	DC	8	2.98
	Total	31	
2. Empowerment	PG	4	3.00
	RV	6	2.45
	VA	6	3.32
	DC	7	2.45
	Total	23	
3. Communication	PG	10	3.25
	RV	7	2.32
	VA	6	3.58
	DC	9	2.86
	Total	32	
4. Understanding	PG	9	3.56
	RV	7	3.00
	VA	8	3.75
	DC	9	3.78
	Total	33	
Combined Criteria	PG	3	3.33
	RV	6	2.55
	VA	4	3.57
	DC	6	2.84
	Total	19	

Table 30. Mean scores for environmental and environmental training criteria from interviews of participants of the Prince George (PG), Robson Valley (RV), Vanderhoof (VA), and Dawson Creek (DC) LRMPs

	Environmental Criteria			Environmental Training Criteria		
	LRMP	N	Mean	LRMP	N	Mean
1. Biodiversity	PG	10	2.55	PG	9	2.67
	RV	6	1.83	RV	7	3.14
	VA	7	2.86	VA	8	2.88
	DC	8	2.81	DC	9	2.22
	Total	31		Total	33	
2. Impacts	PG	8	2.38	PG	9	2.44
	RV	7	2.29	RV	7	2.14
	VA	8	2.63	VA	7	2.43
	DC	9	2.44	DC	9	2.33
	Total	32		Total	32	
3. Corridors/Zones	PG	8	3.00	PG	9	3.22
	RV	8	2.43	RV	7	2.79
	VA	8	3.38	VA	8	3.13
	DC	9	2.89	DC	9	3.11
	Total	33		Total	33	
4. Monitoring Criteria	PG	10	1.75	PG	9	1.67
	RV	7	1.43	RV	7	1.57
	VA	8	1.63	VA	8	1.63
	DC	9	2.00	DC	9	1.89
	Total	34		Total	33	
5. Disturbance	PG	8	3.19	PG	9	3.61
	RV	7	2.14	RV	7	2.14
	VA	8	3.19	VA	8	3.13
	DC	9	2.44	DC	8	2.38
	Total	32		Total	32	
Combined Criteria	PG	6	2.40	PG	9	2.72
	RV	6	1.97	RV	7	2.36
	VA	7	2.76	VA	7	2.54
	DC	8	2.49	DC	8	2.35
	Total	27		Total	31	