University of Alberta

Public Preferences for SFM: Case Studies in Tenure Policy and Forest Certification

by

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Abstract

Forest institutions are human creations that govern how actors on the forest landscape interact. Two forest institutions were examined, namely that of tenure and certification. This study focused on the preferences of a proxy for the general public for tenure characteristics, examined through the Best Worst method, and the Willingness to Pay (WTP) of the Alberta public for both Forest Stewardship Council (FSC) and Canadian Standards Association (CSA) approved printer paper, examined with respect to the individual characteristics in both a conditional logit and a random parameters logit model. The study found that there is significant regional variation with respect to preferences in tenure characteristics, and that respondents found current tenure structures least amenable to competitiveness of the forest sector. It was found that there was strong preference by respondents toward certified printer paper, but insignificant differences in WTP were discovered between FSC and CSA approved printer paper.

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List of Acronyms

AAC	Annual Allowable Cut
ASC	Alternative Specific Constant
BW	Best Worst Method
CSA	Canadian Standards Association
ENGO	Environmental Non-Governmental Organization
FSC	Forest Stewardship Council
NTFP	Non-Timber Forest Product
PAG	Public Advisory Group
RPL	Random Parameters Logit
RUM	Random Utility Model
SFM	Sustainable Forest Management
SY	Sustained Yield
WTP	Willingness to Pay

1 Introduction

Forest policies have been in a state of flux, with the traditional paradigm of Sustained Yield (SY) giving way to the paradigm of Sustainable Forest Management (SFM). SY was a paradigm concerned primarily with the production of timber (Adamowicz and Veeman 1998). Although this method did sustain timber harvests, it did not take into account the many other benefits that arise from forests. For example, mixedwood forests were generally unmixed since after harvest forests would be regenerated to monocultures. Although the practice fundamentally altered the forest, it maintained the flow of timber and therefore met the conditions of SY. Indeed, Kant (2004) explicitly states SY "…alone is insufficient for the sustainability of forests."

Another paradigm that has become more popular in the latter part of the twentieth century is SFM. However, the encompassing nature of SFM means that it must account for a plethora of different values and potentially different interpretations of sustainability (Adamowicz and Burton 2003). The need to account for many benefits rather than one has put strain on the institutions that manage forests in Canada. Canadian forest institutions[1] were created in an era of SY and have been critiqued as being too slow to respond to changes in societal preferences and not appropriately inclusive in their structure (Wellstead et al 2003, Tanz and Howard 1991, Beckley et al 1999). Although it may be argued that forest management in Canada has moved closer to SFM in the past

[1] Institutions have been defined as the human devised constraints that structure human interaction (North 1994).

few decades, institutions have been relatively slow to adopt a more socially sensitive approach. There are currently a number of institutions that affect the pursuit of SFM.

One institutional structure that sets legally binding management rules for private companies to follow is the tenure agreement. Tenure is a formal agreement between individual provincial governments and private entities. Pearse (1988) describes tenure as a system in which the provinces "…[play] the role of landlord, while the users are private parties driven by the usual market incentives." Provincial governments dictate the rules of managing a forest, and the private company is required to follow them. As a result of the importance of tenure in management practices on public forest lands, this institution becomes by necessity, an important part of SFM.

Certification of SFM is another institution that also sets rules and standards for forest management (although such rules are not legally binding). Forest certification is a method of passing information about forest management practices to the consumer of the forest product. Through this method, consumers influence management decisions by purchasing those products that are managed in a way that most closely aligns with their preferences. Ideally, consumers will determine the direction of SFM practices through their purchase decisions.

The purpose of this thesis is to explore the preferences of society toward these two selected types of forest institutions, and their perceived potential at meeting SFM objectives. The first topic of the thesis will examine the preferences of communities

toward characteristics of forest tenure and their perception of the ability of tenure to meet the SFM objectives. This analysis will provide insight into how, or even if, tenure should be changed or adjusted to be more acceptable to communities. The second topic of this thesis will examine the preferences of individual consumers toward two common certification systems, namely the Canadian Standards Association (CSA) and the Forest Stewardship Council (FSC) through the hypothetical purchase of printer paper. This second paper will examine the demographic characteristics that determine the choice of certification system and present an estimate of Willingness to Pay (WTP) for certified paper. This may yield insight into the ability of these two different certification systems to lead toward SFM.

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2 Community Preferences of Characteristics of Forest Tenure with respect to Sustainable Forest Management Objectives

2.1 Introduction

The definition of SFM is a very broad concept, encompassing many different forms of sustainability (Kant 2004, Luckert 1997, Hickey 2008, Adamowicz 2003). The most common definition of SFM, however, is the need to maintain the social, environmental and economic benefits of forests (Adamowicz and Burton 2003). One possible institution that may be used to pursue SFM is forest tenure.

Forest tenures in Canada have evolved over a relatively long history, starting shortly after the colonization by British settlers (Pearse 1988). Forests remained the property of the Crown, currently through the provincial governments, with institutions having developed accordingly (Pearse 1988). Thus, the provinces "…[play] the role of landlord, while the users are private parties driven by the usual market incentives" (Pearse 1988). This structure has lead to extensive agreements between the provincial governments and private companies on the specific aspects of resource management. These are referred to as forest tenures.

Provincial forests account for 77% of the forested area in Canada (Natural Resources Canada 2007). Since publicly owned forests account for the vast majority of Canadian forests, forest tenure takes on an extraordinary level of importance, especially in consideration of the contribution of the forest industry to the Canadian economy as a whole (Luckert and Salkie 1998). The specific structure of forest tenure has a "[profound]

influence" on the behaviour of economic actors on the forest landscape (Haley and Luckert 1990).

Despite the long history of forest tenure, there have been signs that forest tenures in their current structure may not be up to the task of meeting the requirements of SFM (e.g. Binkley 1997, Luckert and Haley 1990, McFarlane and Boxall 2000). This finding is unsurprising, since the current structure of forest tenure was built for the paradigm of sustained yield and not for SFM (Luckert 1997). One of the more common complaints about forest management has generally been that the current levels of public input do not meet expectations for public involvement. For example, McFarlane and Boxall (2000) indicated that one unifying element between the general community and Public Advisory Group (PAG) members was that they believed that community participation in forest management was inadequate.

Despite the potential importance of communities in SFM, little is known about their preferences for alternate forest tenure structures. This chapter will examine community preferences of current forest tenures, and their perceptions of how specific tenure characteristics maintain/enhance SFM objectives. This chapter will open with a review of the relevant literature. It will examine the current literature on the definition of SFM, forest tenure characteristics, and PAGs. It will continue into a discussion of the methods used for this chapter, which will include the specifics of the survey used, an overview of the ratings information, and a basic framework for Best-Worst Analysis. Finally, this

chapter will close with a discussion of the results and conclusions from the major findings.

2.2 Literature Review

This study analyzes the preferences of community representatives in PAGs towards tenure characteristics, as they relate to specific SFM objectives. The literature review will examine the idea of SFM and why the three objectives of competitiveness, environmental integrity and community stability were chosen for this study. Further, the review will discuss tenure as an aggregation of characteristics which can influence whether SFM objectives are achieved. Finally, the review will examine the current literature on PAGs.

2.2.1 SFM Objectives

SFM is a relatively recent paradigm that is meant to provide a framework to manage a forest for a wide range of benefits (Luckert 1997). This paradigm is frequently described as encompassing the economic, ecological and social dimensions of forests (Adamowicz and Burton 2003). However, due to their broad nature, these three dimensions may mean different things to different people. Our interest in this study is to obtain community perspectives of how tenure characteristics relate to specific objectives of SFM. Therefore, this study specified the terms further, focussing on very specific aspects of SFM.

Historically a primary economic goal of forest policy has been the continuation of a forest industry in forest dependent areas (Adamowicz 2003, Canadian Council of Forest

Ministers 2003). As an example of this goal, the core indicators cited by the Canadian Council of Forest Ministers for economic sustainability is the contribution of timber and non-timber forest products to the Gross Domestic Product (GDP) (Canadian Council of Forest Ministers 2003). For the forest industry to remain economically viable in the long run, it must remain competitive in the globalised market place. Therefore, in the questionnaire used in this study we specify competitiveness as "the ability of Canadian forest companies to compete in global markets. Increased competitiveness would lead to an expanding forest sector, thereby leading to more jobs and/or more capital investment" (Appendix A).

For the objective of ecological sustainability this study uses the definition of "environmental integrity" to describe the continuation of multiple factors associated with forest resources. Specifically, the questionnaire defines environmental integrity as the process of "maintaining and/or increasing environmental integrity would support enhanced biodiversity, wildlife populations, and forest recreation. Moreover, increasing integrity of the forest environment may help sustain the benefits associated with harvesting non-timber forest products (e.g. berries, mushrooms, etc.)" (Appendix A).

The social dimension of SFM is a relatively broad concept, but is generally concerned with the continuation of forest dependent communities (Canadian Council of Forest Ministers 2003). The most common descriptions of this dimension generally deal with the stability of communities and their long-term vibrancy, as well as concepts surrounding traditional aboriginal knowledge of the landscape (Canadian Council of Forest Ministers

2003). This study looks at community stability, a specific aspect of the sustainability of social objectives. Community stability in this questionnaire means that "communities are vibrant places that maintain current residents and attract newcomers. Such communities are sufficiently robust that they are able to weather economic downturns and continue to prosper. Continuous and long-term jobs and income stay within the local economy" (Appendix A).

2.2.2 Characteristics of Forest Tenures in Canada

Tenure agreements, in their most basic form, are bundles of property rights (Haley and Luckert 1990). Provincial governments assign some of these rights to private entities in order to manage and harvest Crown forests. Tenure, therefore, may be thought of as an aggregation of property right characteristics (Haley and Luckert 1990). Much as the individual characteristics of products allow for a more informative examination of consumer choice, so too does the disaggregation of tenure allow for a better examination of the preferences of tenure characteristics as they relate to SFM.

There is a plethora of different tenure characteristics that comprise provincial forest tenures (Haley and Luckert 1990). In this study, only five characteristics of forest tenure are examined: duration of tenure, level of stumpage fees paid, flexibility within operational requirements, flexibility in harvest levels and the requirement to operate a

wood processing facility. These five characteristics were chosen for this survey for their potential importance in affecting the objectives of SFM[2].

Duration of tenure refers to the "period over which property rights can be exercised"(Haley and Luckert 1990). Generally speaking, most large forest tenures in Canada have durations between 20 and 25 years[3] (Haley and Luckert 1990). The length of duration may have a significant impact on investment levels on forest land. Some studies have shown that there is a tendency for longer tenures to have higher levels of investment over shorter tenure structures (Zhang and Pearse 1996). Higher levels of investment on the forest land may encourage higher levels of productivity in the long run.

Stumpage is a fee paid to the government as owner of the resource (Haley and Luckert 1990) in return for the right to harvest trees. Although the methods of determining stumpage vary, they are generally paid on the basis of a per unit volume of wood harvested. Stumpage, although small relative to a tenure holder's total costs, may have significant implications on the production decisions of a forest manager (Luckert and Bernard 1993). Higher stumpage fees may lead a manager to focus on higher value stands, or reduce production to account for the higher costs. Further, stumpage fees paid by tenure holders will also have an effect on government revenues and, consequently, on government's ability to spend on other socially beneficial programs.

[2] This survey was designed by experts based upon their thoughts of which characteristics were the most important. The experts were Ilan Vertinsky, David Haley, and Harry Nelson, professors from the University of British Columbia, and Martin Luckert, and Peter Boxall, professors from the University of Alberta.
[3] It should be noted that the ability to renew tenure is available for most tenure types and in most provinces, however the issue of renewability is beyond the scope of this study and will only be mentioned in passing. However, it does potentially have a significant impact on the value of tenures (see Haley and Luckert 1990).

Flexibility in operational requirements refers to the constraints placed on the tenure holder's ability to determine forest level activities. Generally, these constraints have been put into place to account for various non-timber benefits of forests (Luckert 1997). Such constraints, due to their nature, must be carefully crafted. If they are too restrictive, they will likely reduce innovation and incentivise tenure holders to perform the minimum amount required to meet such regulations (Luckert 1997).

Annual Allowable Cuts (AACs) are the maximum "sustainable" levels of harvest that can be maintained on a given area. Flexibility in harvest levels is the amount by which a company is allowed to deviate from its allotted AAC (Haley and Luckert 1990). In practice, it may be economically desirable to have a tenure holder harvest more when markets are good, and harvest less when markets are bad (Luckert 1997). However, strict requirements about harvest levels would preclude an operator from this option. Not only would this reduce the benefits for tenure holders, but may also reduce the revenue that governments receive from harvesting on public lands.

Governments have typically required forest companies to operate wood processing facilities as a means of creating "value added" opportunities (Luckert 1997). Value added activities have often been perceived as a means of creating jobs, and potentially more stability, in forest dependent communities. Luckert (1997) raises several issues regarding the requirement to operate a wood processing facility. One is that there may be sound, economic reasons why a firm does not operate a processing facility in a given area.

Second, the requirement of fibre to be sent to a specific mill means that the markets for logs will likely be small, and logs will not necessarily find their highest value use. Another potential issue that is raised is the requirement of companies to be, or become vertically integrated, thus precluding the possibility of a company specializing in growing trees and another in processing timber (Luckert and Bernard 1993).

2.2.3 Public Advisory Groups (PAGs)

In this study, respondents were generally members of PAGs and some representatives of communities such as mayors and reeves. Members of such PAGs are generally chosen as representatives of a specific sub-community within the greater community (Parkins 2002). For example, if a location has a large group of snowmobilers, then a representative of this snowmobile community will be invited to be a member on the PAG.

PAGs were formed as a response to perceived insensitivity of the industry to public demands (Charnley and Engelbert 2005). It was generally hoped that PAGs would bring the demands of the public directly to the industrial users, facilitated through the increasing presence of forest certification schemes in Canada as well as public consultation clauses in forest tenures (Parkins 2008).

Though PAGs were found to provide public input, there are issues with the assumption that PAGs are a suitable representation of public opinion. One issue with a PAG is that the representatives are chosen from the general community by the industry and not chosen through some form of election. The lack of an election has the potential to lead to

special interest group membership on PAGs rather than individuals more representative of the general community (Charnley and Engelbert 2005). Further, it has been stated that there is the potential for the "capture" of PAG members. That is, the group member's preferences and opinions could change to be closer to industry's preferences and opinions (Parkins 2002). McFarlane and Boxall (2000) show that there is a tendency for the members of PAGs to have opinions closer to those of professional foresters rather than the public at large. It was found in other literature that the PAGs and the general public disagree about the sufficiency of public involvement with respect to "non-timber related activities" (Wellstead et al. 2003).

