A PRELIMINARY EVALUATION OF THE RESULTS-BASED FOREST AND RANGE PRACTICES ACT: FOSTERING INNOVATION IN FOREST PRACTICES?

by

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ABSTRACT

In 2004 the British Columbia (BC) government introduced the Forest and Range Practices Act (FRPA) and described it as a 'results-based' approach to forest management. This research sought to evaluate the potential effectiveness of the FRPA regime in achieving one of its stated goals - '*to foster the development of innovative forest practices and provide professional freedom to manage in the delivery of defined results'* (BC, 2004). Research methods included a review of the first 65 Forest Stewardship Plans (FSP's) approved under FRPA to identify the potential for innovation indicated by practice commitments for three key environmental values – soils, biodiversity and riparian areas. A web survey and phone interviews with the prescribing foresters who developed these plans helped to build an understanding of the factors influencing their willingness to innovate under FRPA with respect to practices designed to manage for these three values.

This thesis describes how the FRPA framework is not purely performance-based, but is rather a complex mixture of regulatory approaches. It includes the application of a 'default practice' approach for most environmental values that licensees may choose to implement or to propose alternative practices for approval. Early FSP's indicated limited potential for innovation with only 10% of forest practice commitments reflecting approaches that were alternative to the default practices. These alternative forest practices are often better characterized as providing increased flexibility in the application of a default practice, rather than being truly new and innovative.

Key reasons for this response include a perception by prescribing foresters that the default forest practices are reasonably effective, leaving little incentive to identify alternatives, and the overriding importance of receiving approval for their first FSP's within the requisite timelines. The development of alternative forest practices was perceived as potentially time consuming and costly, and could put at risk the certainty of government approval for their FSP, and reasons for this perception are discussed. Further research to evaluate the actual degree of innovation reflected in practices on the ground, as well as the likelihood of increasing innovation in over time is recommended.

PREFACE

Approval for this research was obtained from the UBC Behavioural Research Ethics Board for Phase 1 (B06-0852) and Phase 2 (H07-021130) of the project.

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LIST OF ACRONYMS

BC	British Columbia
DDM	Delegated Decision Maker
DM	District Manager (Ministry of Forests and Range)
FPB	Forest Practices Board
FPC	Forest Practices Code
FPPR	Forest and Range Practices Regulation
FRPA	Forest and Range Practices Act
FSP	Forest Stewardship Plan
GAR	Government Actions Regulation
LRMP	Land and Resource Management Plan
MFR	Ministry of Forests and Range
SDM	Statutory Decision-Maker
WTP	Wildlife Tree Patch

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DEDICATION

To Freya, who was such a powerful presence in my life during the course of writing this thesis. Your integrity, kindness, love for learning and commitment to social justice will forever remain an inspiration for me.

CHAPTER 1: INTRODUCTION

1.1 Background and Context

The regulation of forest practices is a subject of keen interest to many British Columbians, who hold a wide range of values in the resources and services provides by forests – whether for economic, environmental, recreational, cultural or spiritual purposes. Over the past century public interests and policy goals for forest management have changed dramatically, and so has the Province's approach to the regulation of forest practices. There has been an evolution of regulatory approaches for the management of environmental values in forests, from an era of virtually no environmental regulation over the early part of the century, to voluntary forest practice guidelines in the 1970's and 80's, to comprehensive command and control legislation under the Forest Practices Code (the FPC) in the 1990's, and finally to the introduction of the current 'results-based' Forest and Range Practices Act (FRPA) regulatory framework in 2004.

Each successive regulatory approach has been developed in response to lessons learned in the implementation of its successor approach, as well as the political and economic context and forest policy goals of the government of the day. For example, the widely perceived failure of voluntary guidelines to effect any significant change in forest practices, coupled with considerable public pressure (and other factors discussed in Chapter 2) led to the implementation of the Forest Practices Code – characterized by some as 'the epitome of command and control legislation (Reader, 2006). The FPC by comparison, was widely credited for having significantly improved forest practices in BC (BC FPB, 2006) and creating a standard playing field for forest practices. However, it was also widely criticized for having been overly prescriptive, administratively burdensome and costly, and stifling to innovation (BC FPB, 2006; Vold, 2003). The FPC approach to legislating standard forest practice requirements, supplemented by detailed guidebooks has been described as 'cookbook forestry' (Reader, 2006), and criticized for providing little to no flexibility for the implementation of alternative and innovative practices. This context, along with a significant downturn in the forest sector economy amongst other factors, were fundamental to the development of the current Forest and Range Practices Act regulatory framework.

The FRPA framework is described as a results-based (or performance-based) approach to forest management, in which government specifies the desired outcomes for forest management and forest licensees are provided the flexibility and accountability for determining the practices that will be used to achieve them. Goals for the formulation of FRPA included a commitment to maintaining the same environmental standards as the FPC, and continuing to balance social, economic and environmental values (although with a greater emphasis on limiting impacts to the forest sector), but significantly emphasized a commitment to reduce transactional and operational costs to industry, and *to provide industry the freedom to manage in delivery of defined results and open the door to innovation in forest practices* (BC 2004b). When it was introduced, the BC Government contended that the FRPA framework offered a new way of doing business that encourages innovation and holds industry responsible for the outcomes, and that would achieve high-quality forest management as a result (BC MoF, 2004a).

Results or performance-based approaches to regulation – where a desired environmental outcome or standard is specified by the regulator, but the firm may choose how to achieve that level – are widely upheld in the literature for their ability to provide flexibility and foster innovative, cost-effective practices. While performance-based management systems are commonly applied in other environmental regulatory contexts (e.g. for the regulation of air or water pollutants) BC is one of the first jurisdictions to apply a performance-based approach to the regulation of forest practices. As such, there is significant interest in assessing the effectiveness of this system in achieving its stated goals, and desired outcomes for forest management.

After the FRPA legislation was established in 2004, a two year transition period ensued to provide forest licensees time to develop and seek approval for their Forest Stewardship Plans, as required under the new regime. The research for this project was initiated in March of 2007, with the aim of evaluating initial experience with the implementation of the results-based FRPA framework.

1.2 Research Objectives and Questions

The overarching objective for this research is to assess the potential effectiveness of the FRPA regulatory framework in achieving its stated goal of fostering the development of innovative forest practices and providing professional freedom to manage in the delivery of defined results. Innovative forest practices have been defined for the purpose of this project as '*new practices that are intended to provide a more cost-effective means of maintaining or improving identified forest values*'. This research focuses specifically on evaluating the potential for innovation in forest practices designed to manage for three key environmental values: 1) soils; 2) landscape and stand level biodiversity; and 3) riparian areas.

In support of this objective, this research seeks to address the following questions:

1. To what extent does the FRPA framework reflect a 'performance-based' regulatory approach and provide opportunities for innovation in forest practices?
2. To what extent are forest licensees taking advantage of the flexibility provided by the performance-based components of the FRPA framework, and developing alternative and innovative forest practices to manage for selected environmental values?
3. What are the factors that are influencing licensee response to the FRPA framework, and their willingness to innovate with respect to practices for maintaining environmental values?
4. Are the initial experiences in implementation of the Forest and Range Practices Act consistent with the propositions in theory that performance-based approaches to regulation should stimulate innovation and cost-effectiveness? Why or why not?

1.2.1 Hypotheses

The theoretical hypothesis is that implementation of a results-based system of forest regulation should result in a diversity of forest practices being proposed and implemented by forest licensees / professional foresters, to achieve defined environmental objectives. However, the results-based regulation will not be sufficient cause to influence all licensees to develop alternative forest practices. Additional factors related to costs, certification commitments, risk and liability, and values and perceptions of forest management will also influence a prescribing forester's response to the system.

The testable hypothesis is that at least some approved Forest Stewardship Plans should include alternative and potentially innovative forest practice commitments for the management of soils, biodiversity and riparian area values. Additionally, the following factors are hypothesized as having an influence on a prescribing forester's choice of default or alternative practices:

1) *Perceptions of the effectiveness of the Code / FRPA default practices in achieving environmental values*: foresters/licensees who perceive the Code/ FRPA default practices as being effective are less likely to develop alternative practices;
2) *Perceptions of the economic efficiency of the Code / FRPA default practices:* foresters/licensees who perceive the Code / default practices as being economically efficient are less likely to develop alternative practices.
3) *Access to financial resources*: foresters / licensees with access to greater financial resources are more likely to develop alternative practices.
4) *Perceptions of the cost of developing alternative practice*: foresters / licensees who perceive that the cost of developing alternative forest practices for approval is high are less likely to develop alternative forest practices.
5) *Perceptions of risk and legal liability*: foresters / licensees who perceive a high level of legal risk associated with the development of alternative practices, are less likely to develop alternative forest practices. An initial 'fear of the unknown' may also influence risk-averse behaviour in the early stages of FRPA implementation.
6) *Third-party certification commitments*: forest licensees who have committed to certification (i.e. Forest Stewardship Council or Canadian Standards Association) are more likely to develop alternative forest practices to meet certification commitments.

1.3 Research Methods

1.3.1 Research Design

The design of this project reflects both the evaluative and exploratory nature of the research. Evaluation research has been simply defined as "the process of determining whether a social intervention has produced the intended result'" (Babbie, 2004, 343). In the case of this research, the objective is to carry out a *preliminary* evaluation of whether the FRPA framework *is expected to achieve* one of its intended results – to foster innovative practices and support

professional freedom to manage. Because this research was carried out early in the implementation of the FRPA framework, before there were many forest practices implemented on the ground pursuant to this regime, it was not possible to complete an evaluation of actual on-the-ground results. However, it was determined possible and potentially useful to evaluate indicators of the potential for forest practices innovation, as described in early Forest Stewardship Plans and expressed by the professional foresters responsible for preparing those plans (the prescribing foresters).

The approach for this project included the following: an evaluation of the performance-based nature of the FRPA framework and the opportunities it provides for innovation was first undertaken; an evaluation of the potential for innovation indicated by forest practice commitments stated in a cross-section of Forest Stewardship Plans and expressed by prescribing foresters; and, an exploration of the factors influencing the extent of potential for innovation identified in FSP's. A variety of methods were used to collect information relevant to addressing each of the stated research questions, including document review, implementation of a web-based survey, and semi-structured phone interviews, as outlined in Table 1 below.

TABLE 1: SUMMARY OF RESEARCH QUESTIONS, INDICATORS, AND DATA COLLECTION METHOD

Research Question	Indicators	Method
a) To what extent does FRPA reflect a 'performance-based' approach to management	Consistency with theoretical characteristics of performance-based regulation	Document Review
b) To what extent are licensees implementing alternative practices for the management of soils, riparian areas and biodiversity values?	# of alternative practices identified in sample FSP's for defined values	Document Review Web-based Survey
c) To what extent are specified alternative forest practices considered to be 'innovative'	Perceptions of the degree of innovation in alternative practices	Document Review Web-based Survey Phone Interviews
d) What are the key factors influencing licensee response to the FRP framework, and willingness to innovate?	Perceptions of the significance of hypothesized factors, as outlined in section 1.2.1.	Web-based Survey Phone Interviews

This research for this project was carried out in two distinct phases. The first phase of research and analysis was carried out between January and July of 2007 – and consisted primarily of document review, and the design, implementation and analysis of a web-based survey. The goal for this first phase was to build a broad understanding of licensee response to the FRPA framework and initial indications of the potential for innovation in forest practices. The second phase of research was carried out between May and September of 2008, and focused on a more detailed analysis of four case studies - through document review and semi-structured phone interviews. The main purpose of this second phase of research was to enable more in-depth exploration of key questions that arose during Phase One, to build an understanding of the perspectives of statutory decision-makers as well as prescribing foresters, and to validate conclusions that were drawn from Phase One. More detailed methods used in each phase of the project are outlined in the sections that follow.

1.3.2 Phase One Research Methods

Sample Selection

The population of interest to this research consisted of all Forest Stewardship Plans initially approved under the FRPA framework. As of March 15, 2007, there were 65 FSP's approved, out of a total of roughly 200 that were expected to be submitted for approval over the following months. These 65 FSP's provided a sufficient cross-sectional sample of FSP's to support the extrapolation of research results to the broader population of FSP's, while still being a feasible size to allow for the direct review of all plans.

However, in a desire to enable a balance between a desired quality and depth of assessment and overall project feasibility, it was decided that the research would be focused on assessment of forest practices for a subset of the 11 FRPA values, rather than attempting a more superficial review of all practices. Due to the author's specific interests in practices for the management of environmental values – three primary environmental values were selected as the focus of the research: soils, biodiversity (landscape and stand level) and riparian areas (which includes practices for water and habitat within riparian areas). As a result, conclusions that are drawn from this research with respect to the effectiveness of the FRPA regime are constrained to its

effectiveness in the management of these three values, and cannot be extrapolated to its effectiveness in managing for all 11 values.