Despite the concerns over whether the opinions of PAGs represent the general public, there are some similarities between the public as a whole and PAG members. McFarlane and Boxall (2000) show that, overall, PAGs and the public in general agree that there is not enough public involvement in the management and planning of forest activities. Wellstead et al. (2003) found that PAGs and the general public held similar views about public participation when it came to what they refer to as "timber related activities".

2.3 Methods

This study was designed to assess community preferences of tenure characteristics with respect to competitiveness, environmental integrity and community stability. This section will commence with a review of the survey, specifically discussing who was surveyed, from where and what was asked. Next, a description of the methods used to analyze responses to rating questions will be delivered. Finally, a description of Random Utility

Models (RUM) will set the foundation for a discussion of the use of the Best-Worst method (BW).

2.3.1 The Survey

This study involved a community survey which was part of a larger, multi-year study of forest tenure in Canada. Specifically, the larger study was analyzing the perceptions and preferences of industry, government and communities toward forest tenure characteristics. Previous theses, based on this survey, have focused on the preferences of government and industry (Lu 2008) and investment security (Arnot 2007). The survey was designed for companies that held major forest tenures in Canadian provinces, excluding Prince Edward Island. Surveys were completed over the internet.

The respondents of the community survey were members of PAGs. PAG members were contacted through both forest companies and government officials. As a result of this contact method, we do not know the number of surveys that were sent out relative to the number of surveys returned/completed[4]. Due to this approach, a response rate cannot be created from this data set. Survey's were completed over the internet by respondents, and compiled into a data set.

Originally, 120 responses were received. Of these responses, 14 were incomplete or incorrectly completed and were removed from the data set. Therefore, a total of 106

[4] However, we do know the number of government officials and forest company employees that were contacted to pass along the survey to PAG members. Twelve industry individuals were contacted in Alberta, fifteen were contacted in British Columbia, and 19 government officials were contacted in Ontario. There is no information about Quebec and New Brunswick with regards to contacts.

usable responses from PAG members were included in the analysis. Responses were received from Alberta, British Columbia, Ontario, Quebec, and New Brunswick. Table 2-1 contains response numbers from the provinces.

Table 2-1: Number of respondents from different provinces.

Province	Alberta	British Columbia	Ontario	Quebec	New Brunswick	Total
Number of Respondents	44	29	25	6	2	106

There were three different versions of the survey given out to respondents. There were three questions for each of the three SFM objectives (i.e. competitiveness, environmental integrity and community stability), for a total of nine questions per respondent. These nine questions were incorporated into three versions of the survey in order to represent the universe of possible combinations and form the basis of the BW analysis. The survey asked respondents to choose between the most and least important tenure characteristic. The respondents were then asked to complete 16 rating questions relating to changes in the characteristics of tenures.

2.3.2 Ratings Data

Respondents were asked a series of rating questions on a five point Likert scale. Firstly, they were asked how effective the current structure of tenure was at promoting each SFM objective. Secondly, respondents were asked to rate how acceptable changes to forest

tenure characteristics would be to their communities (Appendix A). Finally, respondents were asked to rate the acceptability to their communities of adding various types of non-timber forest products (NTFPs) and carbon credits to tenure. To ease interpretation of the rating information, responses were combined into three categories: those that agreed; those that disagreed; and those that were neutral[5]. The results of this aggregation were then transformed into a percentage in each category. Significance of differences between categories was assessed using a χ^2 test against a hypothetical random distribution among the rating categories. That is, for three different categories, it was assumed that 100% of the responses would be divided by 1/3 (or 33.3% each). Differences between this hypothetical expected response and the actual responses were then examined.

2.3.3 Random Utility Models and Best Worst Analysis

Individuals are often presented with situations in which they have to weigh one object against another based on the characteristics of the object. In this study, we are asking respondents to weigh different characteristics of forest tenure against each other, with respect to specific SFM objectives. To model this trade off between characteristics, this study will utilize the RUM or more specifically a particular subset of the RUM called the BW method.

RUMs are based on the premise that individuals will choose that alternative which gives them the highest level of utility. Thurstone (1927), in some early work, referred to this as

[5] That is, those that strongly agreed and agreed were combined into "agreed", while strongly disagree and disagree were combined into "disagree." The sample size was not sufficiently large to have the extra categories add to the analysis.

the "discriminal process". The individual will observe some set of different characteristics of goods and services and make value judgements based on these perceptions. One is, therefore, able to model preferences based on the statements of survey respondents.

Generally, RUMs are based upon the assumption of linear utility functions, such as in the following format (McFadden 1986):

Equation 2-1

$$U_i = V_i + \varepsilon_i$$

where U_i is the utility of the choice of i, broken into both a systematic component, V_i, and a random component, ε_i. The systematic component may be shown as follows:

Equation 2-2

$$V_i = \sum_{k=1}^{n} x_k \beta_k$$

where V_i represents the utility of choice i, while the x represents the n attributes and/or characteristics of the object i being measured. For example, McFadden (1986) gives an example of air conditioners with various options such as quietness and cooling ability included in an analysis. The βs represent the weighting of the various attributes/characteristics in the utility function. Thus, the likelihood of an individual choosing object i is modelled on the characteristics of i (McFadden 1986).

In the form of a conditional logit (CNL) model, the calculation of the probability of a hypothetical person choosing *i* takes the following form (McFadden 1986): $U_i > U_j$ where $i \neq j$. This is equivalent to: $V_i + \varepsilon_i > V_j + \varepsilon_j$ which when rearranged, can also be shown as: $V_i - V_j \leq \varepsilon_j - \varepsilon_i$. Assuming that the error terms are Gumbel distributed, then the probability of a person choosing *i* over *j* is as follows (McFadden 1986):

Equation 2-3

$$P_c(i) = \frac{e^{V_i}}{\sum_{j \in C} e^{V_j}}$$

where the probability of choosing alternative *i* over other alternatives in some choice set *C* of alternatives *j* rests on the utility of choice *i* over all of the other possible choices *j*.

One useful extension of the RUM is the Best-Worst model (BW). BW was a method developed by Louviere and Woodworth (Finn and Louviere 1992). One of the more useful properties of this model is that it seems easier for individuals to identify "extreme options" than ranking multiple options (Marley and Louviere 2005). That is, if one is given a choice between multiple characteristics, the individual is better able to consistently identify the characteristics that grant the highest utility, and the lowest utility (Flynn et al. 2006), rather than some continuum from highest to lowest.

Although this model is an adaptation of the RUM, it creates a subtle difference in the utility equations. In the BW, the best choice is represented by the utility function (Marley and Louviere 2005):

Equation 2-4

$B_r = V_r$

The worst choice is represented by the utility function:

Equation 2-5

$W_s = -V_s$

With the final form being shown as:

Equation 2-6

$BW_{r,s} = V_r - V_s$

Where the best scenario is denoted by the subscript *r* and the worst scenario is denoted by *s*.

In equation 2-2, V_i denotes the indirect utility function of an individual toward a specific SFM objective. The SFM objectives analyzed in the survey were those of competitiveness, environmental integrity and community stability. Thus, x_k represents the k^{th} tenure characteristic including duration, stumpage fees paid, flexibility in operational requirements, flexibility in harvest levels, and the requirement to operate a wood processing facility, while β_k represents the corresponding coefficient. It is important to note that not all five characteristics could be modeled at the same time or the model

would be over identified. The characteristic of duration was left out of the model to avoid this problem.

In this analysis, we examine information surrounding the perceptions of PAG members towards different characteristics of forest tenures regarding their importance to SFM objectives. PAG members were asked to indicate the most important (or best) and least important (or worst) characteristics for maintaining or enhancing the objective. Figure 2-1 shows an example of a BW question Appendix A contains the complete survey.

Figure 2-1: An example of the questions posed to respondents for the BW analysis.

Question 1a:	Which tenure characteristic in the list below is the most important characteristic for maintaining or enhancing competitiveness, and which one is the least important characteristic? (Please check one answer in each column)

Most important characteristic (Please check only one)	Tenure Characteristics	Least important characteristic (Please check only one)
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐

This BW format was chosen because of concerns about the complexity inherent in the discussion of SFM and forest tenure. It was assumed that community members, either

PAG members or otherwise, are not intimately familiar with the forest sector. Most PAG members pursue careers outside of the forest sector (Parkins 2002). Although some studies have shown that PAG members generally rate themselves as well versed on issues of forest management (MacFarlane and Boxall 2000), there is an assumption that they do not have the background or training of a forest professional. Therefore, the study adapted a method based on what was deemed most and least important by PAG members to avoid more difficult tasks involved in a ranking or choice exercise.

Preliminary results indicated that many of the variables were insignificant because respondents from different provinces had significant differences in opinions. A province by province analysis would have been the best course of action, but due to low number of responses from some provinces, an analysis based on pooled eastern (Ontario, Quebec and New Brunswick) and pooled western (Alberta, British Columbia) Canada was performed. Dummy variables for eastern provinces were interacted with the various tenure characteristics. The non-interacted variables were then representative of the western provinces, while the sum of the interaction term and non-interaction term was representative of eastern provinces.

2.4 Results

2.4.1 Ratings Analysis

2.4.1.1 Promotion of SFM Objectives

Figure 2-2 indicates that both western and eastern respondents feel that the current system of tenure appears, overall, to promote the SFM objectives. However, it is also important

to note that competitiveness appears to be the SFM objective least served by the current structure of tenure. Respondents indicate that environmental integrity is the objective best met by the current structure of forest tenure. Based on a χ^2 test, the distribution of responses for each objective is significantly different than an expected distribution of random responses within each region.

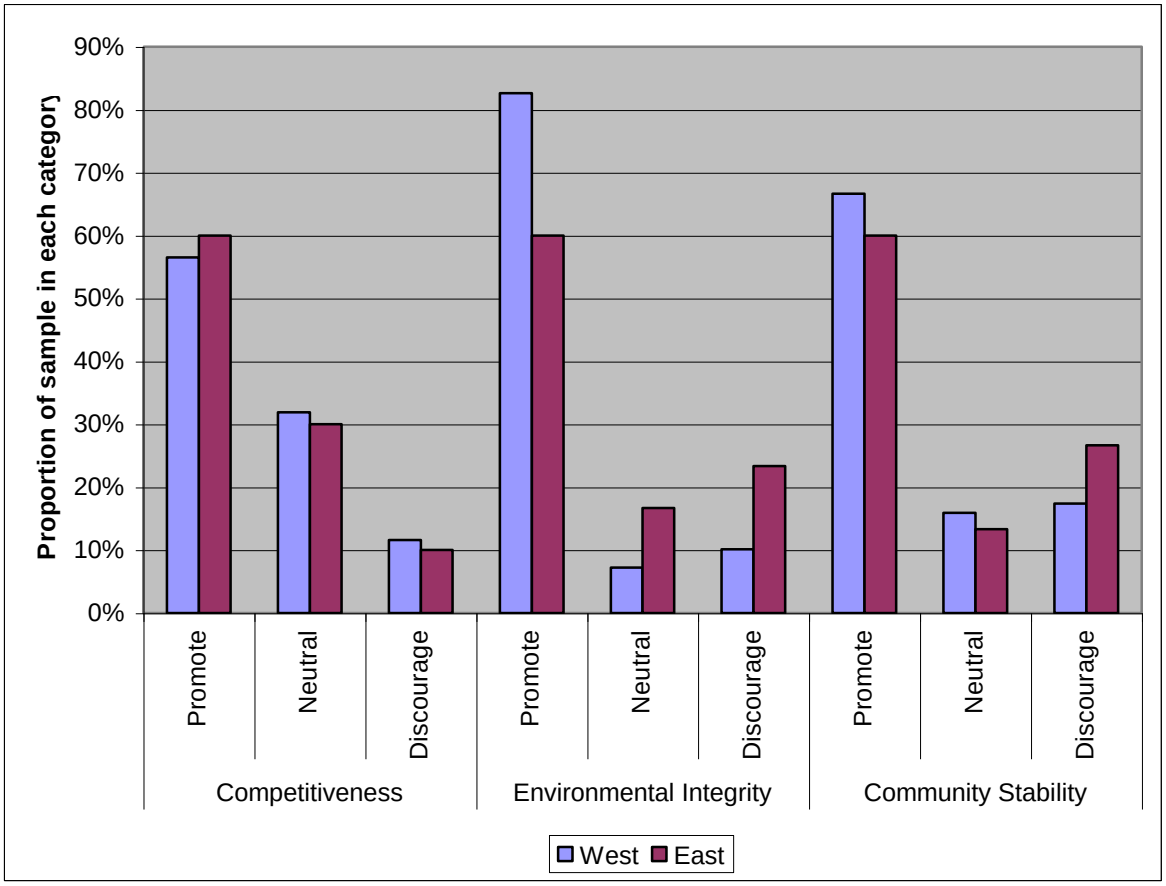

Figure 2-2: Respondents' ratings of the ability of the current tenure system to promote competitiveness, environmental integrity and community stability.

2.4.1.2 Acceptability of Changes to the Current Tenure

Table 2-2 indicates that the respondents in both eastern and western Canada were generally split in their opinion about whether or not to change a tenure characteristic. The majority of western respondents agreed with an increase in the duration of tenure, and also disagreed with a decrease in the duration of tenure. However, eastern respondents were split about increases and decreases in the duration of tenure.

Table 2-2: Percentage of western and eastern respondents that agree, disagree, or are neutral toward a change in a tenure characteristic. The χ^2 statistic indicates whether the observed responses are distributed significantly different to a random distribution of responses.