Document Review

All 65 sample FSP's were reviewed in detail, along with the Background Documents that typically accompanied them to provide further descriptive information and a rationale to support alternative forest practices (if there were any). For each FSP, the stated forest practice commitments for soils, biodiversity and riparian areas were documented in an excel spreadsheet. Alternative practices were summarized, along with any rationale to support their approval.

Web-Based Survey

A web-based survey was developed and implemented for the purpose of building an understanding of the factors that influenced prescribing foresters in their choice of forest practices. Once the survey content was approved by the UBC Ethics Board, the survey was created using Survey Monkey web-based software, and an invitation to participate sent to the prescribing foresters who signed accountability for the 65 sample FSP's. Invitations were first sent by mail, with follow-up contact by email a couple of weeks later, and if necessary, a third and final email to invite participation.

The survey (see Appendix One) first asked respondents to confirm their selection of default or alternative practices. Where they noted alternative practices, respondents were asked to rate how innovative they perceived those practices to be on a scale of 1 (not innovative) to 5 (very innovative). They were then asked to identify the key factors influencing their choice of forest practices through both closed and open ended questions. Finally they were asked to respond to a number of questions that sought to characterize their perceptions (on a likert scale of 1 to 5) related to a number of factors hypothesized to have influenced their choice of forest practices, such as:

- perceptions of the effectiveness and efficiency of the former Forest Practices Code / the FRPA default practices;
- perceptions of the cost and complexity of developing alternative forest practices

- perceptions of risk and legal liability associated with FRPA and the development of innovative forest practices;
- perceptions of professional accountability and freedom to manage provided under FRPA;
- perceptions and beliefs related to innovation;
- perceptions of the influence of third-party certification on forest practice commitments; and,
- perceptions and beliefs related to environmental, economic and social values more generally.

For some of the FSP's there was more than one prescribing forester who signed and sealed the plan. In total 71 prescribing foresters had signed accountability for the 65 plans, all of whom were all sent a letter of invitation by mail and email to complete the survey. 32 prescribing foresters completed the survey, 30 of which were deemed to be usable[1], and reflected 28 FSP's. This represents a 43% response rate relative to the number of sample FSP's, and a 42% response rate relative to the number of RPF's who were invited to participate. While a 50% minimum response rate is often desirable, a lower level of response can be sufficient to permit analysis if the sample is believed to be reasonably representative of the population (Babbie, 2004).

Data Analysis

Survey data was downloaded from the website into an excel spreadsheet to permit sorting and data analysis. Descriptive statistics were derived for all of the quantitative data using Excel, to identify the range and central tendencies (average and median) of responses provided. Qualitative data collected through open-ended questions was reviewed and sorted into themes, and in several cases used directly in this thesis to support the discussion of central themes.

Given the exploratory nature of this research, the survey included a wide breadth of questions, all of which were analysed and summarized in 2007 in a Report entitled - Phase One Survey Results (see Appendix Two). This document was distributed for review by the author's thesis committee and to the BC Ministry of Forests and Range. A subset of the most relevant survey results and key findings have been incorporated into this thesis

[1] 2 surveys were only partially completed and were therefore not included in the analysis.

1.3.3 Phase Two Research Methods

Case Study Selection

Four FSP's were selected as 'case studies' for the purpose of enabling further, more detailed examination of issues or questions that arose in the review of results from Phase One, to elicit information and perceptions from statutory decision-makers in addition to prescribing foresters, and to validate conclusions drawn from Phase One. The criteria used to select four FSP's as case studies are outlined below.

1. Case studies must be selected from the sample 65 FSP's evaluated in Phase One.
2. Survey respondents must have responded 'yes' to the question "Would you be willing to engage in a phone interview (maximum 45 minutes) to provide further information and insight for this research project?" However, foresters who did not complete the survey in Phase One were still considered eligible for inclusion in Phase Two interviews if they confirmed their willingness.
3. Both the prescribing forester and statutory decision-maker (or designated alternative / tenures staff) for the FSP must indicate willingness to engage in a phone interview.
4. Case studies must include four different statutory decision-makers.
5. At least two FSP's must have commitments to alternative forest practices (to enable examination of definitions of innovation and rationale required for approval of alternatives), and 1 FSP must have commitments to default practices only (to further examine rationale for defaults).
6. Maximize attainment of the following characteristics:
   i. A diversity of company sizes
   ii. A diversity of geographic locations
   iii. A diversity of certification commitments or other policies that might have an influence on environmental practices (e.g. ecosystem-based management).
   iv. Forest licensees that are commonly perceived or characterized as being innovative.

A subset of the 65 sample FSP's that met the above criteria was identified, and an invitation to participate in a phone interview sent to the respective prescribing foresters and statutory decision-makers. The four FSP's ultimately selected for case study analysis are summarized in Table 2 below, along with criteria that supported their selection.

TABLE 2: CASE STUDY CHARACTERISTICS AND CRITERIA FOR SELECTION

Case Study	FSP	Geographic Location	Phase 1 Survey	Size of Company	Tenure Type	Alternative Practices in FSP	Certification / Environmental Policy
1.	# 84	South Central Coast	No	Large	Forest License	Riparian, Stand Level Biodiversity	Sustainable Forestry Initiative EBM
2.	# 53	Cranbrook / Invermere	No	Medium -Large	Tree Farm License	Stand Level Biodiversity. *Note:* Licensee perceived as innovative.	Forest Stewardship Council
3.	#55	Squamish	Yes	Medium	Tree Farm License	Riparian, Stand Level Biodiversity; self-assessed as moderately innovative	Sustainable Forestry Initiative
4.	#26	Castlegar/ Kootenay Lake	Yes	Small-medium	Forest License	None	Sustainable Forestry Initiative

Document Review

For each case study, the FSP and associated background reports were reviewed in detail, along with any other documents pertaining to the management practices within the subject plan area. In particular, certification plans and assessments and sustainable forest management plans (SFMP's) were reviewed wherever these were available. It was of specific interest to assess whether the SFMP's and certification plans provided a more detailed description of the tenure holder's intended forest practices, or indicated any supplemental practices beyond the legal commitments stated in the FSP.

Semi-Structured Phone Interviews

The four prescribing foresters accountable for the case study FSP's and the four statutory decision-makers (SDM's) who approved each FSP initially agreed to participate in phone interviews. However, due to timing conflicts and other challenges, two foresters and three SDM's were ultimately interviewed in July and August of 2008.

Phone interviews were 45-60 minutes long and semi-structured in nature. A slightly different set of questions was asked of foresters and SDM's (see Appendix Three), and opportunities for more free flowing conversation and additional questions provided. Where participants provided their consent, phone interviews were tape-recorded and transcribed. Otherwise, participant responses were manually recorded in note form by the author during the interview. A summary

of the phone interview responses was prepared, and used to support and validate ideas and conclusions presented in the thesis. No further data analysis was carried out on this information.

1.4 Thesis Organization

Chapter One of this thesis provides an introduction to the subject matter, a description of the research objectives and questions, and an overview of the methods used to carry out this research. A review of relevant literature is outlined in Chapter Two, including an overview of comparative approaches to environmental regulation, a discussion of performance-based regulatory approaches, and an overview of regulatory approaches applied commonly applied to forest practices both globally and historically in British Columbia.

Chapter Three provides an overview of the FRPA framework, and evaluates its approach to performance-based management. Chapter Four summarizes the results of this research, obtained through document review and surveys, and Chapter Five provides a discussion of key themes. A summary of findings, conclusions and recommendations for further research is provided in Chapter Six

CHAPTER 2: LITERATURE REVIEW

2.1 Comparative Approaches to Environmental Regulation

2.1.1 Command and Control – the 'First Generation'

Experience with environmental regulation dates back to the late 1960's and early 1970's, when public awareness of the environmental impacts of human activities significantly heightened. Increasing evidence of air and water pollution and resource depletion led many governments, particularly in developed countries, to establish environmental laws and regulations (Gunningham,1998).

This 'first generation' of environmental regulation typically reflected a '*command and control'* approach (Gunningham, 2007; Jordan, 2003), in which a governing body prescribes a desired behaviour or standard in law (the command) and sets up a regulatory agency to monitor and enforce compliance with the standards (the control), using penalties for violation of the commands. Some command and control systems dictate the use of specific technologies or practices that are determined to be effective in achieving the desired environmental outcomes, while others may specify behaviours that regulated entities must adhere to. The U.S. Clean Air Act of 1970 and the U.S. Clean Water Act of 1972 are just two examples of environmental regulation that relied almost exclusively on a command and control approach, in these cases for regulating air and water emissions (Hockenstein, 1997).

Command and control approaches have often proven to be relatively successful at achieving the desired outcomes (Gunningham, 1998; Coglianese and Nash, 2006). Because of their highly prescriptive nature, they are often effective at targeting the precise behaviour to be modified (Stanbury and Vertinsky, 1998). However, they've also been widely criticized for being inefficient, expensive and complex to administer, and for providing little to no incentives for businesses to exceed standards or to innovate. (Bardach and Kagan, 1982; Gossum, 2009; Gunningham, 2007; Hockenstein, 1997). Command and control approaches often require governments to have a comprehensive and accurate knowledge of the workings of industry, and are noted as being vulnerable to political manipulation by regulatory agencies seeking to extend their own interests (Gunningham, 1998). In an increasingly complex and diverse society,

command and control has been described as a 'blunt tool' that is not well suited to meet the challenges of this generation (Gunningham, 2007).

Despite these repeated and extensive criticisms, few authors actually advocate for the abandonment of command and control approaches, but rather that they be considered in combination with other policy instruments that seek to harness the 'enlightened self-interest' of the private sector (Gunningham, 1998). Indeed, command and control instruments remain the most pervasive tools for environmental management today (May, 2007; Jordan, 2003; McDermott, 2009).

2.1.2 'Next Generation' Regulatory Approaches

Over the last couple of decades governments have increasingly experimented with what have been variously termed '*Next Generation Regulations'* (Howlett and Rayner, 2006) and '*New Environmental Policy Instruments*' (Jordan, 2003). Although these terms encompass a wide variety of policy instruments, a common element they share is a general shift towards increasing cooperation between government and business and involvement of private actors in policy formulation and implementation, and decreasing reliance on government intervention and control (Gunningham, 1998; Harrison, 2001, Howlett and Rayner, 2006, May, 2007). Key reasons for this shift are believed to be: decreasing government capacity and autonomy (Howlett and Rayner, 2006); interest in enhancing industry's willingness to innovate; and to improve the likelihood of successful implementation of regulatory regimes (Gunningham, 1998).

The current range of policy instruments used for achieving environmental management goals can be categorized based on the degree to which they depend upon government intervention and control (Figure 1). On one end of the spectrum are traditional command and control instruments, reflecting the highest form of government intervention and coercion. On the other end of the spectrum are industry self-regulation and voluntary agreements, reflecting the lowest degree of government intervention and coercion. In between are incentive-based approaches that seek to incent desired behaviours either through market mechanisms or social influence mechanisms and new/mixed regulatory approaches.

FIGURE 1: POLICY INSTRUMENTS FOR ACHIEVING ENVIRONMENTAL MANAGEMENT GOALS

Low — Degree of Government Intervention and Control — High

Private Self-Regulation	Voluntary Approaches	Incentive Based Approaches (NEPI's)	Mixed/Co- Regulatory Approaches	Traditional 'Command and Control' Regulation
Third Party Certification	Discretionary Guidelines	Market Incentives: Fees, Taxes, Subsidies	Performance-Based Regulation	Technology (Practice) Based Regulation
Industry Standards / Codes	Discretionary Codes of Practice	Social Incentives - Public Reward or Shaming	Management (Process)-Based Regulation	
	Voluntary Agreements	Education and Information	Regulated Self-Regulation	
			Cap and Trade Marketable Permits	

Self-Regulation and Voluntary Approaches

Private self-regulation approaches rely on industry themselves to define the standards or codes of practice to be implemented by their industry and to ensure implementation and monitoring. Third party certification schemes which industry voluntarily chooses to comply with may also be considered a form of private self-regulation. Voluntary approaches, by comparison, reflect a slightly greater degree of government involvement. Guidelines or codes of practice that are developed by regulatory agencies, and provided to industry as voluntary guidance for their consideration, are common examples of voluntary approaches.