	Western Respondents				**Eastern Respondents**			
	Agree	Neutral	Disagree	χ^2	Agree	Neutral	Disagree	χ^2
Increase Duration	63.8	13.0	23.2	29.8*	43.3	13.3	43.3	5.4
Decrease Duration	15.9	17.4	66.7	34.5*	16.7	36.7	46.7	4.2
Increase Stumpage	36.2	23.2	40.6	3.4	30.0	33.3	36.7	0.2
Decrease Stumpage	29.0	37.7	33.3	0.7	10.0	33.3	56.7	9.8*
Increase Flexibility in Operational Requirements	31.9	17.4	50.7	11.6*	23.3	16.7	60.0	9.8*
Decrease Flexibility in Operational Requirements	55.1	10.1	34.8	21.0*	36.7	16.7	46.7	4.2
Increase Flexibility in Harvest Levels	49.3	17.4	33.3	10.5*	33.3	23.3	43.3	1.8
Decrease Flexibility in Harvest Levels	20.3	24.6	55.1	14.9*	40.0	10.0	50.0	7.8*

Note: The asterisks in the above table indicate that the responses differed from the hypothetical distribution of responses at the $p<0.05$ level.

For increases in the stumpage fees paid, both western and eastern respondents were split about whether an increase, a decrease, or both would be acceptable. However, more eastern respondents disagreed with decreasing stumpage rates paid. Western respondents appear split between an increase and a decrease in the flexibility allowed in operational requirements. Eastern respondents disagreed with an increase in the flexibility allowed in operational requirements. Both western and eastern respondents were, once again, split about the acceptability of changes in the flexibility allowed in annual harvest levels.

Figure 2-3 shows whether individuals agree or disagree about adding or removing the requirement to operate a wood processing facility should be added to or removed from forest tenures. The provinces of British Columbia and Ontario do not have the requirement to operate a wood processing facility as a condition of tenure. They were asked whether or not to add wood processing requirements to tenure. The provinces of Alberta, Quebec and New Brunswick currently have the requirement to operate a wood processing facility, and were asked whether or not to remove the requirement.

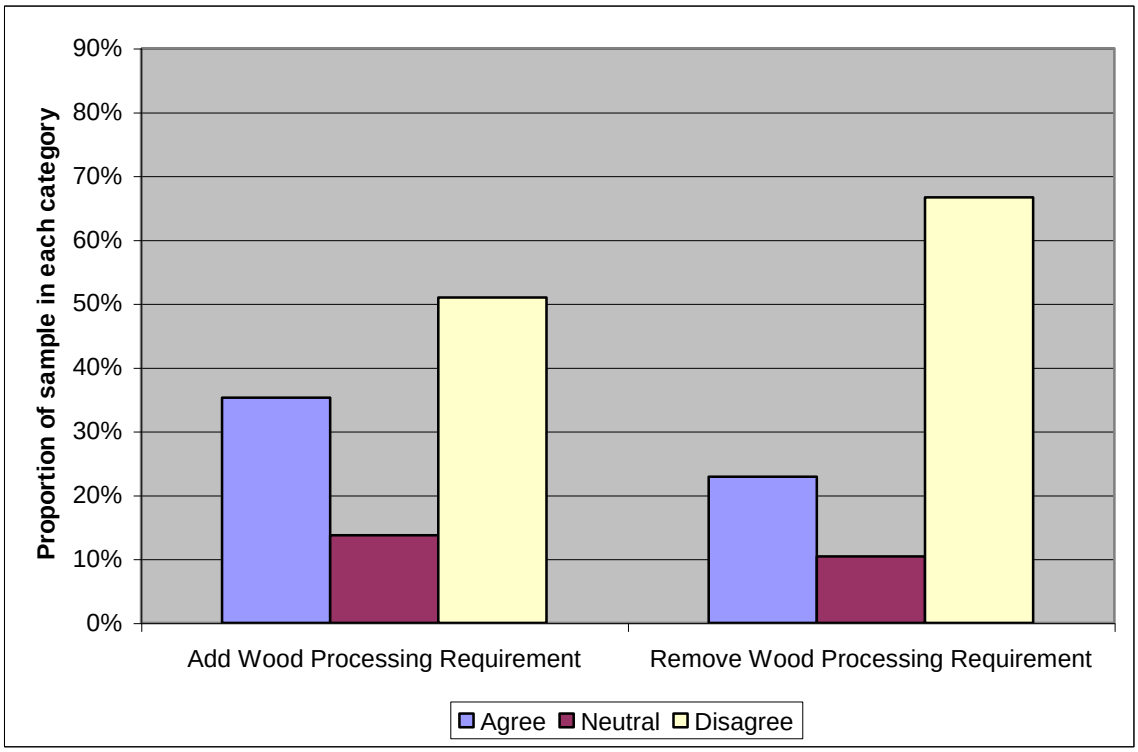

Figure 2-3: The acceptability of the addition/removal of wood processing requirements on tenure holders.

In those provinces without the requirement to operate a wood processing facility, opinion is divided about adding the requirement. In those provinces with the requirement to operate a wood processing facility, respondents strongly disagreed with removing the requirement.

2.4.1.3 Addition of Non-Timber Benefits to Tenures

Table 2-3 shows whether or not the addition of various types of non-timber benefits to tenure would be acceptable to communities. Overall, it would appear that the addition of forest recreation to tenure would be unacceptable to both eastern and western

communities. Further, both western and eastern communities would find the addition of Non-Timber Forest Products (NTFPs) unacceptable. Western communities, however, would appear to support the addition of carbon credits to tenure, while it would appear that eastern respondents are highly divided about whether or not to add carbon credits to tenure.

Table 2-3: The percentage of respondents from eastern and western Canada that agree, disagree or are neutral towards the addition of non-timber benefits to forest tenure.

	Western Respondents				**Eastern Respondents**			
	Agree	Neutral	Disagree	χ^2	Agree	Neutral	Disagree	χ^2
Add Forest Recreation	34.8	4.3	60.9	33.1*	20.0	20.0	60.0	9.6*
Add Non-Timber Forest Products (NTFP)	27.5	18.8	53.6	13.6*	23.3	20.0	56.7	7.4*
Add Carbon Credits	65.2	10.1	24.6	33.7*	36.7	33.3	30.0	0.2

Note: The asterisks in the above table indicate that the responses differed from the hypothetical distribution of responses at the $p<0.05$ level.

2.4.2 Best-Worst Results

The results of the BW analysis are shown in Table 2-4. Note that the Log-Likelihood Function shows that the models have significant explanatory power. However, the goodness of fit of the models is relatively low. The highest pseudo-R^2 is for the model of competitiveness, while the lowest is for environmental integrity. However, the goodness of fit values appear reasonable given the complexity of what is being modelled, namely preferences of tenure modelled using only five tenure characteristics. In the following section we discuss the results for each SFM objective.

Table 2-4: LOGIT coefficients (SE) for the importance of a tenure characteristic in maintaining or enhancing the SFM objectives of competitiveness, environmental integrity, and community stability.

	Competitiveness	Environmental integrity	Community stability
WESTERN CANADA			
Stumpage fees paid	0.072	-0.141	0.326
	(0.398)	(0.329)	(0.236)
Flexibility in operational	0.643***	0.004	0.136
requirements	(0.240)	(0.383)	(0.310)
Flexibility in harvest levels	1.091***	0.141	0.720**
	(0.328)	(0.329)	(0.353)
Requirement to operate a wood	-0.227	-0.882*	-0.561**
processing facility	(0.290)	(0.459)	(0.249)
EASTERN CANADA			
Stumpage fees paid	-1.293*	0.573	0.237
	(0.796)	(0.612)	(0.442)
Flexibility in operational	-0.084	0.297	0.120
requirements	(0.471)	(0.724)	(0.548)
Flexibility in harvest levels	-0.855***	0.586	0.817
	(0.594)	(0.612)	(0.653)
Requirement to operate a wood	-1.971***	1.453***	-0.261
processing facility	(0.671)	(0.820)	(0.481)
Log-likelihood at convergence	-207.6301	-228.4596	-222.9696
Pseudo R^2	0.09548	0.03207	0.05103

Note: asterisks denote statistical significance * P<10%; **P<5%, and ***P<1%.

2.4.2.1 Competitiveness

In Figure 2-2 it was shown that community members believe that competitiveness, in comparison to environmental integrity and community stability, was the SFM objective least well served by the current structure of tenure. In Figure 2-4, it was shown that two tenure characteristics were significant towards maintaining or enhancing competitiveness in the eyes of western respondents, while three tenure characteristics were found to be significant for maintaining or enhancing competitiveness with eastern respondents. It

would appear that both western and eastern respondents hold strong opinions about the effect of tenure characteristics on competitiveness. However, it is also clear from Figure 2-4 that opinions differ between western and eastern respondents.

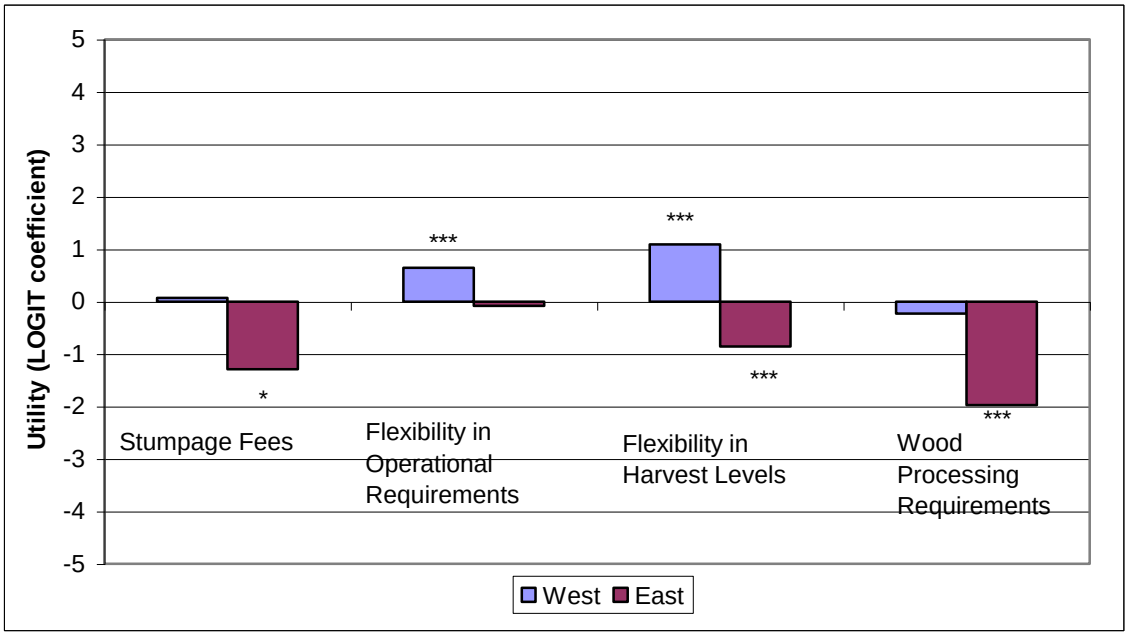

Figure 2-4: BW coefficient values for tenure characteristics' importance in maintaining or enhancing competitiveness, relative to duration of tenure.
* P<10%; **P<5%, and ***P<1%.

Eastern respondents indicate that the level of stumpage fees paid, flexibility in harvest levels and the requirement to operate a wood processing facility are less important than the base case of duration to maintaining/enhancing competitiveness (see Figure 2-4). It is interesting to note that flexibility in operational requirements is insignificantly different than duration. Because the other characteristics are significantly negative, it would appear that eastern respondents perceive duration and flexibility in operational requirements to be the most important characteristics of forest tenure towards the maintenance and/or enhancement of competitiveness. However, recall that the acceptability of changes to the duration of tenure and flexibility of operational requirements to eastern respondents was

generally divided in the ratings results. For example, while duration appears to be a relatively important characteristic to competitiveness in the east, Table 2-2 shows eastern respondents to be divided about changes in this tenure characteristic. Likewise, eastern respondents would disagree with an increase in the flexibility of harvest levels, but are split on decreasing flexibility of harvest levels.

Western respondents indicate that flexibility in operational requirements and harvest levels are more important than duration in influencing competitiveness. The level of stumpage fees paid and the requirement to operate a wood processing facility are insignificantly different than duration. Recall in the ratings analysis that western respondents indicate that an increase in duration would be acceptable (Table 2-2), but appeared divided about an increase in the flexibility of operational requirements. Western respondents did indicate that a decrease in the flexibility of harvest levels would be unacceptable (Table 2-2). Therefore, while western respondents believe that flexibility in operational requirements and harvest levels are important for competitiveness, they do not appear to be ready to support change to these tenure characteristics.

2.4.2.2 Environmental Integrity

Overall, the BW model suggests that community members see little connection between the tenure characteristics and environmental integrity (Fig. 2-5). The only tenure characteristic that was found to be significant in maintaining or enhancing environmental integrity, relative to duration, was the requirement to operate a wood processing facility (Figure 2-5). While eastern respondents indicated that the requirement to operate a wood

processing facility was more important than duration, the western respondents indicate that it was less important. This general insignificance of results correspond to the information present in Figure 2-1 that indicated respondents believe environmental integrity was the SFM objective best met by the current structure of forest tenure.

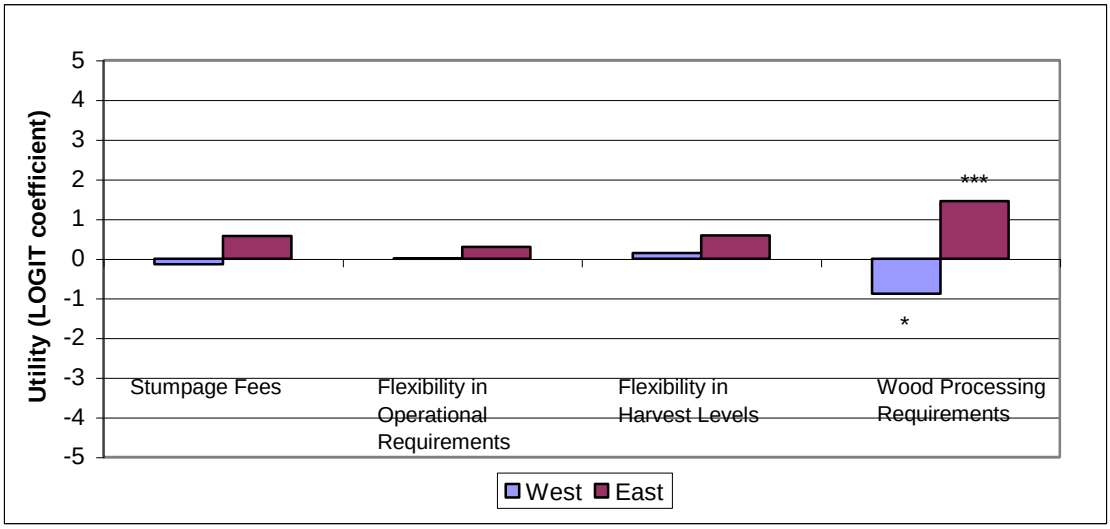

Figure 2-5: BW coefficient values for tenure characteristics' importance in maintaining or enhancing environmental integrity, relative to duration of tenure.
* P<10%; **P<5%, and ***P<1%.

2.4.2.3 Community Stability

In Figure 2-6, we see that no tenure characteristics were found to be significant for eastern respondents toward maintaining or enhancing community stability relative to duration. Western respondents indicate that flexibility in harvest levels is more important than duration and the requirement to operate a wood processing facility is less important than duration. In the ratings results, Table 2-2 showed that western communities would disagree with a decrease in the flexibility of harvest levels. But there was no corresponding acceptability towards an increase in the flexibility of harvest levels. The

requirement to operate a wood processing facility was deemed less important to community stability, relative to duration.

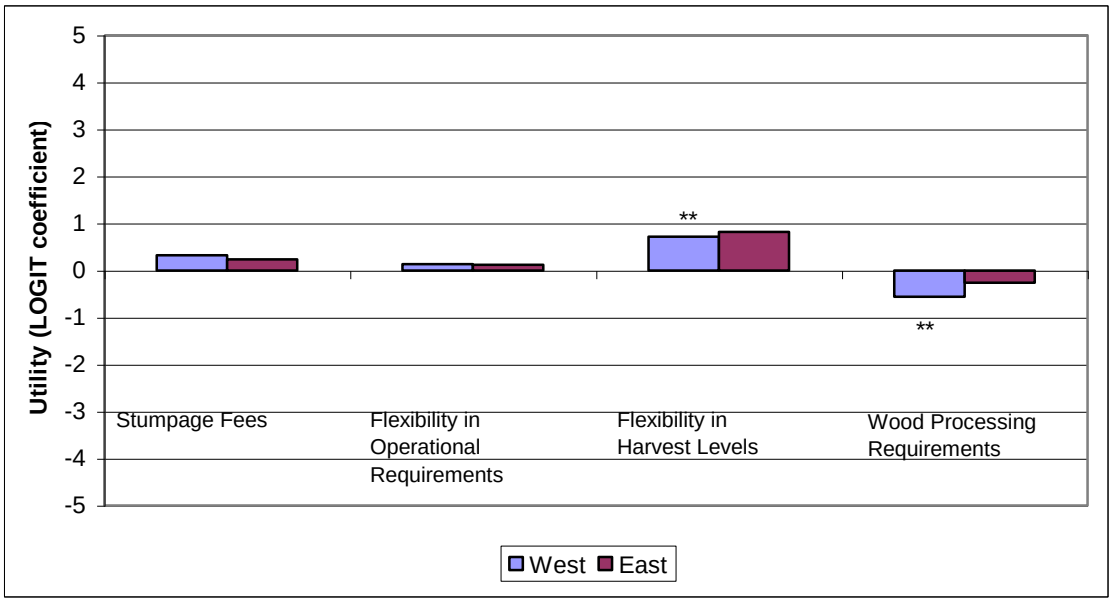

Figure 2-6: BW coefficient values for tenure characteristics' importance in maintaining or enhancing community stability, relative to duration.
* P<10%; **P<5%, and ***P<1%.

2.5 Conclusions

Overall, it would appear that respondents in both western and eastern Canada believe that the current structure of tenures meet the objectives of competitiveness, environmental integrity, and community stability. Respondents indicated that competitiveness was promoted least well by the current structure of tenure. This could explain why all of the tenure characteristics were significant in the BW analysis for competitiveness. Interestingly, respondents indicated that environmental integrity was the objective best served by the current structure of tenure.

This study indicates that community members in those provinces with the requirement to operate a wood processing facility strongly oppose their removal. However, those provinces without the requirement appear to be split over the reinstatement of a requirement to operate a wood processing facility. This study would suggest that the removal of such requirements may be politically costly in the short term. This study also indicates that community members in both western and eastern Canada would be against the addition of non-timber benefits of forests to tenure that are currently used by the community (e.g. berry picking, camping, etc.). It would appear that only the addition of carbon credits to tenure would be considered acceptable to western communities, with eastern opinion divided on the issue.

The support from forest communities for government to alter tenure characteristics may be limited. It would appear that those characteristics deemed the most important to an objective are also generally the characteristics for which there is little acceptability toward change from community members. Perhaps this is a sign that those characteristics that are the most important are also the characteristics over which there is the greatest breadth of opinion within communities. Despite this difficulty, the study indicates that duration would, among community representatives, be the least controversial tenure characteristic to change, followed by changes to the level of stumpage fees paid and the flexibility in annual harvest levels. Further, this study indicates that the acceptability of changes to tenure characteristics varies regionally. Therefore, any changes to tenure characteristics would have to be tempered to local preferences.

2.6 Caveats

There are two caveats that must be mentioned. First, the respondents in this analysis were primarily members of PAGs. It was shown in the literature review that PAGs, while from the community, might not be representative of the community. Specifically, it was shown that PAG members have similar opinions to that of industry. Although this does not negate the results of this study, it does necessitate some caution in attempting to expand these results to the larger population.

Another issue was that Alberta and British Columbia comprise the majority of respondents. Although this is not by itself a problem, it does mean that the analysis may not be as robust nationally as it could have been. In future research, a higher level of responses from eastern Canada would be preferred.

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3 Consumer Preferences for Canadian Standards Association and Forest Stewardship Council Certified Paper.

3.1 Introduction

While forest tenures in Canada are structures created and monitored by provincial governments, forest certification is an attempt at "non-state, market-driven governance" (Cashore et al. 2005). Specifically, certification is an institutional framework put in place to compensate for perceived faults in policy at addressing the non-market values of forests throughout the world (Golec and Luckert 2008). Forest certification was created after the failure of the Rio de Janeiro "Earth Summit" environmental conferences to put into place gobal forest management guidelines (Cashore et al. 2005, Golec and Luckert 2008).

Generally, the premise of certification is to correct information asymmetry between the consumer and producer through the labelling of products that conform to relatively high standards of forest management (Teisl 2003). It is hoped that through this mechanism, consumers will drive forest management standards by purchasing certified products rather than non-certified products. Therefore, both the familiarity with and the value that consumers place on certified forest products are important for certification to provide price signals to private companies, moving them towards SFM.

Traditionally, there have been two general questions raised about the effectiveness of environmental certification: Do consumers prefer certified products to non-certified

products, and are they willing to pay a premium? There is significant evidence suggesting that individuals do indeed prefer environmentally certified products to the alternative (Teisl 2003). So the question then becomes, would an individual be willing to pay a price premium for the knowledge, certified by some known entity, that the forest producing the product is being managed sustainably for a multitude of different benefits? Moreover, are there clear preferences for one certification system over another? Further, what personal characteristics of consumers influence their decisions[6]?

This chapter intends to examine the preferences of Albertans toward printer paper purchases between the Canadian Standards Association (CSA), Forest Stewardship Council (FSC) and non-certified paper. This chapter will examine whether or not there is a distinct preference for either the CSA or FSC certification systems, and also whether or not there is a positive willingness to pay (WTP) for certified printer paper. This chapter will begin with a review of the literature on forest certification, specifically focussing on the issues of certification and some significant differences between the CSA and FSC standards. It will describe the methods used, namely the manner in which the survey was distributed, the comparison between the sample and the population of interest, and the analysis of the preference data. Finally, this chapter will end with a discussion of the results of the study.

3.2 Literature Review

This literature review focuses on two specific topics: the issues surrounding certification and the major differences between the CSA and FSC standards. The issues surrounding

[6] The personal characteristics of individuals are of importance to marketers, and may enable producers to target specific groups.

certification include the theory behind certification, the methods by which information about certification is passed on to consumers, the effectiveness of these methods, and what previous literature has found regarding price premiums on certified products. This review will also discuss the differences between the CSA and FSC standards of forest certification. Although relatively similar in structure, these certification standards exhibit specific differences that both alter their acceptability to various groups and may influence how effectively they are able to move companies toward SFM.

3.2.1 Issues of Certification

Aguilar and Vlosky (2008) indicate that architects and housebuilders ask the question of "*why* they should prefer certified products over non certified ones [?]" It is because their customers ask themselves the question of why they should choose a certified product over a non-certified one, holding other characteristics such as quality constant. This question could be answered, in part, through both what a certification system tells consumers about forest practices and the values of those consumers towards forests (Teisl 2003, Ozanne and Vlosky 1997).

Forest certification is a method of relaying information about the effectiveness of forest management at meeting the three dimensions of SFM, namely the economic, ecological and social (Aguilar and Vlosky 2008, Rickenbach and Overdevest 2006). In this context, it is hoped that greater levels of information passed on to consumers may reward companies that are managing forests well with higher premiums on products, increased market share, or both, as consumers adjust their purchasing decisions to suit their

personal values (Haener and Luckert 1998, Teisl 2003, Sedjo and Swallow 2002). In essence, consumers themselves would drive SFM through market forces.

The value of a certified forest product is determined by the amount and quality of information that is passed on to the consumer by a certification label, by a consumer's familiarity with a certification system, and their individual preferences (O'Brien and Teisl 2004). In the psychology literature, there is evidence that individuals who are familiar with a face will rate it as more "credible" than faces that are unfamiliar (Brown et al. 2002). In terms of certification, it may be hypothesized that those more familiar with one particular certification scheme are more likely to deem it as credible and, potentially, place greater value on the certified product. However, one specific study conducted in western Canada indicated that very few individuals have heard of or have specific knowledge of forest certification (Kozak et al. 2004). Therefore it may be assumed that, without prior knowledge of certification, it is unlikely that consumers will place a high value on certified forest products in actual market situations.

The specific manner in which information is passed along to the consumer matters a great deal with respect to the value placed on certified forest products. Greater levels of information are generally better received than those of simple "eco-seals" (Teisl 2003). Such a finding is especially important in the current context since most certified products carry a relatively simple eco-seal, including those systems in this study. However, while simple eco-seals are considered a poor choice to pass along information about certification, excessive information has also been found to negatively influence a

consumer's choice of certified forest products (Teisl et al. 2002). While some findings (Ozanne and Smith 1998) indicate that Environmental Non-Governmental Organizations (ENGO) certification schemes are better received than private, industrial or governmental schemes, Teisl (2003) found that government agencies were perceived as more credible by consumers than FSC certified wood products (a system strongly endorsed by ENGOs). As well, O'Brien and Teisl (2004) found that other characteristics of the product also have an effect on the value of certification. For example, one such variable is the locale of the product.

Becoming certified is not a costless endeavour for a forest company. There are a multitude of costs associated with certification, such as complying and maintaining compliance with a certification system, collecting the necessary data to manage the forest more effectively, and tracking custody chains (Haener and Luckert 1998). In fact, Larson (1999) states that the costs of certification to the FSC standard may be prohibitive to U.S. landowners in possession of less than 10,000 acres of forested land. Due to these costs of certification, it may become prohibitive for a company to follow multiple certification schemes. Likely, companies will be required to focus on one, or at most, only a few certification schemes. Some studies have shown that as companies learn more about the presence and depth of local certification initiatives, they will generally prefer these local schemes over international standards such as FSC (Cashore et al. 2005). However, Cashore et al. (2005) postulate that the differences between the FSC standard and other standards may make them complements rather than substitutes.

Some previous studies that have focused on wood products have shown that consumers state that they are willing to pay a price premium for certified forest products (Kozak et al. 2004, Ozanne and Vlosky 1997, 2003). Forsyth et al. (1999) found that approximately 67% of respondents stated that they would be willing to pay a price premium of 5% for certified forest products. Ozanne and Vlosky (1997) found that the stated WTP for a certified forest product varied depending on the product, from a low of 4.4% for a $100,000 home to a high of 18.7% for a 2x4 stud costing $1.00. Teisl et al. (2002) found that consumers are relatively indifferent to certification on large, rarely purchased products but perceive a good deal of importance on more frequently purchased and inexpensive items such as printer paper, the specific focus of this study. It has been shown that region also appears to play a role in influencing WTP (Kozak et al. 2004). Therefore, findings likely have to be analyzed according to both the product in question as well as the region being studied.

3.2.2 Comparison of the Canadian Standards Association (CSA) and Forest Stewardship Council (FSC) certification systems

The CSA certification scheme was developed to provide a "Canadian" point of view toward SFM. It is based upon the ISO 14000 management framework (Canadian Standards Association 2002), and enforced through a series of third party independent audits. The planning manual for the CSA has very little in the way of prescriptive guidelines or final management goals. The CSA leaves the creation of values, objectives, indicators and targets up to the forest company and public representatives (Canadian Standards Association 2002). Such a structure, it has been assumed, allows local concerns

and knowledge to be explicitly taken into account in forest management planning. However, such a structure has also been open to the criticism that it merely rubberstamps current practices (Tan 2003).

The FSC standard came into existence in 1993, and arose out of ENGO dissatisfaction with the general lack of consensus over international forest management standards (Golec and Luckert 2008). Officially, its mission is to "promote environmentally appropriate, socially beneficial, and economically viable management of the forests of Canada through standards and their application" (Forest Stewardship Council 2004). The standards of the FSC were devised out of extensive discussions between ENGOs and academia. For the majority of Canada, but especially in the Albertan context, this discussion culminated in the FSC Boreal Standard of forest management.

The FSC and CSA certification standards appear very similar, and indeed are very similar on many of the more salient issues. However, there are a few key areas where the two diverge. The first is the requirement of the FSC to monitor the greater public's opinion of the job that is being done by the forest company (Forest Stewardship Council 2004). While both the CSA and FSC standards require the public to be consulted, the requirements in the FSC standard are more onerous on the part of the managing entity.

A second key difference is that the FSC standard does restrict some operational activities of companies; primarily restrictions on the use of pesticides in forest operations (Forest Stewardship Council 2004). The FSC standard dictates that, barring an appeal that

operational costs would be excessive without their use, pesticides should be phased out of operations in favour of other methods. The CSA has no such specific requirement in place.