While there has been a resurgence of interest in voluntary and self-regulatory approaches over the last two decades, these are by no means 'new' approaches. Voluntary approaches were in fact the norm up until the 1970's and their failure is considered to be one of the reasons governments started regulating (Harrison, 2001). Several authors who have evaluated the effectiveness of voluntary approaches have concluded that their success has been either limited or overstated (Antweiler and Harrison, 2007, Gunningham, 2007; Harrison, 2001, Winfield, 2010).

Some authors note that the success of self-regulation depends to a large degree upon the imminent threat of government regulation (Gunningham et. al, 1998; Walker et. al, 2000). One example is the New Zealand forest sector, where the potential for government regulation of non-performers was noted by both industry and the public as being vital to the success of this largely 'self-regulatory' regime (Walker et.al, 2000). These authors also note that industry's response to self-regulation has been highly variable, in part due to the high costs associated with information collection, monitoring and assessment. Larger companies with greater access to financial resources were more willing to invest in self-regulatory systems (Walker et. al, 2000).

Incentive-Based Approaches

Policy instruments that are designed to incent individuals or organizations to engage in particular activities or behaviours are grouped under the category of 'incentive-based approaches'. Incentives may be market-based (e.g. taxes, subsidies and fees) and alter price signals in a way that encourages desired behaviours by individuals or organizations. Market-based approaches are often commended for their cost effectiveness and ability to incent innovation in practices and technology (Hockenstein, 1997). However, in comparison to traditional command and control approaches, market-based incentives have a lower probability of achieving a particular set of desired behaviours, and require a longer time frame to do so (Stanbury and Vertinsky, 1998).

Incentives may also be provided through the use of information that seeks to publicly reward desired behaviour or cast shame on undesirable behaviour. 'Informational regulation' as it is coined by some authors, is a potentially effective approach when the subjects of regulation are large, publicly held companies that are vulnerable to investor perceptions and desire to protect a 'social license' for their activities (Gunningham, 2007).

Regulation

Regulation remains a popular instrument used by governments to achieve environmental management goals. In comparison to the traditional command and control approach to regulation defined previously, newer approaches emphasize a greater degree of cooperation and shared accountability with the industry being regulated.

Coglianese and Lazer (2003) distinguish between three types of regulation: *technology (or practice) based regulation,* where firms are required to adopt certain technologies or practices in order to achieve desired environmental outcomes; *management (or process) based regulation,* where firms are required to develop or adhere to defined processes or plans for achieving environmental goals, and; p*erformance-based regulation,* where a desired environmental outcome or standard is specified by the regulator, but the firm may choose how to achieve that level. Practice-based regulations are commonly employed in traditional command and control systems, while process and performance based regulations reflect more contemporary co-regulatory approaches.

Management-based regulation is believed to offer several advantages over traditional regulation, including cost-efficiency, increased effectiveness and increased levels of compliance. It is argued that firms usually posses the best information and understanding of the systems being regulated, and are therefore more likely to develop effective and efficient procedures for achieving environmental objectives. It is further suggested that firms are more likely to ensure compliance with rules developed by their own organization, than those developed by government (Coglianese and Lazer, 2003).

As performance-based regulation is of central interest to this thesis, it is discussed in greater detail in the following section.

2.1.3 Performance-Based Regulation

Performance-based regulation has become increasingly popular with policy makers and academics over the last couple of decades[2] (Gunningham, 2007; May, 2003, May 2007). The fundamental principle underlying this approach is regulating for results rather than regulating the means for achieving results. In theory, the regulator defines the goals and/or performance standards to be achieved, and the regulated entity has the discretion to determine the most appropriate means for achieving the desired results. Performance-based regulation is commonly upheld to be a cost-effective approach that has the promise of fostering innovation, based on the assumption that firms possess the best understanding of the systems being regulated, and are

[2] For example, Executive Order No. 12866, issued by President Clinton and retained by President Bush, directs agencies wherever feasible to specify performance objectives, rather than behavior, in crafting new regulations.

therefore better poised to identify the most cost-effective practices or technologies (Coglianese and Lazer, 2003).

May (2003) identifies three fundamental components of all performance-based regulation: 1) the characterization of desired outcomes or goals for the regulation; 2) the specification of desired performance standards and; 3) procedures for measuring the level of performance that is attained. There can however be significant variation in the characterization and specificity of all three elements. While performance-based regulation is often assumed to be less prescriptive than traditional regulation, in practice this may not always be the case. It depends upon the specificity of performance objectives, the extent to which performance standards are quantified, and the mechanisms for monitoring or predicting performance (Coglianese and Lazer, 2003; Howlett, 2009; May, 2003). Table 3 below provides examples of the variation that can be found in performance-based regulation.

TABLE 3: DIMENSIONS OF PERFORMANCE-BASED REGULATION

Dimension	***Variation***	***Examples***
Characterization of Outcomes	Comprehensive (high level)	• Region-wide air quality goals • Building regulation goals for protection of life-safety and economic value of a structure
	Less Comprehensive (low level)	• Facility specific goals for air quality emissions • Building regulation goals for performance of individual components
Characterization of Performance Standards	Quantitative Performance Standards	• Ambient air quality threshold based on documented health effects • Required forces that a building can withstand for a specified amount of time without collapse.
	Qualitative Performance Standards	• Requirement that performance is at least equivalent to that obtained by prescriptive standards • Qualitative statement that a building shall remain stable and not collapse during construction or throughout the life of the building
Performance Assessment	Observed Measurement of Performance	• Physical measurement of air quality or emissions • Physical tests of performance of building materials or elements
	Predicted Performance	• Model based predictions of performance of a building system for collapse prevention or fire resistance

Source: May 2003

Several authors contend that the effectiveness of performance-based regulation is highly dependent upon the ability to identify clear, measurable objectives or performance standards, and the capacity of regulators to monitor and enforce industry performance (Bluff, 2003; Coglianese and Laser, 2003; Hoberg, 2003; May, 2003, May 2007). However, there is often a fundamental tension between defining objectives and performance standards with sufficient specificity to ensure desired outcomes are clear and measurable, while still affording the flexibility in the choice of technology or practices that is the hallmark of this approach (Bluff, 2003; May, 2003).

In some regulatory contexts, the identification of quantifiable performance standards can be very challenging, if not impossible. The identification of optimal thresholds requires a detailed understanding of the cause and effect relationship between thresholds and the ultimate objective or desired outcome (Coglianese et al, 2003). For example, in order to determine optimal thresholds for air or water emissions, there must be an understanding of the relationship between such emissions and the likely outcomes for human health. In a regulatory setting such as forestry, the relationships between specific forest practices and their effect on environmental values are often poorly understood (Stanbury and Vertinsky, 1998).

The proposition that performance-based regulation is likely to be more cost-effective than traditional regulatory approaches is challenged by some scholars. Hoberg (2003) challenges the underlying assumption that firms always possess the best information and knowledge of the system being regulated. With respect to forest practices regulation in BC, he suggests that governing agencies developed detailed guidance documents because of the fact that operators frequently lacked sufficient knowledge and expertise in appropriate forest practices, and further contends that there are economies of scale in having this information developed by centralized bureaucracies. Coglianese et. al (2003) suggest that performance-based regulation can impose excessive costs on business, particularly small firms, who may lack the resources to determine how to meet regulatory standards. Such firms may prefer to be told what to do or have default codes of practice provided, rather than incur the costs of developing the practices themselves. Regulatory costs can also be significant for governing agencies who are charged with designing and implementing effective procedures for assessing the performance of firms, particularly if performance standards are vague (May, 2003). One further drawback to performance-based

regulation noted by Coglianese et al (2003) is that (like traditional regulation) it does not provide any incentive for firms to go beyond compliance.

Despite the increased interest in and experimentation with performance-based regulation over the last couple of decades there has been relatively little empirical analysis of the effectiveness of performance-based regulation across different regulatory settings (Coglianese et. al, 2003). One notable example however is an assessment by May (2003) of what he describes as a flawed performance-based regulatory regime in which ample flexibility was provided to industry without sufficient accountability. In this case, the New Zealand government reformed their regime for the regulation of building safety from a traditional command and control approach based on centralized prescriptive, detailed codes of practice to a performance and market-based regulatory approach. This reform was widespread across many regulatory contexts and reflected the government's preference for limited intervention and faith in the markets.

Broad objectives for protecting people, their health and safety, and the environment, along with more detailed sub-objectives that identified desired building performance were established within the *New Zealand Building Act of 1991*. Responsibility for implementation and compliance assessment was delegated to local authorities, and market-like mechanisms were introduced that allowed for certification of compliance with desired performance standards by either private certifiers or local authorities, and encouraged innovation in building materials. Bluff (2003:pp) summarizes the results of this new approach.

> Under the new approach, builders were able to determine design and construct solutions without accountability, there was no performance requirement regarding the provision of shelter, there was a lack of detail concerning necessary controls for external moisture, a latitude to innovate with low-cost building material, and lapses amongst third party and local government certifiers. These failures led to a race to the bottom in building standards, with severe economic damage to building owners, insurers, local authorities and others.

A 'leaky building crisis' ensued in which an estimated 18 000 homes and hundreds of multi-unit buildings were affected, many of which became uninhabitable. May (2007) contends there were shortfalls in three levels of accountability under this performance-based regime that ultimately led to this crisis. The first was a shortfall in legal accountability – owing to the imprecise nature of the goals that defined 'durability of structures'. The second was a lapse in bureaucratic accountability, as there was no requirement under the 1991 Act for inspections of buildings under construction, although local governments could elect to do so. And finally, the lack of licensing requirements for builders is what May considers a shortfall in professional

accountability – a critical issue for effective performance based regulation given its general shift from bureaucratic accountability to increased professional accountability. Government response to the crisis included revisions to the Building Act to provide more specific performance standards, requirements for building inspections and tighter licensing provisions for building certifiers (May, 2007).

While the use of performance-based regulation has increased over the last two decades, it has by no means fully replaced more traditional forms of protective regulation. Further, when it is provided, it is often presented as an alternative to existing prescriptive regulations (Coglianese et. al, 2003). As with all regulatory approaches, performance-based regulation offers advantages that will be suitable for some regulatory contexts, and inappropriate for others. Table 4 below provides a summary of the expectations for performance-based regulatory regimes, as indicated in the literature.

TABLE 4: SUMMARY OF EXPECTATIONS FOR PERFORMANCE-BASED REGULATORY REGIMES

Regulatory Effectiveness	Increased, but limited incentive to go beyond minimum
Flexibility	Increased, given ability to use alternate means to reach objectives
Innovation Potential	Increased incentives, but depends on industry structure and cost of innovation compared with current approaches
Consistency in application of rules	Potential for inconsistencies in interpretation of what is acceptable
Predictability in regulatory expectations	May decrease due to lack of understanding of what is a workable means for achieving desired ends
Cost to Government	Uncertain – greater costs of developing rules and enforcement
Cost to Regulated entities	Decreased or no change in compliance costs
Cost to Public	Decreased or no change – not addressed in the literature; presumably benefit from lower costs to regulated entities and innovations
Equity in treatment of regulated entities	Uncertain – competitive differences may emerge due to large firms having advantage in developing alternative approaches.

Adapted from May, 2003

2.1.4 Designing 'Optimal' Regulatory Approaches

Virtually all scholars of regulation acknowledge that there is no one 'best' policy instrument or regulatory approach for achieving environmental management goals. The optimal approach for any given situation will depend upon a number of factors, such as: the types of firms, the complexity of tasks and the potential for harm or risk associated with the industry (May, 2007); the homogeneity of regulated entities and the capacity of the regulator to assess outputs

(Coglianese and Lazer, 2003); the characteristics of the problem being addressed and the political environment in which standards are developed (Hoberg, 2003); the capacity of both the private sector and the public sector (Howlett and Rayner, 2006); and, the motivations of the actors and industry being regulated (Gunningham, 2007). In designing a regulatory approach, scholars commonly recommend the following evaluative criteria: 1) *effectiveness* – the degree to which the approach is likely to be successful and precise in achieving desired outcomes; 2) *economic efficiency* – the costs to society as a whole, governing agencies and regulated entities of the proposed regime; 3) *distribution of costs and benefits* – the fairness of the distribution of costs and benefits; and 4) *political acceptability* – the likelihood that a proposed approach will supported by politicians (Jaccard, 2007; Winfield, 2010):

Coglianese and Lazer (2003:704) suggest that an optimal regulatory approach is 'that which, under given conditions, achieves the greatest net social gain or that minimizes both the regulated entities compliance costs and the government's costs of selecting and implementing a standard that achieves a given regulatory objective'. They identify the following as key factors that influence the potential effectiveness of each approach: the capacity of the regulator to assess outcomes, and the homogeneity of regulated entities. Where firms are relatively homogeneous in their operations and technology, technology (or practice)-based regulations may provide a cost-effective way for governments to achieve their environmental goals. Where firms are relatively heterogeneous, and where the ability to assess desired environmental outcomes is low or costly, management (or process)-based regulation may offer the most effective approach. As the capacity to clearly identify and assess desired environmental outcomes increases, performance-based systems can be a viable instrument (Coglianese and Lazer, 2003).