A third difference between the CSA and FSC standards is the degree of inclusion of Aboriginal peoples into the various stages of planning (Forest Stewardship Council 2004). While both standards dictate that aboriginal rights should be respected[7], and the pertinent aboriginal tribes are included into any planning process, the CSA is less descriptive over what constitutes aboriginal rights (specifically treaty rights). Effectively, the CSA standard leaves specific rights up to the discretion of governmental/legal entities of the country. The FSC does state that aboriginal rights to land, even if officially given up in a treaty process, should be included in any planning process. This appears to require that forest companies under the FSC standard must ensure that the level of consultation with aboriginal groups be much stronger than the CSA standard.

Finally, it should be noted that the FSC standard is generally the only certification scheme endorsed by ENGOs (Tan 2003, Alberta Wilderness Association, Albertans for a Wild Chinchaga, Canadian Parks and Wilderness Society - Edmonton Chapter, and the Federation of Alberta Naturalists 2001). Generally, the critiques of other certification systems have been that they merely "rubber stamp the status quo" (Tan 2003). Specific to the CSA standard, the local construction of values, objectives,

[7]This bundle of aboriginal rights appears to include traditional areas occupied, as well as sites of specific cultural significance.

indicators and targets gives rise to the fear that corporations will wield influence over the process in order to give the credibility of certification to current practices.

The distinction between FSC and CSA is an integral part of the overarching question that this paper examines; that is, whether consumers of printer paper prefer certified to non-certified printer paper. In the questions described below, we distinguish between the two certification schemes and subsequently assess whether there are marked differences in characteristics of people who choose one or the other.

3.3 Methods

The methods section will describe the steps taken in this study. Specifically, this section will describe the recruitment for and structure of the survey that assesses preferences for certified paper. It will describe the methods employed to determine whether the sample was representative of the target population and the knowledge of forest certification of the sample. The methods section will describe the underlying theory used to assess preferences for certified paper (a random utility model) and finish with a description of some econometric procedures used to assess consumer preference heterogeneity.

3.3.1 Survey

Data to investigate the research question were obtained through a web-based questionnaire. Leger Marketing, a research company with regional offices in Edmonton, administered the survey. The company recruited individuals throughout Alberta who

purchased computer paper products to participate in this survey over the telephone. Recruits were invited to complete the survey online.

There were three main components to the questionnaire. The first component was concerned with forest related beliefs, activity levels, and environmentally conscious behaviours of the respondent. The second component was a choice experiment.

It was assumed that there was the potential that respondents were unaware of forest certification. Therefore, information on the characteristics of the CSA standard and the FSC standard were given to respondents (Figure 3-1).

History

Forest certification emerged in the late 1980s in response to concerns about forest management practices, calls for boycotts of certain wood products, and disillusionment with the failure to improve forest management through regulatory or 'command and control' mechanisms. The 1992 United Nations Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro brought to light the need for concrete action on the issue of forest conservation. Forest certification evolved as a potential instrument through which sustainable forest management (SFM) could be promoted throughout the world. SFM is a concept specifically designed to incorporate different interests and values of forests to include the maintenance of ecosystem services (e.g. biodiversity, watershed protection) and social interest, with the extraction of timber and non-timber forest products. The following section describes two common types of forest certification upon which this survey is based.

The Forest Stewardship Council (FSC) Certification in an international, membership based, non – profit organization that supports environmentally appropriate, socially beneficial, and economically viable management of the worlds forests.

The Canadian Standards Association (CSA) is also an international organization that is a provider of product testing and certification services. They published a Canadian standard for sustainable forest management (SFM). The standard requires a comprehensive SFM plan and on the ground performance standards.

	FSC	CSA
Establishment	in 1993	in 1996
Membership (includes forest and non-forest companies)	Membership based, with more than 550 members from 67 countries	Membership based, with approximately 30 forestry based members
Required or Voluntary	Voluntary	Voluntary
Forest Certification scheme influenced or created by	Environmental Non-governmental Organizations (ENGO), Timber Industry, Forestry Profession, Aboriginal Organizations, & Community forestry groups	Representatives from ENGO's, Government, Industry, Academic, and Consultant Organizations
Standards	Performance and Process based standards	Performance based standards
Supported by	ENGO's	Canadian Government & Forest Industry
Level of Canadian Certification (million Hectares) as of 2006	26.8 million hectares	71.7 million hectares

Figure 3-1: Information given to respondents regarding CSA and FSC certification that was developed from information provided on their respective websites.

The experiment was designed as a utility balanced[8], full factorial design, with all choice combinations being asked across the sample of respondents. Respondents were asked to respond to one of eight different versions of the survey, each asking seven different choices of paper questions with associated prices and certification schemes. Each of those seven questions asked the respondent to choose between non-certified paper and two other alternatives consisting of either CSA or FSC certified paper (Figure 3-2).

While non-certified paper was always placed in the first or leftmost column, the CSA and FSC choices were allowed to vary between the second and third columns. Further, while non-certified paper was held constant at a price of $5.00 per package, the prices of CSA and FSC choices were allowed to vary between $5.00 and $7.00 at $0.50 intervals. Thus, 25 different price points were used in options B and C.

1. On your next purchase of a 500 sheet package of computer paper, if the following options were the only ones available, which one would you choose?

Option A	Option B	Option C
Non-certified	CSA	FSC
$5.00 per package	$5.00 per package	$6.00 per package

Note: Refer to Appendix B for more information.

Figure 3-2: An example of the questions asked in the questionnaire.

[8] Utility balanced, in this context, implies that the three different types of paper (i.e. non-certified, CSA and FSC certified) were placed into a table, with their corresponding price levels (please see Appendix C). While non-certified paper was held constant at $5.00, CSA and FSC were allowed to vary between $5.00 and $7.00 at $0.50 intervals. Further, the position of non-certified paper was always in the first column, while CSA and FSC were allowed to vary in their position. From the table, shown in Appendix C, a balanced selection of choice sets were created to ensure no particular individual received a poorly weighted survey.

The base price of $5.00 per package was obtained through an informal review of office supply companies in Edmonton. It was found that bulk purchases of paper had an approximate price per 500-sheet package of paper of $5.00. It was then determined that a range of prices of 20% above the base price was a reasonable amount to be able to approximate the upper bound of WTP.

The eight different versions varied only in the component of the survey that evaluated willingness to pay (please see Appendix B). Finally, the survey ended with questions asking for demographic characteristics, such as gender, income levels, and the number of dependent children in the respondent's home.

3.3.2 Representativeness of the Sample

The sample population was compared to the population of interest, in this case Alberta. This was done to assess whether or not the sample was representative of the population. Information was obtained from the Canadian Census for 2006 and the Statistics Canada ESTAT website function (Statistics Canada 2007, Statistics Canada No date), and analyzed. The Census data were then compared to the analyzed sample data.

3.3.3 Knowledge of Forest Certification

The respondents were asked a question regarding their knowledge of forest certification prior to taking the survey. This question was included due to the potential importance of prior knowledge of forest certification for an individual to develop a willingness to pay

for certified forest products. The information was taken as a percentage of the sample that had heard of forest certification prior to taking the survey.

3.3.4 Understanding Respondents' Ecocentric Orientation

3.3.4.1 Involvement with the Environment

Figure 3-3indicates the respondent's behaviour regarding recycling and outdoor activities. Almost all of the respondents recycle and a large majority participate in forest related activities between 1 and 10 times per year.

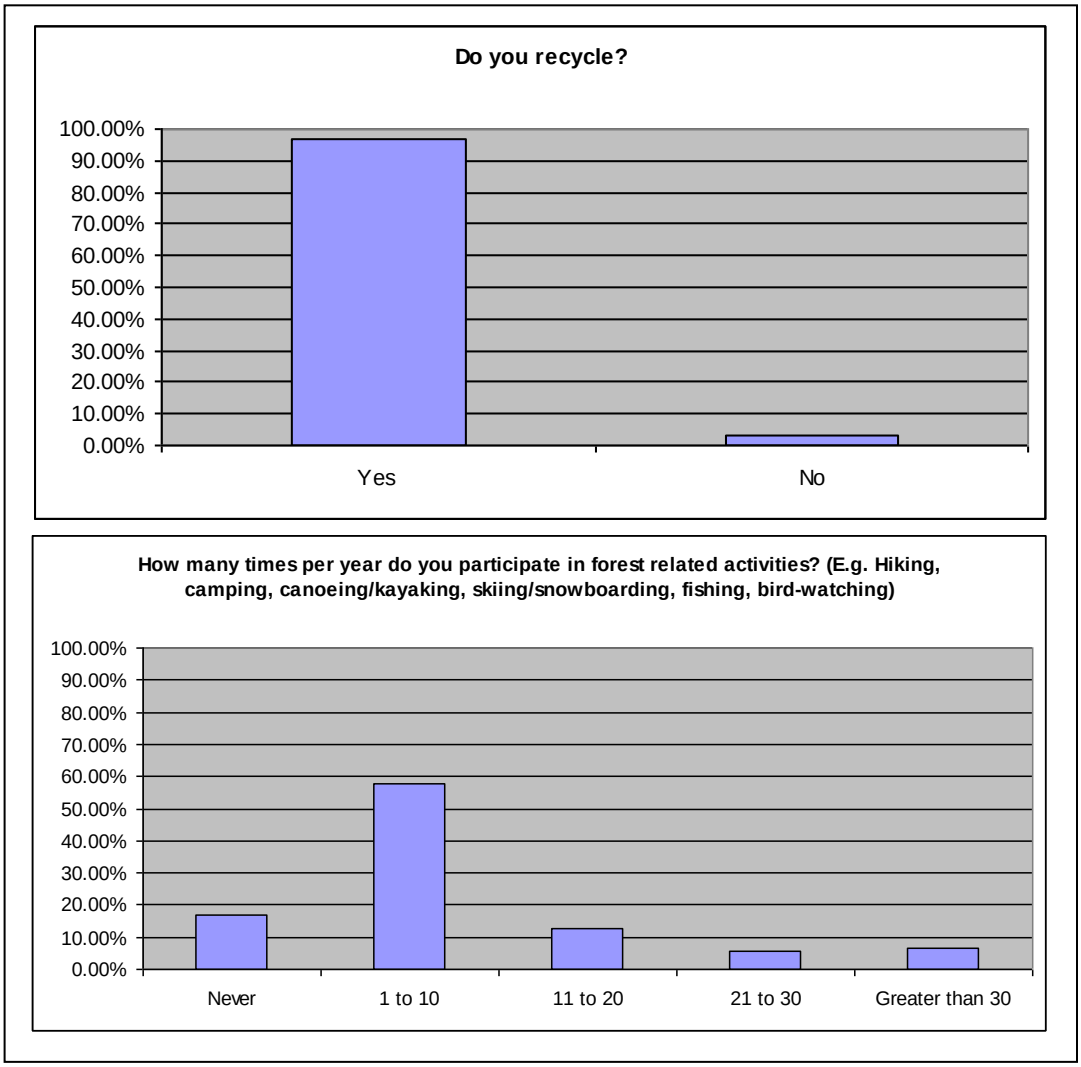

Figure 3-3: Frequency in which respondents fall into different categories for their interaction with and views about the environment.

3.3.4.2 Forest Values Scale

In order to understand a respondent's level of concern with environmental issues, a series of rating scale questions, developed by McFarlane and Boxall (2000), were used. A measure of this concern (a variable called ECOCENTRIC) was constructed from specific questions in this Forest Value Scale. The Forest Value Scale is comprised of 16 questions designed to elicit an individual's beliefs towards forests. Eight of those questions are designed to have a pro-environmental context. Each of the questions was based on a five-point Likert scale. The five different points, from Strongly Agree to Strongly Disagree were given weightings 2,1,0,-1,-2, and then the ratings for the 8 relevant scale items were summed for each respondent. A final score ranging between –16 and 16 was thus obtained for each respondent. This value was used in the ECOCENTRIC variable.

Table 3-1[a]: An example of the scale items used to create the ECOCENTRIC variable.

Scale Items	Average
Whether or not I get to visit the forest as much as I like, it is important for me to know that forests exist in my province	4.61
Forests should have the right to exist for their own sake, regardless of human concerns and uses	4.17
Forests are sacred places	3.75
It is important to maintain the forests for future generations	4.62
Forests should be left to grow, develop and succumb to natural forces without being managed by humans	3.08
Forests let us feel close to nature	4.43

Forests rejuvenate the human spirit	4.20
Wildlife, plants, and humans should have equal rights to live and develop	3.63
Forests should be managed to meet as many human needs as possible	3.13
Forests give us a sense of peace and well being	4.51
Forests should exist mainly to serve human needs	2.03
Forests that are not used for the benefit of humans are a waste of our natural resources	1.76
If forests are not threatened by human actions, we should use them to add to the quality of human life	3.82
Forests can be improved through management by humans	3.54
The primary function of forests should be for products and services that are useful to humans	1.98

a: Each of these questions was rated on a 5 point scale from 1 equals strongly disagree, 3 equals neutral and 5 equals strongly agree. The average score from 1 to 5 is given for each question. The highlighted cells denote the values used in the construction of the ECOCENTRIC variable

3.3.5 Preferences for Certification: the Random Utility Model

In order to analyze data from the choice experiment, a random utility approach was used. Random utility models (RUMs) are based on the premise that individuals will choose those goods and services that give them the highest level of utility. Utility for an object *i* is composed of systematic and random components:

Equation 3-1

$U_i = V_i + \varepsilon_i$

where U_i is the utility of the choice of i, V_i is and indirect utility function and the systematic component, and ε_i the random component. The systematic component commonly is expressed as a linear combination of attributes of i and can be shown as follows:

Equation 3-2

$$V_i = \Sigma x_k \beta_k$$

where V_i represents the utility of choice i, x represents k attributes and/or characteristics of the object i being measured, and β_k is the parameter or taste weight associated with the relevant attribute. McFadden (1986) gives an example of air conditioners with various options such as quietness and cooling ability included in an analysis. Thus, the β parameters would represent the weighting or importance of the various attributes/characteristics of the air conditioner to the consumer.