Howlett and Rayner (2006) offer a framework for determining the optimal regulatory approach based on the capacity of both the private sector and the state, as outlined in the table below.

TABLE 5: STATE AND PRIVATE SECTOR CAPACITY INFLUENCES ON REGULATORY APPROACHES

Private Sector Capacity	State Capacity	
	High	Low
High	Regulated Self-Regulation	Private Self-Regulation
Low	Command and Control Regulation	Ineffective Regulation

Source: Howlett and Rayner (2006) adapted from Knill and Lehmkuhl, 2002.

Many authors suggest that an optimal regulatory approach usually entails the use of a mix of policy instruments, including traditional and newer approaches to regulation, market-based and informational incentives, self—regulation and voluntary approaches (Coglianese et. al, 2003; Gossum et. al, 2009; Gunningham, 2007; Walker, 2000). More recently, several authors have adopted the notion of 'smart regulation'. According to Howlett and Rayner (2004:pp) the term "was first coined in the context of environmental policy to describe a post-command and control implementation style expected to be capable of dealing with increasingly technically and politically complex policy issues". Gossum et. al (2009) posit that "'smart regulation' reflects a middle ground between advocates of strong state regulation and those who favour deregulation, by recognizing a continued for role for government intervention, but only selectively and in combination with a variety of market and non-market, public and private solutions. They emphasize, however, that "'smart regulation' is not yet a coherent theory, but more a heuristic framework" (Gossum et. al., 2009:pp). These authors provide a summary of a principles and indicators to evaluate 'smart' instrument design, as outlined in Table X below.

TABLE 6: PRINCIPLES AND INDICATORS TO EVALUATE "SMART" INSTRUMENT DESIGN

Principles	Indicator	Preferable State of Indicator
No perverse effects[1] of other policies	Absence of perverse effects	Perverse effects are absent or small
Broad range of complementary instruments	Diversity	A large diversity of policy instruments is used when this is needed to solve the problem
	Complementarities	The instruments used have no negative effects on each other
Broad range of institutions	Regulatory pluralism	Existence of surrogate regulators
	Empowerment	Government empowers surrogate regulators, when needed.
Develop or use NEPI's[2]	Use of NEPIs	NEPIs are used to improve the existing instrument mix
Invoke motivational and informative instruments	Use of motivational and informative instruments	Regulatees know the reason for the policy and the different instruments that are used to regulate them. In addition, they have enough knowledge and are motivated to implement the policy.
Prefer less interventionist Measures	Preference of less interventionist measures	Policy-makers started with the lowest possible intervention level
Ascend a dynamic pyramid	Instrument sequencing	More interventionist instruments can be used when less interventionist instruments fail
	Big stick	Big stick exists and will be used when necessary
Win-Win	Win for regulatees	Regulatees perceive policy as an advantage for them
	Win for government	Adequate monitoring and explicit benchmarks exist

Source: Gossum et. al. (2009).

[1] 'Perverse effects' promote behaviour that cause unsustainable resource use. Policy integration, i.e. a process of uniting and harmonizing separate policies to produce an integrated and coherent policy system, is seen as a solution to avoid perverse effects

[2] New Environmental Policy Instruments (NEPI's) – e.g. property rights instruments, carbon offsets, certification, community based management.

Gossum et. al (2009) applied the above principles and indicators of smart regulation in an evaluation of the effectiveness of the regulatory approaches used by the Dutch and Flemish to achieve similar forest management goals. They determined that the Flemish interventionist approach, which focused on more traditional regulatory instruments, was less effective than the Dutch 'smart regulation' approach, which used a broad mix of instruments. They concluded that smartly formulated instrument design can have a considerable influence on policy success, but also acknowledged the importance of a supportive and stable institutional and policy context.

2.2 Environmental Forest Practices Regulation

Over the last few decades, societies have increasingly advocated for the conservation and protection of environmental values, such as biodiversity, wildlife habitat, water quality and fish habitat, within forests that are also managed for timber production. The following sections provide a summary of the literature regarding global and local approaches to environmental forest practices regulation.

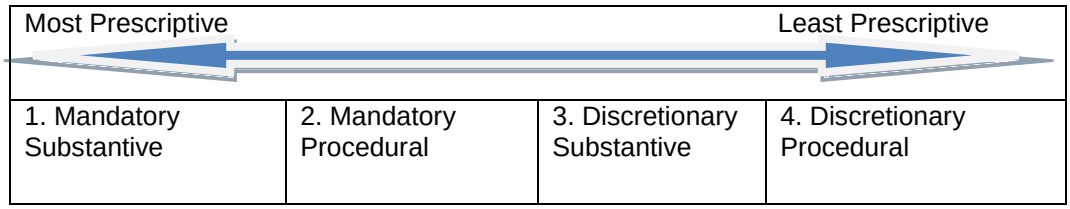
2.2.1 Global Approaches to Environmental Forest Practices Regulation

Most jurisdictions across the globe have instituted some level of regulation or standards for forest practices (Cubbage, 2007). Regulatory approaches reflect the full spectrum of policy instruments from voluntary guidelines or codes of practices, to performance and management based regimes, to traditional command and control regulatory approaches. However, some authors suggest that command and control regimes remain the dominant approach used in forest management (McDermott, 2009). Regulations are commonly developed to address the following values and issues: clear-cut size, reforestation, water quality and quantity, wetlands, fish and wildlife, threatened and endangered species, biodiversity, road building, timber harvesting and illegal logging, and in some cases aesthetics, reserves of natural areas, and rotation ages (Cubbage, 2007).

In 2004, Cashore and McDermott completed a comparative evaluation of forest practice regulations across 39 different jurisdictions, including 4 Canadian provinces and 15 US states. Their goal for this work was to provide insight into how Canada's environmental forest practices regulations compare with the rest of the world's, and how comparisons can be made across

jurisdictions, given the complexity of different approaches and political contexts (Cashore and McDermott, 2004). For their work they devised four broad categories of approaches to forest practices regulation, as outlined and defined in Table 7 below.

TABLE 7: GLOBAL APPROACHES TO FOREST PRACTICES REGULATION



Approach	***Definition***
Discretionary	Rules encourage, but don't require a course of action (voluntary)
Mandatory	Rules require a specific course of action
Substantive	Rules address on the ground changes (practice-based regulation)
Procedural	Rules address management systems, rather than on-the ground changes (management-based regulation)

Their evaluation focused on regulation that addresses the following practices: riparian management (buffer zones); clear-cutting; road building; reforestation, and; allowable annual cut determination. Table 8 below summarizes their findings with respect to characterizing the approaches used to regulate each type of forest practice across the 39 case studies.

TABLE 8: REGULATORY APPROACHES APPLIED IN 39 JURISDICTIONS

Forest Practices	**Regulatory Approach**			
	Mandatory Substantive (Practice-based)	**Mixed Rules[1]**	**Mandatory Procedural (Management-based)**	**No Rules / Discretionary**
Riparian Management (37 cases)	54%[2]	11%[3]	9%	27%
Clearcutting (38 cases)	42%[4]	8%[5]	11%	39%
Road Practices[6] (36 cases)	11%	36%[7]	14%	39%
Reforestation	42%[8]	13%[9]	18%	26%
Allowable Annual Cut	8%[10]	19%[11]	21%[12]	53%

[1]Reflects a mixture of regulatory approaches
[2]Mandatory riparian buffer zones, including no harvest (38%) and special management zones
[3]Special management buffers without fixed widths
[4]Maximum clear cut size limits
[5]Clearcut limits that affect a portion of lands

[6]Culvert size at stream crossings and decommissioning requirements
[7]Mixed means mandatory substantive rules are general rather than prescriptive (i.e. control erosion rather than specific prescriptions such as remove all drainages and re-contour the road)
[8]Mandatory stocking levels and timeframes
[9]Mandatory stocking levels but no timeframes
[10]AAC limits with requirement for non-declining even flow
[11]AAC limits with required for sustained yield but not even flow
[12]AAC limits with no requirement for even flow

There are a few points worth noting from their results. First, the predominant approach to regulating riparian management, clearcutting and reforestation are mandatory, substantive rules (practice-based regulation), while discretionary approaches predominate for road building practices and the determination of allowable annual cut. Furthermore, discretionary (voluntary) approaches are applied in some 30% of jurisdictions for all practices evaluated. There is a limited application of process (management-based) approaches, ranging from 8 to 20% of cases depending upon the practices, and a similar proportion of cases reflected 'mixed rules' in which a mixture of regulatory approaches are applied. With respect to the stringency of rules, they found that Alberta, BC, California and the US Forest Service had the strictest regulatory environments across the 39 jurisdictions evaluated.

The authors concluded that none of the policies assessed in their work reflected a results or performance-based approach to regulation, although they suggest that procedural approaches may sometimes function in a similar manner by providing flexibility to adjust management practices (Cashore and McDermott, 2009). In a review of the regulatory approaches to riparian management and reforestation applied by four jurisdictions (BC, Alberta, Washington State and Georgia) Hoberg (2003) concluded differently in one instance - that reforestation was one area where performance-based standards are commonly applied, and suggested this is likely because of the ease with which tree height and density can be measured. Hoberg's four case studies otherwise confirmed varying approaches to practice-based regulation, management or process-based regulation and voluntary guidelines. Hoberg further commented on the increasing use of a pluralism of regulatory approaches to deal with heterogeneous conditions – for example the legislation of general performance requirements complemented by a requirement for mandatory planning by certified professionals, and supported by detailed guidelines.

Stanbury and Vertinsky (1998) specifically evaluated the application of incentive-based regulatory approaches in forestry, and noted that there was relatively little use, despite widespread support in the literature for new market-based instruments. They concluded that this

is due to the nature of the problem being confronted in the forestry context: goals for sustainable forestry are often not clearly defined; some goals are aesthetic and therefore difficult to define and measure; the state of knowledge is limited regarding environmental benefit or damage as a result of activities, and the interdependences among regulated activities; and, the precise means required to achieve goals not always known, and many behaviours may appear to be consistent with the goal. Their conclusions are likely entirely relevant in explaining the fairly limited application of new co-regulatory approaches as well, including performance based management.

2.2.2 BC Approaches to Environmental Forest Practices Regulation

The history of forest practices regulation in BC reflects a continued evolution in policy approaches and instruments used to achieve environmental management goals. Five distinct policy eras can be identified, as outlined in Table 9 below.

TABLE 9: ERAS OF FOREST PRACTICES REGULATION IN BC

Era	Dominant Policy Goal	Approach to Environmental Forest Practices Regulation
1850 - 1947	Settlement & Industrial Forestry Expansion	None
1947 - 1972	Industrial Expansion and Sustained Yield Management	Sustained Yield Harvest Regulation
1972 – 1995	Multiple Use Forestry	Voluntary Environmental Guidelines
1995 - 2004	Sustainable Forest Management	Command and Control Regulation (Practice-Based and Process-Based)
2004 - 2010	Sustainable Forest Management	Mixed Regulation (Performance-Based, Practice-Based and Process-Based)

Source: Adapted from Drushka, 1999; Hoberg, 2001a; Hoberg, 2001b, and BC MoF, 2004d.

Prior to the 1970's, expansion of the forest industry in BC was clearly a dominant policy goal. Policy instruments were focused on providing for a sustained yield of timber from the land base, including harvest regulation and reforestation requirements, with virtually no other requirements for the management of environmental values (Hoberg, 2001b). As concern for the impacts of forestry on environmental values continued to mount throughout the 1960's and 70's, the BC government responded with the development of a multitude of voluntary guidelines for forest

practices, beginning in 1972 and continuing into the early 1990's[3]. Amendments to the Forest Act in 1978 enshrined new policy goals for 'multiple use forestry', although there were only a couple of incidental references to the management of environmental values (Hoberg, 2001b).

These voluntary forest practice guidelines clearly failed to effect an improvement in forest practices. Increasing public dissatisfaction with forest practices ultimately led to a 'war in the woods', with several public protests and acts of civil disobedience in the late 1980's and early 1990's (Hoberg, 2001b; Reader, 2006). Field assessments carried out in 1992[4] and 1994[5] - the so-called 'Tripp reports' – confirmed evidence of poor compliance with forest practice guidelines (Hoberg, 2001b; Reader, 2006). The Minister of Forests at the time publicly acknowledged that he was 'absolutely appalled' at the forest practices that were exposed in the Tripp reports (Hoberg, 2001b).