McFadden (1986) develops the theory in a probabilistic manner where the probability of choosing alternative i over alternative j may be shown as follows:

Equation 3-3

$$U_i > U_j$$

This is equivalent to:

Equation 3-4

$$V_i + \varepsilon_i > V_j + \varepsilon_j$$

and rearranged, this equation may also be shown as:

Equation 3-5

$$V_i - V_j \leq \varepsilon_j - \varepsilon_i$$

Assuming that the error terms are Gumbel distributed, McFadden (1986) shows that the probability of a person choosing *i* over *j* is as follows:

Equation 3-6

$$P_c(i) = \frac{e^{Vi}}{\sum_{j \in C} e^{Vj_j}}$$

where the probability of choosing alternative *i* over *j* rests on the utility of *i* over *j*, within some choice set of alternatives *C*. This econometric model is typically called the conditional logit model, as the realized utility of an object is conditional on its choice. Specifying the *V* terms in this expression as linear indirect utility functions with taste weights β (see equation 3-2) it becomes possible to determine individual preferences associated with the choice of various alternatives.

The empirical specification of the indirect utility function used to understand preferences for certified paper in this study is quite simple and is as follows:

Equation 3-7

$V = \alpha_{CSA}CSA + \alpha_{FSC}FSC + \beta PRICE.$

where FSC is an alternative specific constant (ASC) for FSC certified paper, CSA is an ASC for CSA certified paper and PRICE is the price of a package of paper in Canadian dollars. The α terms represent the weighting of the choice of FSC and CSA certification schemes, while β represents the marginal utility of income. The choice of the non-certified paper alternative was omitted from this specification as a base-case, with a constant price of $5.00. Thus, the preferences of FSC and CSA are compared relative to this base case, with similar or higher prices ranging from $5.00 to $7.00.

3.3.5.1 Random Parameters Logit (RPL) Model

A generalization of the multinomial logit model is the random parameters logit (RPL) model, or mixed logit model (Train 1998). The RPL has been put forth as a more robust and useful model for estimating individual preferences than the conditional logit model. The coefficients are allowed to vary randomly across individuals in the RPL (Train 1998, Boxall et al. 2009). This means that the RPL does not exhibit the Independence of Irrelevant Alternatives (IIA) property of the standard conditional logit models. Further, the distribution of the random parameters may be specified within the RPL model. In this analysis, we assume that the taste weight parameters are normally distributed random parameters. Halton draws were used, with 150 simulations performed in a maximum simulated likelihood estimation. This allows one to model choice as a random parameter, in this instance the choice of FSC or CSA certified paper, while those individual characteristics that affect choice are held as non-random (Boxall et al. 2009). It is hoped that the use of the RPL may better capture heterogeneity in preferences for certified paper among consumers.

Recall that the empirical specification of the indirect utility function was: $V = \alpha_{CSA}CSA + \alpha_{FSC}FSC + \beta PRICE$. The RPL was used to investigate heterogeneity in preferences for CSA and FSC certified paper independent of price. To do this, the two ASCs (α_{CSA} *and* α_{FSC}) were specified as normally distributed random parameters: $\alpha_{CSA} \sim N(\eta_{CSA}, \sigma^2_{CSA})$; $\alpha_{FSC} \sim N(\eta_{FSC}, \sigma^2_{FSC})$. The empirical specification of the means of these

random ASCs involved interacting the CSA and FSC ASCs with various respondent characteristics. Thus, the means were specified as follows:

Equations 3-8 and 3-9

$$\eta_{CSA} = \gamma^1_{CSA} + \gamma^2_{CSA} EDUC + \gamma^3_{CSA} ENV\ PURCH + \gamma^4_{CSA} SMALL + \gamma^5_{CSA} NEWSPAPER + \gamma^6_{CSA} FURNITURE + \gamma^7_{CSA} ECOCENTRIC + \beta PRICE$$

$$\eta_{FSC} = \gamma^1_{FSC} + \gamma^2_{FSC} EDUC + \gamma^3_{FSC} ENV\ PURCH + \gamma^4_{FSC} SMALL + \gamma^5_{FSC} NEWSPAPER + \gamma^6_{FSC} FURNITURE + \gamma^7_{FSC} ECOCENTRIC + \beta PRICE.$$

These specifications of the mean shifts arose after trying estimating various RPL models with different variables (such as the income level of respondents, the number of children per household, the level of forest activity, etc.). All other individual characteristics were found to add little to nothing to the specifications.

The RPL model essentially estimated average coefficients for ASCs representing the choice of CSA and FSC certified paper (η), shown on the right of Equation 3-7. However, in equations 3-8 and 3-9 these ASCs are partitioned into various components representing the characteristics of the respondents. The variables on the right side of the equation will shift the mean coefficient, η, by γ times the characteristic value. For example, if we assume the variable EDUC has a positive sign for the choice of FSC, it will increase the mean coefficient for the ASC representing FSC certified paper. Note that the part of the ASC not explained by these characteristics (γ^1_{CSA} and γ^1_{FSC}) represents the remainder of the original ASCs depicted in equation 3-7 (α_{CSA} and α_{FSC}).

Descriptions of the individual specific characteristics used in the RPL model and the expected signs of those variables are presented in Table 3-2. EDUC was included to examine the effect of post-secondary education on the choice of certified printer paper. This variable signified whether or not an individual has completed some level of post-secondary education, from certificate diploma level to post-graduate education. Previous research indicated an insignificant relationship between the willingness to pay a premium for certified forest products and the education level of respondents in Ontario (Spinazze and Kant 1999). Therefore, this present study had no prior expectation for the sign of this coefficient.

ENV PURCH indicates whether an individual purposely sought environmentally friendly products. The sign was expected to be positive because it was assumed that those individuals who seek environmentally friendly products would be willing to purchase certified printer paper.

Table 3-2: Definitions of the mean shift components used in the RPL choice model.

Variable name	Description	Expected sign	Average Sample Value
η_{CSA} / η_{FSC}	The mean coefficient value for the choice of CSA or FSC.	+	N/A
EDUC	Respondents indicated whether or not they had completed some level of post-secondary education. Yes = 1, No = 0.	No expectation	0.85
ENV PURCH	A binary variable whether or not the individual seeks out environmentally friendly products. Yes = 1, No = 0.	+	0.50
SMALL	Whether an individual purchases less than one package of 500-sheet printer paper per year. Yes = 1, No = 0.	+	0.45
NEWSPAPER	Respondents indicate whether they sometimes consider their environmental impact when purchasing newspapers and magazines. Yes = 1, No = 0.	+	0.39
FURNITURE	Respondents indicate whether they sometimes consider their environmental impact when purchasing furniture. Yes = 1, No = 0.	+	0.32
ECOCENTRIC	Obtained from the Forest Value Scale (McFarlane and Boxall 2000). The ecocentric score ranged from a possible low score of -16 to a possible high score of 16.	+	10.30
PRICE	The price of the package of printer paper, in Canadian dollars that respondents were willing to pay for certified paper. Prices ranged from $5.00 to $7.00 at a $0.50 interval.	-	N/A

SMALL was included to assess whether an individual made small purchases of printer paper in a year. Specifically, respondents indicate whether they purchase less than one 500-sheet package of printer paper per year. Previous literature has suggested that more

infrequently purchased, small items may lead to a higher willingness to pay premiums (Teisl et al. 2002). Therefore, the expected sign for this variable was positive. NEWSPAPER and FURNITURE indicate whether or not a respondent sometimes considered the environmental impact of their purchases when buying newspaper and furniture. The expected sign for these two variables was positive.

ECOCENTRIC was a variable created from the questions in the Forest Value Scale (McFarlane and Boxall 2000) as described above. This variable was included to see if preferences for purchase of certified paper were related to individuals' ecocentric attitudinal orientation. This variable was expected to have a positive coefficient sign since those individuals with stronger ecocentric views would be expected to be more inclined to choose certified printer paper.

PRICE was the price of the certified paper alternatives used in the choice experiment scenarios and ranged from $5.00 to $7.00 at $0.50 intervals for the certified papers, but was held constant at $5.00/package for the non-certified option. It was assumed that the price parameter will have a negative sign.

3.3.6 Willingness to Pay

It is possible to develop estimates of the willingness to pay premiums from stated preference data. Haab and McConnell (2002) show methods for developing these estimates using a linear utility function in a RUM framework. Effectively, the authors

equated two different utility levels using a WTP procedure. For illustrative purposes, a form of Equation 3-7 is used as follows:

Equation 3-10

$$\alpha_{CSA}^{0} CSA + \alpha_{FSC}^{0} FSC + \beta PRICE = \alpha_{CSA}^{1} CSA + \alpha_{FSC}^{1} FSC + \beta PRICE$$

This formula equates the utility of a person in state 0 (i.e. with certified paper) to their utility in state 1 (i.e. without certified paper). Manipulating equation 3-10 yields the following result:

Equation 3-11

$$WTP = \frac{V_0 - V_1}{\beta}$$

Inputting equation 3-10, and solving, for example, CSA results in the following:

Equation 3-12

$$WTP = \frac{-\alpha CSA}{\beta}$$

The WTP measure for the conditional logit model is relatively straightforward as there were no individual specific characteristics included in the model. However, the variance of the welfare measure was developed using the procedures employed by Krinsky and Robb (1986). The matrix function in the LIMDEP software environment was used to employ this procedure using 5000 draws of the covariance matrix of parameters. For the RPL, a similar procedure was employed, but since individual specific characteristics were included in the mean shifts, the average of the characteristic values for the sample were employed. The mean and standard deviation of the vector of the resulting 5000 WTP estimates were developed and reported below.

3.4 Results

3.4.1 Sample Characteristics versus the General Albertan Population

In total, there were 206 respondents to this survey. While the median age of the province of Alberta was 36 years, the median age of sample respondents was 45. The median number of dependent children per household in this sample is 0. The provincial median shows that there is one child per household.

It was found that approximately 62 % of provincial households earn more than $50,000 per year. Nearly 77 % of the sample households, however, had income greater than $50,000 per year. Further, the sample and the target population differ in gender composition. While the province is almost evenly split between male and female (50.049% and 49.951% respectively), the sample composition is more female and than male (58.74% and 41.26% respectively).

The education level of sample respondents was substantially higher than the population of the province as a whole, with a much greater incidence of college/technical and above than the provincial averages (see Figure 3-4). Nearly 90% of the sample respondents had completed a college/technical diploma or a university degree, while approximately 50% of the general Alberta population had achieved this level of education. Further, while nearly 25% of the Alberta population did not hold a high school diploma, only about 2% of the sample fell into this category.

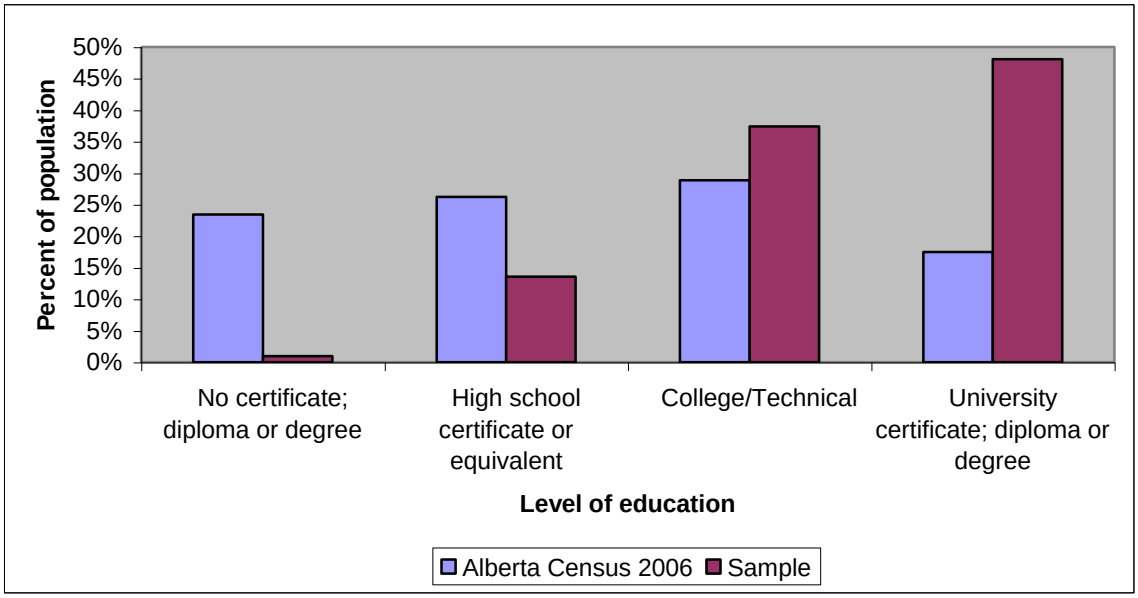

Figure 3-4: Percentages of Albertans and sample respondents who have completed specific levels of education.

Overall, this sample appears to not be representative of the provincial population of Alberta, according to the 2006 census. Most notably, this sample is predominantly older, has fewer children, has a higher income, is more female, and is better educated than the provincial population. Therefore, generalization of these results beyond the sample must be made with a considerable amount of caution.

3.4.2 Knowledge of Forest Certification

In the literature review, it was indicated that a consumer's knowledge of certification could affect the price premium for certified forest products. As a person becomes more knowledgeable about the certification system and its standards, they will be better able to form preferences for the knowledge that a forest is certified. In this sample, only 8.7% of individuals had heard of forest certification prior to taking the survey. Although this percentage is relatively low, the lack of knowledge is substantiated by previous research

in western Canada about a relative lack of knowledge about forest certification (Kozak et al 2004). This result would imply that the majority of respondents in this analysis were ultimately obtaining their knowledge about the CSA and FSC certification systems via the information present in the survey (please see Appendix 2 for further information).

3.4.3 Preferences for CSA and FSC Certified Printer Paper and the Factors Influencing the Certification Choice: The RUM and RPL Models

Table 3-3 shows the parameter estimates of the two choice models developed above. Based on the value of the log-likelihood function at convergence, the conditional logit model has explanatory power. However, the adjusted R^2 value is relatively low. A low adjusted R^2 value is to be expected given the simplicity of this model. The ASCs (CSA and FSC) are both positive and highly significant, indicating that respondents strongly prefer both types of certified over non-certified printer paper. Further, the two coefficient values are very similar, indicating that the sample of respondents preferred the two systems to a similar degree. The PRICE parameter, as expected, is negative and significant, implying that as the price of paper rises, all else being equal, respondents will be less likely to purchase printer paper.

Table 3-3[b]: Parameter estimates for two choice model specifications indicating the effect of different variables on the choice of computer printer paper packages.