This fundamental context precipitated a momentous change in forest practices regulation in BC in the 1990's – strong public pressure for change, independent evidence of the failure of the current regulatory regime, increasingly successful international environmental campaigns, and the election of a new government in 1991 that was committed to environmental change (Hoberg, 2001b). Development of a new regulatory approach began shortly after the NDP were elected in 1991, and culminated in the establishment of the Forest Practices Code Act of BC (the FPC) in 1994 – described by some as the epitome of command and control legislation (Reader, 2006).

A 1993 public discussion paper identified the problems that the FPC was specifically designed to overcome: a confusing array of instruments governing forestry, including 26 statutes, 700 regulations and 3,000 guidelines; inconsistent or nonexistent application of guidelines and standards; poor forest stewardship; inadequate monitoring and enforcement, and weak penalties (BC, 1993). In response, the FPC provided one comprehensive legislative framework that amalgamated all forest practice requirements in one location, and made them mandatory and enforceable. The FPC framework included one statue, 19 regulations, 7 legally binding

[3] For example: 1972 Coast Planning Guidelines; 1980 Land Management Handbook (#1) on Streamside Management; 1988 Coastal Fish Forestry Guidelines; 1989 Interim Harvesting Guidelines for the Interior of BC; and 1992 Coast Harvest Planning Guidelines.

[4] *The Application and Effectiveness of the Coastal Fisheries Forestry Guidelines in Selected Cut Blocks on Vancouver Island*, April 1992, Tripp Biological Consultants Ltd..

[5] *The Use and Effectiveness of the Coastal Fisheries Forestry Guidelines in Selected Forest Districts of Coastal British Columbia* (January 1994, Tripp Biological Consultants Ltd.).

guidebooks and 35 non-binding guidebooks. Mandatory practice requirements embedded within the Act and regulations reflected a practice-based approach to regulation, while mandatory requirements for the development of six different types of operational plans reflected a process-based regulatory approach. Importantly, section 41(1)(b) of the FPC Act afforded significant decision-making discretion to statutory decision makers to determine requirements for 'adequately managing and conserving forest resources'. The FPC also introduced stronger compliance and enforcement provisions, including dramatically increased maximum fines of $1 million, and the establishment of an independent 'forest practices watchdog' – the Forest Practices Board.

The FPC has been lauded for creating a level playing field of standards for tenure holders (Reader, 2006), and clearly acknowledged for having improved forest practices in the province, particularly for streamside management and the quality of roads (BC FPB, 2006, Hoberg, 2001b). However, it was also widely criticized for being overly prescriptive and inflexible, stifling to innovation, exacting high transactional costs on industry and government, and creating an era of 'cookbook forestry' (BC FPB, 2006, Reader, 2006).

Persistent criticism and a significant downturn in the forest industry in 1996 led the province to amend the FPC in 1997 in the interest of streamlining administration and reducing costs to industry and government, while still maintaining the same environmental standards (Hoberg, 2001b). While the Bill 47 amendments did effect some relief in administrative costs, pressure continued for further regulatory reform away from command and control regulation and towards a results-based regulatory approach. The resultant Forest and Range Practices Act, established in 2004, is evaluated in detail in Chapter 3.

2.3 Defining Innovation

The term innovation is simply defined in the Merriam-Webster dictionary as 'the introduction of something new', and 'a new idea, method or device'[6]. Scholars of innovation have variously expanded or revised this definition to emphasise the requirement for an idea or object to be *perceived* of as something new by an individual or unit of adoption, even if it's not objectively

[6] http://www.merriam-webster.com/dictionary/innovation

new (Rogers,1995,11) and the requirement to be adopted or implemented in practice in order to be called an innovation (Innes,2009). The degree of success of an innovation can be determined by extent to which it is implemented in practice (Innes, 2003; Rogers, 1995). Innovations can also be distinguished as incremental – involving a small series of changes that ultimately result in a new practice or product – and transformative – involving for example the entire replacement of a product line with a new one (Innes, 2009).

Much of the literature on forestry related innovation is focused on innovations in manufactured forest products or specific technology rather than forest practices – which are the focus of this research. One notable exception however is an evaluation by Innes (2003) of the success of various BC forest policy initiatives in the 1990's in achieving objectives related to innovation in forest practices. Innes concluded that the BC government's Enhanced Forest Management Pilot Projects and Innovative Forest Practices Pilot projects had resulted in some useful, small-scale developments, but were unlikely to lead to significant innovation in the forest sector. He suggests two key reasons for this: the government's unwillingness to abandon a command and control approach to regulation, as well as insufficient investment in research and development in the forest sector generally and linkages between research and policy development specifically.

With respect to the 'Results-Based Forest Practices Code Pilot Projects' (some of the results of which were ultimately incorporated into the FRPA framework), Innes noted that while they appeared to provide some promise of the regulatory flexibility required to support innovation, it was too early in their implementation at the time to effectively evaluate their success. He concluded by stressing the importance of new policy approaches enabling an adaptive management approach, including thorough testing of new forest practices through controlled experiments, and a well structured and credible research and development program.

While the BC *Forest and Range Practices Act* and associated regulations do not specifically define innovation or innovative practices, government communication documents define support for innovation as a key goal of the legislation. A FRPA administrative guidance document clearly encourages the development of innovative practices, and identifies potential benefits of innovation as leading to cost savings, operating efficiencies, enhanced environmental values, competitive advantage and new product development (BC MoFR, 2010, 44). It further notes the

importance of communicating new ideas and practices, and an adaptive management process that enables the application of new learning over time (BC MoFR, 2010).

In his foundational work, *The Diffusion of Innovations (1962)* Everett Rogers seeks to explain how, why and at what rate innovations diffuse through any given social system. He defines *diffusion* as "the process through which an *innovation* is communicated through certain channels over *time* among the members of a *social system*" (Rogers,1995,10), and identifies five categories of adopters in any given culture: innovators, early adopters, early majority, late majority and laggards. Rogers proposes that the rate of diffusion generally follows an S-curve over time with innovators leading the adoption process, and the rate of diffusion increasing significantly once an innovation reaches 10 to 25% adoption within the social community. Rogers also contends that there are five factors that will influence the rate of adoption of an innovation by an individual: 1) its *relative advantage* over the previous generation; 2) its *compatibility* with an individual's life; 3) its level of *complexity or simplicity* – the simpler it is the more likely it will be adopted; 4) its trialability – the easier it is for an individual to experiment with its use, the more successful it will be, and; 5) observability – the extent to which an innovation is visible to an individual and the members of the society.

While the question of the rate of diffusion of any particular forest practice innovation may be of interest to future research, this research seeks to first evaluate whether the FRPA framework provides the regulatory flexibility and incentive for tenure holders to test new ideas and approaches - a fundamental requisite for the innovation process.

CHAPTER 3: EVALUATING THE FRPA APPROACH TO PERFORMANCE-BASED MANAGEMENT

> *"British Columbia will achieve high-quality forest management as a result of the results-based forest and range practices regime. It offers a new way of doing business—it encourages innovation and it holds industry responsible for outcomes…Under the forest and range practices legislation, government and industry resource professionals are more interested in on-the-ground results and resource protection than process and paperwork. Government sets objectives and desired outcomes, and forest companies propose results or strategies that reflect these. The companies are then accountable for the results through a rigorous government compliance and enforcement regime" (BCMoF, 2004a)*

In January 2004, the Forest and Range Practices Act (FRPA) came into effect in B.C. Since its inception, FRPA has been widely touted as a 'results-based' approach to forest practices regulation that would overcome the failings of the former Forest Practices Code (FPC). While the FPC has been acknowledged for having significantly improved forest practices in the province (FPB, 2006), it has also been widely criticized for being overly prescriptive, stifling to innovation, and exacting high transactional costs on industry and government (MoF, 2004a). FRPA was developed in response to these criticisms, and its formulation guided by the following goals:

- reduce transactional and operational costs to industry
- reduce the Code's administrative complexity
- *provide industry the 'freedom to manage' in delivery of defined results and open the door to innovation in forest practices*
- maintain the Code's environmental standards
- continue to balance social, environmental and economic interests, and
- maintain and enhance the level of public acceptance of forest and range management.

(BC, 2004; Vold, 2003).

This chapter provides an overview of the Forest and Range Practices Act framework[7], and an evaluation of its performance-based approach to forest practices regulation. It concludes with a

[7] The term FRPA framework is used to collectively refer to all instruments (legal and non-legal) and institutions supporting the implementation of FRPA.

discussion of the potential strengths, weaknesses and challenges associated with the FRPA approach, and with the application of performance-based regulation to forest practices more generally.

3.1 Overview of the FRPA Framework

The FRPA framework relies on one statute (FRPA) and twelve supporting regulations to collectively provide the legal basis for a regime that is centered on three key components:

1) ***Objectives*** that are set by government to identify the desired outcomes for forest management;
2) ***Plan and Practice Requirements*** that compel forest tenure holders to develop forest stewardship plans for their operating areas and site plans for cutblocks and roads, and define mandated and 'default' standards for forest practices, and;
3) ***Compliance Auditing and Enforcement*** that is undertaken by Ministry of Forest and Range (MoFR) staff, and by an independent agency – the Forest Practices Board (FPB).

Outside of the legal realm are two additional elements that are of central importance to the FRPA framework:

1) Professional reliance[8] underpins the entire framework, with the accountability for plans and prescriptions accorded primarily to licensed professionals and tenure holders, rather than the government, and;

2) Effectiveness Evaluation is also undertaken by the provincial government, to assess the effectiveness of the FRPA regime in achieving stewardship of eleven identified forest values.

While it is commonly described as a 'results-based regime', the FRPA framework actually embodies a complex mixture of regulatory approaches. There are mandatory requirements for the development of Forest Stewardship Plans (FSP's) and site level plans[9], consistent with a process-based regulatory approach. There are also some mandatory practice requirements, consistent with a practice-based approach to regulation, in which no flexibility is accorded to

[8] Professional reliance is defined as relying on (a) the judgement of the appropriate professional(s) to, among other things, design, prescribe and assess the appropriate measures to achieve forest and range resource objectives, and (b) the accountability attached to that professional or those professionals through their regulatory body (BC, 2004)

[9] FSP's are the only plan that requires government approval. The FPC by comparison required the approval of 6 operational plans.

tenure holders. And finally much of the framework is modeled around a performance-based regulatory approach, although even those elements vary widely in the degree of flexibility they actually provide for forest practices.

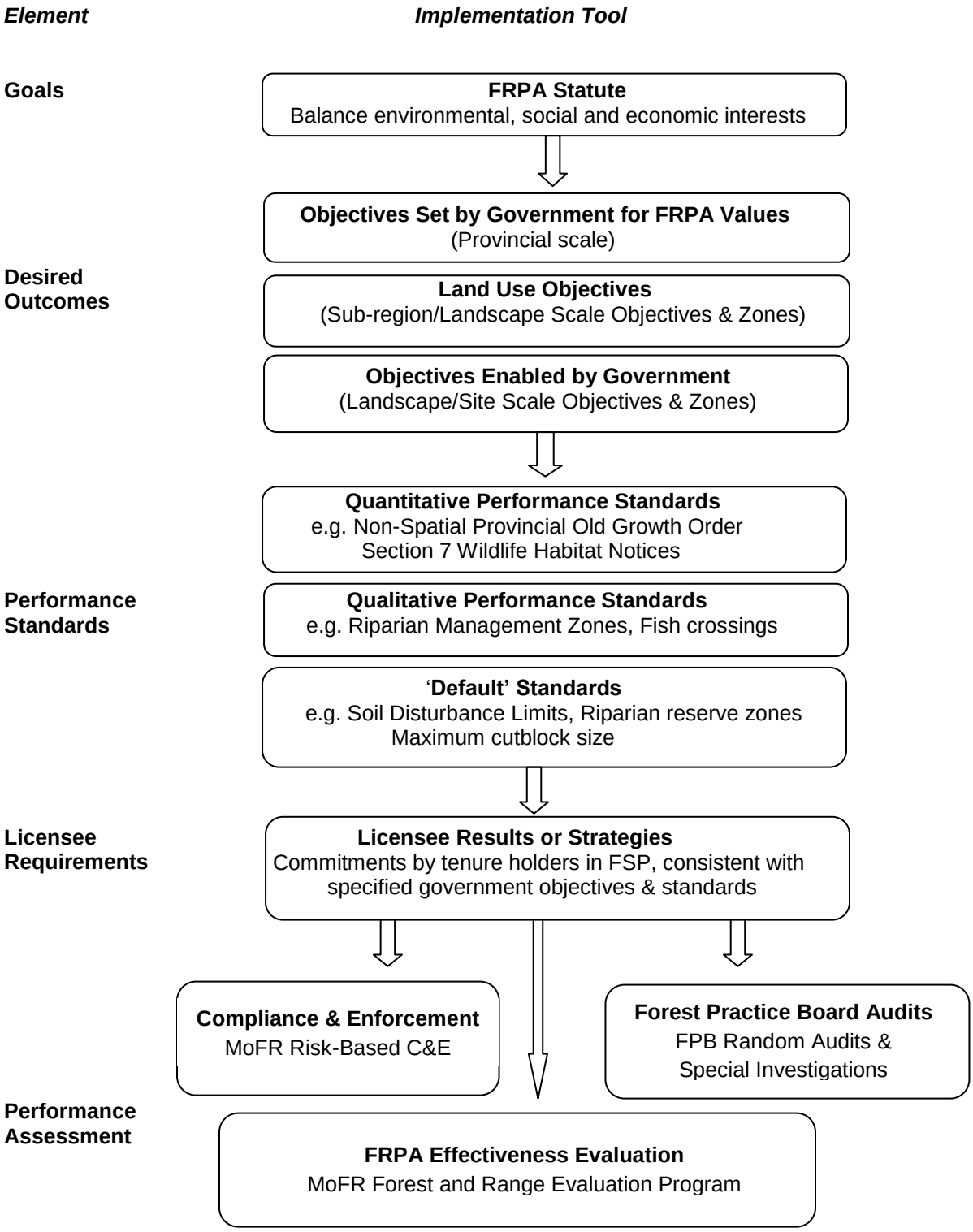
3.2 Examining the FRPA approach to Performance-Based Regulation