Variables	Parameter (standard error)		
	Conditional logit model	Random parameters logit model	
		CSA	FSC
CSA(α_{CSA})	2.115*** (0.104)		
FSC(α_{FSC})	2.162*** (0.132)		
CSA (γ^1_{CSA})		2.553*** (0.718)	
FSC (γ^1_{FSC})			0.130 (0.818)
EDUC (γ^2)		-1.482** (0.598)	-0.477 (0.660)
ENV PURCH (γ^3)		1.392*** (0.426)	1.473*** (0.463)
SMALL (γ^4)		0.267 (0.395)	1.069** (0.448)
NEWSPAPER (γ^5)		0.773* (0.430)	0.549 (0.484)
FURNITURE (γ^6)		1.101** (0.474)	1.253** (0.542)
ECOCENTRIC (γ^7)		0.117*** (0.042)	0.222*** (0.049)
ST DEV		2.052*** (0.213)	2.587*** (0.250)
PRICE (β)	-1.273*** (0.077)	-1.935*** (0.118)	
Log-likelihood at convergence	-1297.514	-1064.657	
Adjusted R^2	0.087	0.247	

[b] Statistical significance indicated by asterisks (P<0.10 = *, P<0.05 = **, P<0.01 = ***).

The log-likelihood value at convergence for the RPL model also shows that the model has a significant level of explanatory power. The adjusted-R^2 values are higher than for the conditional logit model, which would indicate that the RPL explains more variation in

choice. However, this finding is to be expected given the considerably larger number of variables in the RPL model. The coefficient for PRICE was found to be significant and negative, as expected.

The coefficients on the standard deviation of the ASC for both CSA and FSC are large, positive and statistically significant indicating that there is significant heterogeneity in preferences for both types of certified paper. After accounting for the individual specific effects on preferences for CSA paper, the remaining component of the mean parameter for the CSA choice (γ^1_{CSA}) remains large, positive and significant. This indicates that the mean shifts, despite some being statistically significant, are not explaining the preferences for CSA paper. For example, the parameter on EDUC is large, negative and significant, while the parameters on ENV PURCH, NEWSPAPER, FURNITURE, and ECOCENTRIC are positive and significant. The magnitudes of these two opposite effects are similar, hence they have potential to cancel each other out leaving the large positive remainder exhibited in γ^1_{CSA}.

However, the results for the FSC mean shift are different. The remaining component of the mean parameter for the FSC choice (γ^1_{FSC}) is small, positive, but statistically insignificant. This insignificance indicates that the mean shifts are accounting for the majority of variation in the respondents' choice of FSC certified paper.

For CSA, the variable EDUC was significant and negative and the coefficient value was relatively large, implying that individuals with a post-secondary level education are less likely to choose CSA certified printer paper. For FSC, EDUC was insignificant.

Whether or not an individual considers their environmental impact when making purchasing decisions (ENV PURCH) was significant, positive and relatively large for both FSC and CSA paper choices. The size of the coefficient was similar for both CSA and FSC parameters.

For the choice of CSA, the variable SMALL, which denotes purchases of less than one 500-sheet package of printer paper per year, was positive but insignificant. For the choice of FSC, this variable was positive and significant. Individuals who purchase relatively small amounts of printer paper per year appear more likely to choose FSC certified printer paper than CSA certified printer paper. This finding corresponds to prior research that individuals who purchase smaller amounts of relatively low cost goods will be more likely to choose the certified option over the non-certified option.

Whether an individual sometimes considers their environmental impact when purchasing newspapers (NEWSPAPER) was found to be significant and positive for the choice of CSA, but insignificant for the choice of FSC. A related variable was whether or not an individual sometimes considers their environmental impact when purchasing furniture (FURNITURE). This variable was found to be significant and positive for both the choice of CSA and FSC, and the coefficient values were similar in size.

Finally, an attempt to measure the strength of respondents' environmental attitudinal orientation was made using the variable ECOCENTRIC. ECOCENTRIC was found to be significant and positive for both the choice of CSA and FSC. It is important to note that the value of ECOCENTRIC for FSC is about double the size of the same variable for CSA. It would appear that an individual's environmental beliefs have a stronger impact on their choice of FSC certified paper than for the CSA paper.

3.4.4 Willingness to Pay for CSA and FSC Certified Paper

It is apparent in Table 3-4 that individuals in this analysis state that they are willing to pay relatively significant price premiums for the knowledge that they are receiving certified printer paper. The model results indicate a price premium range of between 33% and 41% of the base price for printer paper. These price premiums are approximately double the size shown in Ozanne and Vlosky (1997) for similarly priced goods. However, it corresponds to the findings of Teisl (2003) that indicate consumers have the highest WTP for commonly used goods such as paper.

Table 3-4[c]: Calculated WTP values for CSA and FSC certified paper. The RPL value was the average WTP calculated from individual respondents' characteristics.

[c] It is important to note that in both models, the CSA and FSC WTPs are insignificantly different from one another. Significance was tested using a 95% confidence interval. The 95% confidence intervals for both the RUM and RPL overlapped.

	Estimated WTP for a Package of Computer Paper			
	CSA Certified Paper		FSC Certified Paper	
	Conditional Logit Model	Random Parameters Logit Model	Conditional Logit Model	Random Parameters Logit Model
Mean	1.66	2.05	1.70	1.99
Standard Deviation	0.081	0.130	0.073	0.126

The difference between FSC and CSA certified printer paper in both of the models is insignificant. These findings, combined with the findings presented in Table 3-3, indicate that although respondents are choosing FSC and CSA certified paper for different reasons, the final WTP is approximately the same between them. This further adds to the research that has intimated that FSC and other forms of certification may actually be complementary, rather than substitutes for one another.

3.5 Conclusion

This study found that knowledge of forest certification was relatively low. Only 8.7% of the sample had heard of forest certification before undertaking this questionnaire. This finding has implications for the effectiveness of certification in moving forest management in a more sustainable direction. If individual consumers are not aware of what certification is then it is unlikely that the appropriate signals will be sent to forest product companies regarding management.

This study found that individuals do indeed show a marked preference for certified printer paper over non-certified printer paper once they are informed about what certified paper is. However, the similarity between coefficients for CSA and FSC certified printer paper in the conditional logit model imply that, ultimately, either certification system is as likely to be preferred as the other. Therefore, an RPL model was used to analyze some the individual specific characteristics that might be driving a respondent's preferences for certification.

The significance of the choice variable for CSA (γ^1_{csa}) indicates that aspects of an individual's choice are not being modelled in the RPL that lead to the choice of CSA certified printer paper. One possible hypothesis would be that respondents are displaying a form of certification nationalism, choosing the CSA certified printer paper because it is the local, familiar label. However, this hypothesis has not been tested and should be examined further. The choice variable for FSC (γ^1_{fsc}) in the RPL was statistically

insignificant indicating that the individual specific variables in this model were accounting for the majority of variation in preferences for FSC certified printer paper.

The findings in this study indicate that the underlying reasons for choosing CSA or FSC certified printer paper differ. Individuals with a post-secondary level of education appear less likely to choose CSA certified printer paper. Further, those individuals who purchase less than one package of printer paper per year are more likely to choose FSC certified paper. Finally, higher individual ecocentric attitudinal orientation towards forests increases the likelihood of choosing both CSA and FSC certified printer paper, but the effect appears stronger for FSC than for CSA.

Given these findings, this study investigated whether there was a willingness to pay a price premium for CSA and/or FSC certified printer paper. The price premium was large but insignificantly different between CSA and FSC certified printer paper. Ultimately, these findings appear to indicate that the CSA and FSC certification systems are being chosen for different reasons, and would appear to be complements rather than substitutes.

It is important to note the limitations of this study. First is that these values are derived from stated preference methods. It has been shown in previous literature (see Gleason and de Alba 1996, Bishop and Heberlein 1979) that there may be a difference between what people state they are willing to pay for a product and what they will actually pay for it. Gleason and de Alba (1996) showed that 70% of respondents to a stated preference survey indicated that they were willing to pay a price premium for “green” electricity.

However, when these survey respondents were actually offered the “green” electricity option, only 5% were willing to pay a price premium.

Secondly, respondents indicated a lack of knowledge about forest certification prior to taking this survey. Therefore, it is likely that the information provided about the CSA and FSC systems may have had a strong influence on the formulation of preferences and, ultimately, WTP. Finally, recall that there were substantial differences between the sample and the general population. Such differences necessitate caution when attempting to make generalizations about Alberta from these results.

3.6 References

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4 Conclusion

Sustainable Forest Management is the art of attempting to balance economic, social and ecological aspects of forests. To quote Golec and Luckert (2008), "…SFM implies diversity." The knowledge to maintain the ecological aspects is incomplete, tools to determine the social needs of forests are still relatively new, and the triumvirate of objectives are, at times, at odds with one another (Adamowicz and Veeman 1998). It is an exercise in optimization that is dynamic and coloured by the complexity of social and ecological systems. Part of the complexity comes from identifying public preferences.

Chapter 2 examined community preferences of forest tenure characteristics toward SFM objectives. The results indicate that, while communities remain content with the current structure, there remains room for improvement. Objectives such as environmental integrity and community stability appear to have been better met than competitiveness by the current structure of tenures. Consequently, it would appear that communities have the strongest opinions regarding the influence of forest tenure in influencing the competitiveness of forest businesses. The results indicate that there are considerable differences between eastern and western Canada over what is, and what is not, important with respect to forest tenure characteristics. For the objectives of competitiveness and environmental integrity, eastern and western respondents held very different viewpoints on what was important to maintaining/enhancing the objective. For competitiveness, eastern respondents saw duration as among the most important characteristics, while western respondents saw duration as among the least important characteristics. For

environmental integrity, eastern respondents saw the requirement to operate a wood processing facility as more important than duration, while western respondents saw the requirement to operate a wood processing facility as less important than duration. For community stability, western respondents saw flexibility in harvest levels as more important than duration and wood processing requirements as less important than duration. Further, eastern and western respondents indicate that non-timber benefits that are of use to the community would be unacceptable to add to tenure.

Chapter 3 investigated the choice of CSA and FSC certified printer paper. Previous research found evidence that the depth of awareness of forest certification in western Canada was low (Kozak et al 2004), and this study indicates that awareness remains low in Alberta. As has been stated previously, an individual's awareness of certification will influence their willingness to pay. Therefore, since the respondents did not have a great deal of prior knowledge of forest certification, their willingness to pay for CSA and FSC was likely influenced by the information provided in this study.

This study does indicate that there is a strong preference for certified printer paper, the differences in price premia between CSA and FSC certified paper was statistically insignificant. However, this study does indicate that the choice of CSA and FSC certified printer paper is affected by different characteristics and should therefore be more appropriately treated as complementary forest certification systems rather than substitutes for one another.

Taken together these studies indicate some key items for consideration regarding the role of forest institutions in leading toward SFM. Currently, forest tenures are constructed at a sub-national level, with negotiations leading to localized tenure agreements. This research would indicate that this approach is correct, and that provincial governments should continue to maintain this approach to account for differences between regions.

Certification may also have a role to play in moving Canadian forests closer toward SFM. However, consumer awareness about forest certification must be increased for certification to provide effective signals to producers. Further, just as with tenure, it would appear that there is a diversity of opinion that would not be met with a single certification system. Therefore, the findings in this study indicate there is likely no single, unifying certification system. Rather, several certification systems would likely be needed to suit the current state of preferences in Alberta.

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Appendix A Community preferences of tenure characteristics survey example

(Delivered via mail-in and online survey work)

Section 1

In this section, we focus on several conditions of forest tenures that will be referred to as tenure characteristics. These are:

- **Duration of the tenure**: The length (in years) of the tenure agreement between the company and the provincial government.

- **Stumpage fees**: The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.

- **Flexibility in following operational requirements**: The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).

- **Flexibility of timber harvest levels**: The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).

- **Wood processing requirements**: Requirements that a timber company process into value-added products some proportion of the timber that it harvests.

Each of these tenure characteristics has the potential to influence how well forestry operations meet or align with the various benefits that Canadians desire from their forests. In the questions that follow, we ask for your thoughts on how these tenure characteristics may, or may not, be important in influencing the following social objectives from forests: competitiveness, promoting or maintaining the environmental integrity of forests, and promoting or maintaining community stability.

Competitiveness

Competitiveness refers to the ability of Canadian forest companies to compete in global markets. Increased competitiveness would lead to an expanding forestry sector, thereby leading to more jobs and/or capital investments.

Below are profiles made up of various combinations of tenure characteristics. Please think of tenure agreements in terms of their implications for the competitiveness of the forest industry. Then, choose **one Most important and one Least important** characteristic for maintaining or enhancing competitiveness.

Question 1a: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing competitiveness, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic	Tenure Characteristics	**Least important** characteristic

(Please check only one)		(Please check only one)
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐

Question 1b: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing competitiveness, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐
☐	The length (in years) of the tenure agreement between the company and the provincial government.	☐
☐	The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).	☐

Question 1c: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing competitiveness, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).	☐
☐	The length (in years) of the tenure agreement between the company and the provincial government.	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐

Environmental integrity of forests:

Environmental integrity of forests is a broad concept that includes multiple factors associated with forest resources. Maintaining and/or increasing environmental integrity would support enhanced biodiversity, wildlife populations, and forest recreation. Moreover, increasing integrity of the forest environment may help sustain the benefits associated with harvesting non-timber forest products (e.g. berries, mushrooms, etc.).

Now, please think of tenure agreements in terms of environmental integrity of forests. Choose **one Most important and one Least important** characteristic that can maintain or enhance environmental integrity of forests.

Question 2a: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or

enhancing environmental integrity of forests, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The length (in years) of the tenure agreement between the company and the provincial government.	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐

Question 2b: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing environmental integrity of forests, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).	☐
☐	The length (in years) of the tenure agreement between the company and the provincial government.	☐

Question 2c: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing environmental integrity of forests, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	Requirements that a timber company process some proportion of the timber that it harvests into forest products.	☐

Community stability

Promoting or maintaining community stability means that communities are vibrant places that maintain current residents and attract newcomers. Such communities are sufficiently robust that they are able to weather economic downturns and continue to prosper. Continuous and long-term jobs and income stay within the local economy.

Please think of tenure agreements in terms of community stability. Choose **one Most important and one Least important** characteristic for maintaining or enhancing community stability.