May (2003) identifies three fundamental elements of all performance-based regulation:
1) the characterization of desired outcomes or goals for the regulation; 2) the specification of desired performance standards, and; 3) procedures for measuring the level of performance that is attained. Performance standards may in some cases be embedded directly within statements of desired outcomes, or separately, depending upon how the desired outcomes are written. Where desired outcomes are expressed at a very high level, it is usually necessary to then supplement these with performance standards that identify measurable or verifiable results that are to be achieved.

The FRPA framework includes all three elements of performance-based regulation. Its approach to these elements however is complex and variable. For example, desired outcomes are expressed through three different types of objectives, identified at different scales and specificity and through different regulatory mechanisms. There are different approaches to performance standards: some are expressed quantitatively, some qualitatively, and some as default performance standards that tenure holders can choose to comply with or to propose alternatives for approval by government. For some elements, there are still mandatory practice requirements that are more akin to a prescriptive practices-based approach to regulation. Licensees are required to specify results or strategies that they will apply that must be consistent with government's objectives. If licensees elect to specify strategies then the focus of compliance monitoring will be on process, and if they specify results, the focus of monitoring will be on stated outcomes.

An overview of the various elements of the FRPA framework is provided in Figure 1, and described in further detail in the sections following.

FIGURE 2: KEY ELEMENTS OF THE FRPA FRAMEWORK



3.2.1 The Eleven FRPA Values

There are eleven key values regulated under the FRPA framework: soils, wildlife, biodiversity, riparian areas, water, timber, cultural heritage resources, visual quality, resource features, recreation and forage and associated plant communities. For each of these key values there is variability in the approach to regulation – for example, how desired outcomes are expressed and the approach to identifying performance standards. Table 10 below summarizes the variability in FRPA elements by forest value, and highlights the three values that are specifically assessed in this research. Each of the elements of regulation are described in the sections that follow.

TABLE 10: SUMMARY OF FRPA REGULATORY ELEMENTS BY VALUE

FRPA Values	Objectives Defined by FRPA (FPPR)[1]	Objectives Enabled by FRPA (GAR)[2]	Quanti-tative Standards	Quali-tative Standards	Default Standards[3]	Licensee Result/ Strategy Required in FSP	Factors (Guidance) Provided for Result /Strategy[4]
1 Soils	✓			✓	✓	✓	✓
2 Wildlife	✓	✓	✓	✓		✓	
3 Bio-diversity	✓		✓		✓	✓ ✓	✓
4 Riparian areas	✓	✓		✓	✓	✓	✓
5 Water	✓	✓		✓	✓	✓	
6 Timber	✓			✓	✓	✓	✓
7 Cultural Heritage Resources	✓					✓	✓
8 Visual Quality		✓				✓	
9 Resource Features		✓				✓	
10 Recreation		✓					
11 Forage & Plant Commun-ities						✓	

1. Objectives defined within FRPA are identified in the Forest Planning and Practices Regulation (FPPR)
2. Objectives enabled by FRPA are identified in the Government Actions Regulation (GAR), except for recreation objectives which are enabled by the FRPA Act itself.
3. Default practices are provided in the FPPR for most environmental values; for timber, standards developed by the Chief Forester for seed use are provided as a default, with allowance for the approval of alternative practices.
4. Schedule 1 of the FPPR includes Factors to guide the identification of results and strategies for some values.

3.2.2 Characterization of Desired Outcomes

The FRPA statute does not include overarching goals for the legislation, as was the case with the preamble set out in the former Forest Practice Code[10]. However, government communication and implementation documents state that the FRPA framework maintains the same environmental standards as the FPC, and similarly seeks to find a balance in economic, social and environmental interests (MoF, 2004b; MoF, 2004c). The FRPA approach to articulating 'balance' is different than the FPC however, and is guided by three key considerations: 1) ensuring the sustainability of the timber supply; 2) providing adequate conservation and protection for non-timber resources and; 3) giving appropriate weight to the economic interests of tenure holders (Reader, 2006).

The FRPA relies upon the identification of 3 types of objectives[11], to identify the desired outcomes of forest management: 1) Objectives Set by Government within FRPA regulations that apply across the province[12]; 2) Land Use Objectives that are established by Government under the Land Act for individual sub-regions, landscapes or watersheds; and 3) Objectives Enabled by Government by FRPA regulations for site-specific areas and values.

Most of the objectives set within FRPA and enabled by FRPA are constrained by a requirement to not 'unduly reduce the supply of timber from British Columbia's forests." The FRPA legislation does not define what it means to 'unduly reduce the supply of timber' nor has this been subsequently interpreted or defined by the Courts. According to Reader (2006), the inclusion of this clause in each objective effectively compels tenure holders who are preparing Forest Stewardship Plans to identify results and strategies that minimize impacts to timber supply. In addition, the forest practice standards that are provided as default practices in the FRPA framework were originally designed under the FPC based on an assumption that they would not exceed a 6% impact to provincial timber supply levels (MoF,1996). Standards for wildlife habitat retention and old growth forest retention specifically are based on estimated maximum timber supply impact targets of 1% and 2.3% respectively (MoF,1996; MoF 2006).

[10] The FPC preamble identified goals for achieving sustainable use of BC's forests and balancing economic, social and ecological interests.
[11] There is a fourth category of objectives – those that were established under the former Forest Practices Code and grandfathered under Section 181 of FRPA. These objectives were typically developed through strategic land use planning and are usually consistent in nature with those now established under the Land Use Objectives Regulation.
[12] Except where a Land Use Objective is determined to be in conflict with a FRPA objective, then the former prevails.

Objectives Set by Government

The FRPA Forest Planning and Practices Regulation (FPPR) identifies objectives for seven of the eleven forest values that are central to FRPA: soils, timber, wildlife, riparian areas, water cultural heritage resources, and visual quality. These objectives apply to all areas approved in a Forest Stewardship Plan, unless they are specifically replaced by a land use objective that is determined to be conflicting.

Objectives set by government are high level and qualitative, and as previously noted, most are constrained by a requirement to not 'unduly reduce the supply of timber from BC's forests'. Table 11 summarizes the objectives set by government for the environmental values that are of specific interest to this research.

TABLE 11: OBJECTIVES SET BY GOVERNMENT IN FRPA FOR SELECTED ENVIRONMENTAL VALUES

Objectives set by government for soils **5** The objective set by government for soils is, without unduly reducing the supply of timber from British Columbia's forests, to conserve the productivity and the hydrologic function of soils.
Objectives set by government for wildlife **7** (1) The objective set by government for wildlife is**,** without unduly reducing the supply of timber from British Columbia's forests, to conserve sufficient wildlife habitat in terms of amount of area, distribution of areas and attributes of those areas, for (a) the survival of species at risk, (b) the survival of regionally important wildlife, and (c) the winter survival of specified ungulate species.
Objectives set by government for water, fish, wildlife and biodiversity within riparian areas **8** The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.
Objectives set by government for wildlife and biodiversity – landscape level **9** The objective set by government for wildlife and biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia's forests and to the extent practicable, to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.
Objectives set by government for wildlife and biodiversity – stand level **9.1** The objective set by government for wildlife and biodiversity at the stand level is, without unduly reducing the supply of timber from British Columbia's forests, to retain wildlife trees.

Source: BC Forest Planning and Practices Regulation, Sections 5 - 9

Land Use Objectives

The FRPA framework also provides for the establishment of land use objectives under the BC Land Act[13] for specified geographic areas. It has typically been used by government to establish objectives that reflect land use direction contained within regional and sub-regional strategic land use plans[14]. These land use plans are highly variable in content, but generally identify large zones such as protected areas, special management zones, or value-specific zones (e.g. wildlife habitat, cedar, visually sensitive areas) and general management zones, and associated land use objectives and strategies or performance measures. Establishment of the objectives (or some combination of objectives & measures) and zones under the Land Act provides a legal mechanism for compelling forest tenure holders to ensure their Forest Stewardship Plans are consistent with land use plan direction. Land use objectives have also been established at a landscape scale, usually to provide direction for the retention of old forest ecosystems.

The establishment of land use objectives is not as tightly constrained by the requirement to not 'unduly impact timber supply' as the FRPA objectives. Instead the criteria for establishment include ensuring they provide for an appropriate balance of social, economic and environmental benefits, and that their importance outweighs any adverse impact on opportunities for timber harvesting[15]. However, it is also worthy of note that there are provisions in FRPA to allow for exemptions from land use objectives[16], if they are deemed to have an adverse impact on delivered wood costs or duly constrain the ability of a tenure holder to exercise his/her rights.

Table 12 below provides examples of Land Use Objectives for selected environmental values of interest to this research. It is important to note the high degree of variability that exists in the specificity of these objectives. Some land use objectives are very high level and provide ample flexibility for licensees to determine site level practices, such as the following example: "*prevent or minimize the effects of development activities on fish populations and fish habitat*". Other objectives can be so prescriptive as to be more appropriately characterized as mandatory

[13] Section 93.4 to 93.7 of the BC Land Act and the associated Land Use Objectives Regulation provide authority for the Minister responsible for the Land Act to establish Land Use objectives that provide direction for forest practices pursuant to the Forest and Range Practices Act

[14] This includes regional Land Use Plans developed under the guidance of the Commission on Resources and the Environment, and subsequent sub-regional Land and Resource Management Plans. Plans were typically developed through multi-stakeholder planning processes.

[15] BC Land Act, Land Use Objectives Regulation, Sections 2 (2) (a) and (b).

[16] Section 25 of the FPPR grants the Minister responsible for the Land Act the authority to exempt a tenure holder from the requirement to develop results and strategies that are consistent with land use objectives, if it is determined that this would have a material adverse impact on delivered wood costs, or would unduly constrain the tenure holder's ability to exercise their rights under the tenure agreement.

practice requirements, such as the following: *"Adjacent to high value fish habitat, maintain a reserve zone with a width, on average of 1.5 times the height of the dominant trees, and do not alter or harvest the forest in the reserve zone unless there is no practicable alternative".*

TABLE 12: SELECTED LAND USE OBJECTIVES FOR ENVIRONMENTAL VALUES

Land Use Objectives	**Riparian Objectives**	**Landscape Biodiversity (Old Seral Forest) Objectives**
North and Central Coast Land Use Order	"*Adjacent to high value fish habitat, maintain a reserve zone with a width, on average of 1.5 times the height of the dominant trees, and do not alter or harvest the forest in the reserve zone unless there is no practicable alternative*"	Specifies old growth retention requirements for each ecosystem type (site series or surrogate) within each landscape unit ranging from 30 to 70% of the natural range of variation (averages 50% overall)
	"*Adjacent to S1 to S3 streams (for non-high value fish habitat) retain 90% of the functional riparian forest in management zones with a width, on average, of 1.5 times the height of the dominant trees*".	
West Kootenay Boundary Land Use Plan Order	Provides additional streamside management measures for small (S5 and S6) streams located within watersheds used to supply drinking water.	Specifies old and mature forest retention targets for each ecosystem type (BEC variant) in each landscape unit.
Kalum LRMP Land Use Order	*"Prevent or minimize the effects of development activities on fish populations and fish habitat".* *"Manage resource development activities to minimize negative impacts on surface and ground water quality for flora, fauna, domestic, commercial and industrial users".* *"Manage human activities to maintain hydrological stability"*	"*Maintain a range of seral stages across the landscape to meet the needs of a wide variety of species".* *"It is recommended to the statutory decision maker to maintain old growth forest attributes through the designation of old growth management areas (OGMAs) across the landscape*". (Note OGMA's were subsequently established through a separate order).