Question 3a: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing community stability, and which one is the **least important** characteristic? (Please check one

answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐

Question 3b: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing community stability, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐
☐	The flexibility which forest companies are allowed in following operational requirements (for example, reforestation requirements, forest operation regulations, etc.).	☐
☐	The length (in years) of the tenure agreement between the company and the provincial government.	☐

Question 3c: Which tenure characteristic in the list below is the **most important** characteristic for maintaining or enhancing community stability, and which one is the **least important** characteristic? (Please check one answer in **each** column)

Most important characteristic (Please check only one)	Tenure Characteristics	**Least important** characteristic (Please check only one)
☐	The flexibility that a forest company has to deviate from the forecasted harvest levels (i.e. the annual allowable cut).	☐
☐	Requirements that a timber company process into forest products some proportion of the timber that it harvests.	☐
☐	The amount of fees that the tenure holder (i.e. forest company) is required to pay to the provincial government for harvesting timber.	☐

Section 2

In this section we will ask you about your perceptions of the agreements between the Provincial Government and forestry companies operating in your region. Please answer the following questions with respect to agreements between the Provincial government and the forest industry, and the effects of these agreements on your community.

What province do you live and work in?

☐ **Alberta** – Please answer the following questions with respect to the **Forest Management Agreement (FMA)** form of tenure in Alberta.

☐ **British Columbia** – Please answer the following questions with respect to the **Tree Farm Licence (TFL)** (circle appropriate answers) and the **Forest Licence (FL)** (put a box around appropriate answers) forms of

tenure in British Columbia.

☐ **Manitoba** – Please answer the following questions with respect to the **Forest Management Licence Agreement (FML)** form of tenure in Manitoba.

☐ **New Brunswick** - Please answer the following questions with respect to the **Crown Timber Licence (CTL)** form of tenure in New Brunswick.

☐ **Newfoundland and Labrador** - Please answer the following questions with respect to the **Long Term Timber Licence (LTTL)** form of tenure in Newfoundland and Labrador.

☐ **Nova Scotia** - Please answer the following questions with respect to the **Long-Term Licence and Management Agreement (LMA)** form of tenure in Nova Scotia.

☐ **Ontario** - Please answer the following questions with respect to the **Sustainable Forest Licence (SFL)** form of tenure in Ontario.

☐ **Québec** - Please answer the following questions with respect to the **Contrat d'approvisionnement et d'aménagement forestier (CAAF)** form of tenure in Québec.

☐ **Saskatchewan** – Please answer the following questions with respect to the **Forest Management Agreement (FMA)** form of tenure in Saskatchewan.

Please answer the following questions with respect to the general effects of this type of tenure:

		Strongly promotes	Somewhat promotes	Neutral	Somewhat discourages	Strongly discourages
2.1	These agreements have the following impact on incentives to promote innovative practices within the province's forest industry.	1	2	3	4	5
2.2	These agreements have the following impact on the competitiveness of the province's forest industry in the global market.	1	2	3	4	5
2.3	These agreements have the following impact on the environmental sustainability of the province's forests.	1	2	3	4	5

2.4	These agreements have the following impact on the stability of forest dependent communities in the province.	1	2	3	4	5

Please answer the following questions with respect to the acceptability of various changes to this type of tenure:

		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
2.5	Increasing the duration of these agreements would be acceptable to my community.	1	2	3	4	5
2.6	Decreasing the duration of these agreements would be acceptable to my community.	1	2	3	4	5

2.7	Increasing stumpage fees paid by the forest industry under these agreements would be acceptable to my community.	1	2	3	4	5
2.8	Decreasing stumpage fees paid by the forest industry under these agreements would be acceptable to my community.	1	2	3	4	5

Please answer the following questions with respect to the acceptability of various changes to this type of tenure:

If you live in British Columbia, Saskatchewan or Ontario, please answer Question 2.9b and then proceed to 2.10. If you live in any other province, please answer Question 2.9a and then proceed to 2.10

		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
2.9a	Removing the requirement that the holders of these agreements own and operate timber processing facilities would be acceptable to my community.	1	2	3	4	5
2.9b	Adding the requirement that the holders of these agreements own and operate timber processing facilities would be acceptable to my community.	1	2	3	4	5

		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree

2.10	Broadening these agreements to include rights for the companies to obtain benefits from forest recreation would be acceptable to my community.	1	2	3	4	5
2.11	Broadening these agreements to include rights for the companies to obtain benefits from non-timber forest products such as mushrooms and berries would be acceptable to my community.	1	2	3	4	5
2.12	Broadening these agreements to include rights to receive carbon credits from forest management would be acceptable to my community.	1	2	3	4	5
2.13	Making operational requirements more prescribed for the holders of these agreements, such that the companies would have less flexibility and discretion in how they pursue forestry objectives, would be acceptable to my community.	1	2	3	4	5

Please answer the following questions with respect to the acceptability of various changes to this type of tenure:

		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
2.14	Making operational requirements less prescribed for the holders of these agreements, such that the companies would have more flexibility and discretion in how they pursue forestry objectives, would be acceptable to my community.	1	2	3	4	5
2.15	Increasing the amount of flexibility of harvest levels allowed around the forecasted annual allowable cuts (AAC) as part of these agreements would be acceptable to my community.	1	2	3	4	5
2.16	Decreasing the amount of flexibility of harvest levels allowed around the forecasted annual allowable cuts	1	2	3	4	5

	(AAC) as part of these agreements would be acceptable to my community.

Appendix B Individual preferences of certified printer paper survey example

(Distributed as an online survey)

Forest Certification

Thank you for taking the time to complete this online questionnaire. Please try to answer all of the questions. Most questions can be answered by clicking on the button next to the question. Feel free not to answer any question that you are uncomfortable with. This questionnaire should take between 10-15 minutes. If, at any time, you wish to leave the survey, please close your browser.

Part 1: Consumption Habits

1) Do You Recycle? ___ Yes ___ No

2) What Do You Recycle? ___ Just Paper ___ Just Bottles

___ Bottles and Paper ___Everything Possible

3) Have you ever heard of Forest certification? ___Yes ___ No

4) How many times per year do you participate in forest related activities? (E.g. Hiking, camping, canoeing/kayaking, skiing/snowboarding, fishing, bird-watching)

1-10	11-20	21-30	Greater than 30	Never

5) To what extent do you consider environmental issues in your purchase decisions for the following products:

	Never	**Rarely**	**Sometimes**	**All The Time**
Newspapers and magazines				
Furniture				
Building products (lumber, cabinets, flooring)				
Household paper products (toilet paper, paper towel)				

6) Please rate the extent to which you agree or disagree with the following statements:

	Strongly Disagree	**Disagree**	**Neutral (Neither agree nor disagree)**	**Agree**	**Strongly agree**

I always think of the environmental consequences of my consumption decisions.					
I always think of the impact of my consumption decisions on other people.					
I always put my own needs first in my consumption decisions.					

7)Do you look for labels on packaging indicating environmental friendliness?

___ Yes ___ No

9)Do you seek out products from companies that are environmentally conscious?

___ Yes ___ No

Part 2: Forest Values Scale

We would now like to obtain your views on the relationship between people and the forest. This will help us understand people's preferences regarding policy and management. Please rate the extent to which you agree or disagree with each statement.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	No opinion
Whether or not I get to visit the forest as much as I like, it is important for me to know that forests exist in my province	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests should be managed to meet as many human needs as possible	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests should have the right to exist for their own sake, regardless of human concerns and uses	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests give us a sense of peace and well being	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests should exist	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6

mainly to serve human needs						
Forests are sacred places	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
It is important to maintain the forests for future generations	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests should be left to grow, develop and succumb to natural forces without being managed by humans	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests that are not used for the benefit of humans are a waste of our natural resources	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests let us feel close to nature	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
If forests are not threatened by human actions, we should use them to add to the quality of human life	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests rejuvenate the human spirit	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
Forests can be improved through management by humans	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6

Wildlife, plants, and humans should have equal rights to live and develop	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6
The primary function of forests should be for products and services that are useful to humans	❑ 1	❑ 2	❑ 3	❑ 4	❑ 5	❑ 6

1) Do you use Printer Paper? ___ Yes ___ No

2)Approximately how many 500 sheet paper packages do you purchase per year for your household (i.e. non-business)?

Less than 1	1-2	2-3	3-4	Greater than 4

We would appreciate it if you would read the following information on two specific forest certification schemes, namely the Forest Stewardship Council and the Canadian Standards Association. Thank you.

History

Forest certification emerged in the late 1980s in response to concerns about forest management practices, calls for boycotts of certain wood products, and disillusionment with the failure to improve forest management through regulatory or 'command and control' mechanisms. The 1992 United Nations Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro brought to light the need for concrete action on the issue of forest conservation. Forest certification evolved as a potential instrument through which sustainable forest management (SFM) could be promoted throughout the world. SFM is a concept specifically designed to incorporate different interests and values of forests to include the maintenance of ecosystem services (e.g. biodiversity, watershed protection) and social interest, with the extraction of timber and non-timber forest products.

The following section describes two common types of forest certification upon which this survey is based.

The Forest Stewardship Council (FSC) Certification in an international, membership based, non – profit organization that supports environmentally appropriate, socially beneficial, and economically viable management of the worlds forests.

The Canadian Standards Association (CSA) is also an international organization that is a provider of product testing and certification services. They published a Canadian standard for sustainable forest management (SFM). The standard requires a comprehensive SFM plan and on the ground performance standards.

Below is a table comparing the two different certification schemes.

	FSC	CSA
Establishment	in 1993	in 1996
Membership (includes forest and non-forest companies)	Membership based, with more than 550 members from 67 countries	Membership based, with approximately 30 forestry based members
Required or Voluntary	Voluntary	Voluntary
Forest Certification scheme influenced or created by	Environmental Non-governmental Organizations (ENGO), Timber Industry, Forestry Profession, Aboriginal Organizations, & Community forestry groups	Representatives from ENGO's, Government, Industry, Academic, and Consultant Organizations
Standards	Performance and Process based standards	Performance based standards
Supported by	ENGO's	Canadian Government & Forest Industry
Level of Canadian Certification (million Hectares) as of 2006	26.8 million hectares	71.7 million hectares

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In the following questions, we are asking you to choose on your next paper purchase between a standard 500 sheet package of non-certified paper, which is sold for $5.00/package, with packages of paper certified under the CSA and FSC certification schemes at various prices. Please consider each question without comparing options on different screens.

Part 3: Choice Experiment

1. On your next purchase of a 500 sheet package of computer paper, if the following options were the only ones available, which one would you choose?

Option A	Option B	Option C
Non-certified	CSA 	CSA 
$5.00 per package	$5.00 per package	$6.50 per package

2. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	FSC 	FSC 
$5.00 per package	$5.00 per package	$6.00 per package

3. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	CSA 	FSC 
$5.00 per package	$5.00 per package	$5.00 per package

4. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	CSA 	FSC 
$5.00 per package	$5.50 per package	$5.50 per package

5. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	CSA	FSC
$5.00 per package	$6.00 per package	$6.50 per package

6. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	FSC	CSA
$5.00 per package	$6.50 per package	$5.00 per package

7. Now consider if these were the only paper choices available, which option would you purchase? Please remember to consider this set of choices without comparing options on previous screens?

Option A	Option B	Option C
Non-certified	FSC	CSA
$5.00 per package	$6.00 per package	$6.00 per package

Part 4: Some Questions About You

The following questions are designed to tell us a little about you. This information will only be used to report comparisons among groups of people and you will not be identified in any way. Your name will never appear with your answers, as we will not know who completes this questionnaire after it is collected. However, if for some reason there is a question you do not wish to answer, just leave it blank.

10. I am: ____ Female ____ Male

11. I am _____ years old

12. I have ____ children under the age of 18 residing in my household

13. Which category best describes your annual household income? (Before taxes)

____ Less than $25,000

____ $25,001-$50,000

____ $50,001 – $100,000

____ $ $100,001-$150,000

____Over $150,000

14. What is the highest level of education that you have completed?

____ Less than high school

____ High school

____ College/technical school

____ University

____ Post-university (graduate school)

15. Please provide the first 3 digits of your home Postal code: □ □ □

If you have any additional comments, please write in the dialog box on the page.

Thank you for completing this survey.

Appendix C Utility Balanced Choice Experiment

In Table C-1, examples of all the different combinations of certification system and price level were constructed. In the certification survey (see Appendix B) there were three choices offered to respondents, A, B and C. Option A was always the non-certified choice, with price held constant at $5.00. Option B and C varied between $5.00 and $7.00 and between CSA and FSC, at $0.50 intervals. Table C-1 was the first step at ensuring that combinations were balanced over all eight different versions of the choice experiment. Table C-1 was used to set up the total number of unique price and certification combinations.

Table C-1: The different price combinations between CSA and FSC certified printer paper. Price levels were 1 = $5.00, 2 = $5.50, 3 = $6.00, 4 = $6.50, and 5 = $7.00.

	Option B	Option C	Option B	Option C
	CSA	CSA	FSC	FSC
1	1	1		
2	1	2		
3	1	3		

4	1	4		
5	1	5		
6	2	2		
7	2	3		
8	2	4		
9	2	5		
10	3	3		
11	3	4		
12	4	4		
13	4	5		
14	5	5		
15			1	1
16			1	2
17			1	3
18			1	4
19			1	5
20			2	2
21			2	3
22			2	4
23			2	5
24			3	3
25			3	4
26			4	4
27			4	5
28			5	5
29	1			1
30	1			2
31	1			3
32	1			4
33	1			5
34	2			2

35	2			3
36	2			4
37	2			5
38	3			3
39	3			4
40	4			4
41	4			5
42	5			5
43		1	1	
44		1	2	
45		1	3	
46		1	4	
47		1	5	
48		2	2	
49		2	3	
50		2	4	
51		2	5	
52		3	3	
53		3	4	
54		4	4	
55		4	5	
56		5	5	

The second component was to balance the choice sets by “eye”, or visually analyze a graphical representation of the different combinations to ensure that no specific combination or set of combinations was being over-represented in any one version, shown in Table C-2. In the actual analysis, both Table C-1 and C-2 were side by side.

Table C-2: The table used to “utility balance, by eye” the different versions of the choice experiment. Each column represents a different choice experiment for the eight different versions of the survey.

V1	V2	V3	V4	V5	V6	V7	V8
	1						
		1					
			1				
1							
					1		
				1			
						1	
			1				
							1
					1		
		1					
						1	
				1			
	1						
					1		
							1
1							
			1				
				1			
	1						
		1					
						1	
					1		
				1			
		1