Objectives Enabled by Government

The third type of objectives provided for in the FRPA regime are those that can be enabled by government for specified site-specific or landscape level values. The Government Actions Regulation (GAR) provides the authority for the designation of geographic areas and objectives for values such as wildlife habitat, community watersheds, scenic areas, lakeshore management zones and specific 'resource features' such as cultural heritage and recreation sites and trails. However, there is limited application of this tool due to restrictive measures that are designed to limit 'undue impacts' to timber supply. The regulation itself includes a requirement to demonstrate that there are no undue impacts to timber supply, and that the public benefit of establishing an order outweighs any potential increases in delivered wood costs to tenure holders. The establishment of Wildlife Habitat Areas under GAR is specifically restricted by government policy to not exceed 1% impact to the timber harvesting land base (MoF, 2006).

3.2.3 Characterization of Performance Standards

The FRPA framework includes a variety of approaches to performance standards, including quantitative standards, qualitative standards, and default standards. For some values and objectives there are also mandatory practice requirements. A summary of the different types of performances standards that are provided under FRPA for the selected environmental values of interest to this research is outlined in Table 13 below and summarized in the ensuing sections.

Quantitative Performance Standards

Quantitative performance standards include statements of measurable amounts or quantities to be achieved. There are two values for which FRPA provides quantitative performance standards - considered to be supplemental legal direction for objectives set by FRPA in regulation - the conservation of wildlife habitat and retention of old growth forest[17]. For both of these values, individual legal tools are used to compel forest licensees to protect a precise amount of area required from harvesting in order to meet government's objectives for biodiversity and wildlife.

[17] And as previously noted, some land use objectives include quantitative performance standards within the objectives themselves.

TABLE 13: SUMMARY OF OBJECTIVES AND PERFORMANCE STANDARDS UNDER FRPA

Value	Objectives Set by Govt (FPPR Section)	Objectives Enabled by Govt (GAR Section)	Quantitative Performance Standards (Compliance with result is mandatory)	Qualitative Performance Standards (FPPR Section) (Compliance with result is mandatory)	Default Performance Standards (FPPR Section) (Licensees must undertake to comply or propose alternative results or strategies for approval)	Mandatory Practice Requirements (FPPR Section) (Compliance with practice is mandatory)
Soils	5: Conserve the productivity and hydrological function of soils		N/A	37: Must not cause landslides 38: Must not cause gully processes 39: Must maintain natural surface drainage	35: Soil disturbance must not exceed 5% for sensitive soils, 10% for non-sensitive soils and 25% for roadside work areas. 36: Permanent Access Structures must not exceed 7% of a cutblock	40: Must revegetate soils within 2 years of construction or deactivation of roads
Wildlife -	7: Conserve sufficient wildlife habitat for survival of species at risk, regionally important species, and specified ungulates	9-13: General Wildlife Measures; Wildlife Habitat Areas; Wildlife Habitat Features; Ungulate Winter Ranges; Species at Risk	Section 7 Notices indicating the amount, attributes and distribution of wildlife habitat to be protected within each Forest District	70(2): Must ensure primary forest activity does not damage wildlife habitat feature.		69: Must comply with general wildlife measures
Biodi-versity	9 and 9.1: Design areas to resemble natural disturbance patterns at the landscape level and retain wildlife trees at stand level		Provincial Non-Spatial Old Growth Order – specifies old seral retention targets for ecosystems within each landscape unit		64: Max cutblock sizes (40 and 60 hectares) with exemptions. 65: Must not harvest stands adjacent to cutblocks until specified green-up is achieved, with exemptions 66:Must retain a minimum of 7% of cutblock area in wildlife trees over 1 year, and 3.5% of every cutblock. 67: Must not harvest wildlife trees until cutblock has reached mature seral condition.	68: Must retain coarse woody debris-minimum 4 logs per hectare each a minimum of 5 metres (coast) / 2 metres (interior) in length and 30 cm (coast) / 7.5 cm (interior) in diameter at one end.
Riparian areas (Fish, Water & Wildlife Habitat)	8: Conserve across landscape, water quality, fish habitat, wildlife habitat, and biodiversity associated with riparian areas	6: Lakeshore Management Zones 15. Temperature Sensitive Streams		54:Must not cause fan destabilization on the Coast 55: Stream crossings must be located, built and used in a manner that a) protects the stream channel and stream bank immediately above and below the crossing, and; b) mitigates disturbance to the stream channel and stream bank at the crossing 56: Must be no material adverse effect on fish passage in a fish stream (exceptions for temporary effects) 57: Must conduct forest activities at a time and in a manner that is unlikely to harm fish or destroy, damage or harmfully alter fish habitat.	47: Stream riparian classes and widths 48: Wetland riparian classes and widths 49: Lake riparian classes and widths 50(1) No roads in a riparian management area (exceptions provided) 51(1) (3): No harvesting or silviculture treatments in a riparian reserve zone 52(2): Must retain enough trees within a riparian management zone for S4, S5 and S6 streams to maintain the stream bank or channel integrity where there are defined downstream values 53: Must maintain streamside trees or understory vegetation to maintain shade to temperature sensitive streams.	50(2): Road maintenance prohibited beyond width of road in an RMA 50(3) Must not remove gravel from within an RMA (exceptions provided) 52(1): Basal area retention requirements for riparian management zones (for minor tenure holders). 58: Restrictions on the use of livestock in riparian areas

For FRPA Objective 7 (conserve wildlife habitat for species at risk, regionally important wildlife and specified ungulates), an official 'Notice' was provided to tenure holders by the Ministry of Environment to define the amount, attributes and distribution of wildlife habitat to be protected by tenures holders within their operating area (the amount reflecting government's impact policy of 1% maximum timber harvesting land base). The Notice does not specify boundaries for these 'Wildlife Habitat Areas', but instead defines the attributes and requires tenure holder to identify the precise areas, and 'results and strategies' that will be used to achieve this objective within their Forest Stewardship Plan (FSP).

For old growth forest, a *Provincial Non-Spatial Old Growth Order* (BC MSRM, 2004) was established under the Land Act (1996), creating a Land Use Objective that defines the amount of old forest to be retained by ecosystem type in landscape units across the province[18]. The order effectively applies to all landscape units unless or until there are more detailed or spatial old growth objectives established for individual landscape units. Tenure holders must define 'results or strategies' in their FSP for achieving old growth objectives, either through the spatial identification of old growth management areas or simply by committing to retain the required amount of area.

Qualitative Performance Standards

Qualitative performance standards define the *quality* of a desired outcome, ideally in a manner that is verifiable. There are a few examples of mandatory qualitative performance standards for environmental values found within FRPA[19], notably for values and practices that carry a higher level of risk (White, 2005). These are summarized in Table 13 above, and illustrated in full text in the examples provided below related to soils and riparian areas.

1) An authorized person who carries out a primary forest activity must ensure that the primary forest activity does not cause a landslide that has a material adverse effect in relation to one or more of the subjects listed in section 149 (1) of the Act. (FPPR Section 37)

2) An authorized person who carries out a primary forest activity on the Coast must ensure that the primary forest activity does not cause fan destabilization that has a material adverse effect in relation to one or more of the subjects listed in section 149 (1) of the Act. (FPPR Section 54)

[18] Ecosystem are defined by Biogeoclimatic Ecosystem Variants, and targets range from 3 to 28%, depending upon the ecosystem and biodiversity emphasis.
[19] These are defined as mandatory practice requirements under FRPA, but they actually define desired outcomes or results rather than required practices, and so are characterized here as qualitative performance standards.

3) An authorized person who builds a stream crossing as part of a road, a temporary access structure or permanent access structure must locate, build and use the crossing in a manner that
(a) protects the stream channel and stream bank immediately above and below the stream crossing, and
(b) mitigates disturbance to the stream channel and stream bank at the crossing.
(FPPR, Section 55)

4) (1) An authorized person who carries out a primary forest activity must ensure that the primary forest activity does not have a material adverse effect on fish passage in a fish stream.
(2) An authorized person who maintains a fish stream crossing built after June 15, 1995, must ensure that the crossing does not have a material adverse effect on fish passage.
(3) Despite subsections (1) and (2), an authorized person may temporarily allow a material adverse effect on fish passage to construct, maintain or deactivate a road, including a stream crossing, if
(a) fish are not migrating or spawning, and
(b) the source of the material adverse effect is removed immediately on completion of the construction, maintenance or deactivation. (FPPR, Section 57)

With these qualitative performance standards, licensees are responsible for determining the practices they will use to achieve the stated results but do not have to specify their intended practices to the government. Failure to achieve the specified standard can result in punitive measures if detected and enforced by the government, discussed further in section 3.2.4.

Default Standards

FRPA relies significantly on the use of default standards to define acceptable practices or performance standards for environmental values. These default practice requirements, as they are referred to under FRPA, commonly reflect the same practices that were formerly mandated under the Forest Practices Code. Under FRPA however, licensees are provided the option of complying with these practices or proposing alternative practices in the form of results or strategies if they can demonstrate the consistency of their alternatives with the FRPA objectives.

Table 13 summarizes several default practice requirements that are provided for the management of soils, biodiversity and riparian areas. They are typically quantitative in nature, defining for example maximum soil disturbance limits, maximum cutblock size, minimum requirements for wildlife tree retention, and minimum buffer sizes for the retention of trees within riparian areas.

There are also a couple of default practice requirements that are expressed qualitatively – one of which is outlined below, related to riparian management practices.

> An authorized person who fells, modifies or removes trees in a riparian management area adjacent to a temperature sensitive stream, or a stream that is a direct tributary to a temperature sensitive stream, must retain either or both of the following in an amount sufficient to prevent the temperature of the temperature sensitive stream from increasing to an extent that would have a material adverse impact on fish:
>
> (a) streamside trees whose crowns provide shade to the stream;
> (b) understory vegetation that provides shade to the stream.

It is unclear to the author why a qualitative standard such as the above, that provides ample flexibility in the choice of practices in itself, would be expressed as a 'default practice'.

Mandatory Practice Requirements

Finally, there are a few examples of mandatory practice requirements within FRPA. These are very specific requirements for specific practices that are more consistent with a prescriptive, practices-based approach to regulation than to performance-based management. Examples include a requirement to revegetate soils within two years of construction or deactivation of a road and restrictions on building livestock corrals within a riparian area.

3.2.4 Licensee Requirements

Under FRPA, forest tenure holders are required to submit one operational plan to government for approval – a Forest Stewardship Plan (FSP) for their entire licensed operating area. There are three key components to an FSP:

1) A map showing the boundaries of all forest development units in their operating area;
2) *Results and strategies they intend to apply to achieve government's objectives; and,*
3) Conformance to specific prescribed requirements for the FSP.

The Act specifically requires licensees to identify results and strategies that are consistent[20] with any of the three types of objectives set or enabled by FRPA. Results and strategies are defined in the FPPR (1) as follows:

> **"result"** means a description of (a) measurable or verifiable outcomes in respect of a particular established objective, and (b) the situations or circumstances that determine where in a forest development unit the outcomes under paragraph (a) will be applied;

[20] The term consistent is not defined under FRPA. *Black's Law Dictionary* provides the following definitions for consistent: 'to be in agreement with' 'in harmony with' or 'compatible with'.

> **"strategy"** means a description of (a) measurable or verifiable steps or practices that will be carried out in order to meet a particular established objective, and (b) the situations or circumstances that determine where in a forest development unit the steps or practices will be applied; (emphasis added)

The terms 'measurable' and 'verifiable' are defined in an administrative guidance document (BC MoFR, 2009, 136):

> **"Measurability"** is usually considered a *quantitative* measure. Generally speaking, something is measurable when an outcome can be compared to an empirical set of data in order to determine if the outcome has been achieved.
> **"Verifiability"** is normally considered a *qualitative* measure. Something is verifiable where there are either steps in a process and/or an end results that can be proven through examination or demonstrated to have occurred.

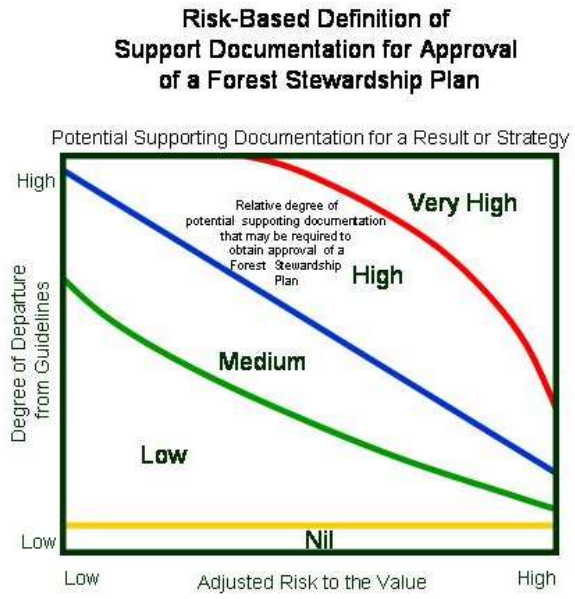
The FPPR further compels licensees to either undertake to comply with the default practice requirements specified in the regulation as their intended results and strategies, or to identify alternative results or strategies for approval by government.

Typically with performance-based regulation, it is the regulator who specifies the desired outcomes and the regulated entity determines the practices they will apply to meet the results. Under FRPA, forest licensees are provided the option of *either* specifying results *or* strategies in respect of government's objectives. This may be due to the fact that many of the objectives set by FRPA for key values are written at a very high level, without measurable or verifiable outcomes included within the objectives or separately as performance standards. Using riparian habitat as an example – the objective set by FRPA is to conserve water quality, fish habitat, wildlife habitat and biodiversity in riparian areas, without unduly impacting timber supply. There are no measurable or verifiable outcomes within this objective. There are a few measurable outcomes identified as 'practice requirements', namely for stream crossings and fish passage. But for the most part riparian management standards are defined instead by default practice requirements specifying for example reserve zone widths and acceptable practices within riparian areas. Licensees can choose to comply with these default practices, identify alternative practices, or identify results they intend to achieve for riparian areas.

The FPPR (Schedule 1) also includes factors that were considered by the government in formulating the default forest practices. Licensees are advised to consider these Factors when they are developing results and strategies, in particular as alternatives to the defaults provided in

FRPA. Licensees are also advised by way of administrative guidance (BC MoFR, 2009), that the degree of proof and documentation required to support approval for their alternative results and strategies depends upon the degree to which their approach departs from guidelines or default practices, and the potential risk to forest values (Figure 3). The greater the departure from default practices, and the greater the risk and potential consequence of a negative outcome (e.g. threats to human safety or a critical environmental objectives) the greater the onus on licensees to supply documentation on the rationale for their approach, risk evaluation and approach to risk management (BC MoFR, 2009).

FIGURE 3: RISK FRAMEWORK FOR FSP APPROVAL



3.2.5 Performance Assessment

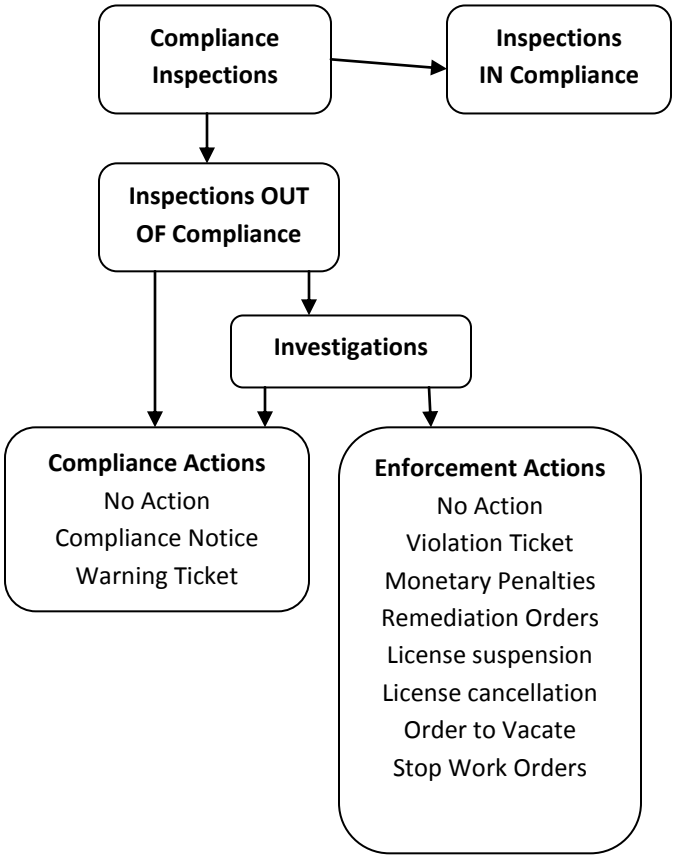
To encourage licensee compliance, the FRPA framework includes provisions for the government to monitor licensee performance and to enforce instances of noncompliance. Compliance monitoring is undertaken through two different means:

1) Compliance and Enforcement (C&E) staff within the Ministry of Forests and Range (MoFR) staff are responsible for monitoring licensee compliance with FRPA and associated regulations;

2) An independent agency - the Forest Practices Board - is responsible for undertaking randomly selected audits of forest practices, and responding to public complaints and inquiries.

The MoFR's compliance and enforcement framework is outlined schematically in Figure 4 below. Compliance inspections form the foundation for the program. The Ministry applies a risk-based approach to compliance monitoring. C&E staff rate all field activities – including harvesting, road building, silviculture, range and recreation – for their potential level of environmental, social or economic risk. Activities deemed to have a high or very high risk are prioritized for field inspection (FPB, 2008).

FIGURE 4: MOFR COMPLIANCE AND ENFORCEMENT FRAMEWORK



According to MoFR's Annual C&E Reports, the number of annual compliance inspections ranged between 14,500 and 17,000 for the five fiscal years between 2004/05 and 2008/2009

(since the FRPA came into force). For the five years prior (1999/2000 to 2003/2004) the level of compliance monitoring under the former Forest Practices Code was significantly greater, with an average of 25,615 annual inspections[21]. What these inspection levels represent in terms of the proportion of all active operations, or even just high risk operations, is not discernible from published reports.

Where compliance inspections identify a contravention that is fairly minor in nature, compliance actions such as compliance notices or warning tickets may result. Where alleged contraventions are more severe, investigations are undertaken, and can result in enforcement actions that include violation tickets, monetary penalties, remediation orders, stop work orders, license suspensions or cancellations, and orders to vacate. Monetary penalties can range from $1,000 to $500,000 depending upon the nature and severity of the contravention. License holders who receive enforcement actions are reported in the MoFR Annual C&E Reports.

Between 2004 and 2009, the average rate of compliance determined from annual inspections was 92.9%. The average annual number of compliance and enforcement actions undertaken were 2,407 and 466 respectively, and the average annual amount of monetary penalties levied was $258,254[22].

Compliance monitoring is also undertaken by the Forest Practices Board – BC's independent 'watchdog' for forest and range practices. The FPB undertakes random field audits and special investigation of forest and range practices, to provide the public with an independent assessment of licensee compliance and government enforcement of FRPA. The FPB does not have authority to administer penalties for contraventions it finds. Instead it relies upon public reporting of its audit and investigation findings and recommendations to encourage improvements in performance.

The BC provincial government also undertakes effectiveness monitoring of the FRPA framework, through its multi-agency Forest and Range Evaluation Program (FREP). The primary purpose of this program is to assess the effectiveness of the FRPA framework in

[21] Compiled from Annual Compliance and Enforcement Reports for the fiscal years between 1999/2000 to 2008/09, located at: http://www.for.gov.bc.ca/hen/reports/index.htm

[22] Compiled from Annual Compliance and Enforcement Reports for fiscal years 2004/05, 2005/06, 2006/07, 2007/08 and 2008/09.

achieving stewardship of the eleven resource values identified in the legislation and identify key issues affecting these values.

3.2.6 Professional Reliance

An element of central importance to the FRPA regime is that of professional reliance- defined as:

> *"The practice of accepting and relying upon the decisions and advice of professionals who accept responsibility and can be held accountable for the decisions they make and the advice they give". (ABCFP, 2008)*

The FRPA framework institutes a significant shift from a reliance on government staff to review and ensure the quality of operational plans, and uphold the role of 'forest steward' more generally, to a reliance upon forest professionals employed by tenure holders. Under the FPC, government staff used to engage in detailed review and discussion of proposed operational plans (in particular for five year development plans outlining proposed cutblocks and roads) with licensees before recommending approval to the Statutory Decision Maker (SDM). SDM's were required not only to ensure that operational plans met legal requirements, but also to consider whether the plans 'adequately managed and conserved' forest resources[23]. The latter test conferred broad authority to SDM's to consider issues and values of specific local significance might not be reflected in the legislative framework.

Under FRPA, the role of plan preparers, government reviewers and SDM's has changed. As noted earlier in this chapter, there is now only one operational plan submitted for approval by government – the Forest Stewardship Plan. The qualified professional who prepares the plan has ultimate accountability for it and, with it, the role of 'forest steward' (Reader, 2006). The reviewing professional in government has a role in ensuring the plan meets legal requirements and is professionally supportable. However, the reviewing professional is not expected to review the plan in any detail, but rather to ask probing questions to ensure the prescribing professional has the documentation and rationale necessary to support their work. The SDM, if satisfied that the plan meets the legal requirements specified under Section 5 of FRPA, is essentially obligated to approve it. SDM's do not have the same level of discretion they did under the FPC

[23] Forest Practices Code, Section 41(b) (Act now repealed)

to require or compel tenure holders to undertake alternative practices or other variances to FRPA in the interest of 'adequately managing and conserving forest resources'[24].

Reader (2006) suggests that perhaps the greatest challenges presented by the professional reliance model embedded within FRPA are:

- The willingness of major tenure holders to assume many of the stewardship responsibilities traditionally shouldered by government officials; and
- The ability of the resource management professions commonly relied upon by tenure holders to gain and maintain the confidence not only of tenure holders, but also of the public and the government.

Indeed a public opinion poll undertaken by the Association of BC Forest Professionals (ABCFP, 2009) indicates the reality of that challenge, with 51% of British Columbians stating that they are not satisfied with forest management in BC, and 42% opining that the quality of forest management has decreased in the last five years. However, the poll also indicated that respondents have a higher degree of trust in forest professionals providing information about BC's forests than any other group, including government, academia, tenure holders, environmental groups and journalists.

3.3 Summary

The preceding chapter has outlines the elements of the FRPA framework, and illustrated how is not purely performance-based regulation. The FPRA framework embodies a complex mixture of regulatory approaches, and might best be considered as part way down the spectrum towards performance-based management.

In theory, a performance-based approach would include clear statements of desired outcomes for each value that are measurable or verifiable, and flexibility for licensees to determine the practices that would best achieve the stated outcomes. The FRPA framework by comparison, relies primarily on very high level objectives set by FPRA, that are in some cases supplemented

[24] In their *Special Report: A Review of the Early Forest Stewardship Plans under FRPA* (2006), the Forest Practices Board identified this as an item of concern, and recommended that "consideration could be given to amending the FSP content requirements and approval tests to afford delegated decision makers a higher degree of professional capability to consider variances or place conditions on the approval of FSPs".

or replaced by more detailed regionally specific land use objectives, as well as limited application of site specific objectives. Increased specificity and in some cases measurability for desired outcomes is then provided through performance standards, which are variably expressed for each value through either quantitative, qualitative or default performance standards.

Measurable quantitative performance standards are provided for two valued components[25] (old growth forest and habitat for species at risk). There is some matter of debate among scholars and practitioners as to the 'consistency' of mandatory quantitative standards such as these with a performance-based approach to regulation. Certainly most theorists agree that defined measurable outcomes are essential to ensuring the effectiveness of a performance-based regulatory regime. However, the ability to define measurable outcomes while still affording flexibility in the choice of practices or approach to achieve them can be very difficult to achieve in practice. The performance standards provided for old growth retention and species at risk, with their precise requirements for the amount of habitat to be retained – may be better characterized as mandatory practice requirements.

MacKinnon (2005) contends that the FRPA approach to biodiversity management for example is not results-based and does not allow for innovation in practices, because it does not define measurable desired outcomes for biodiversity. It defines a broad objective to design harvest areas to resemble patterns of natural disturbance, and compels licensees to maintain specified amounts of old forest that reflect a policy goal of limiting the impacts of biodiversity management to roughly 3% of timber supply. A more results-based approach, he argues, would include the identification of true desired outcomes for biodiversity such as 'no reductions in species and ecosystem diversity as a result of management practices' (or perhaps an allowance for specified or temporary reduction), and the identification of species that could be used as good indicators for monitoring the effectiveness of forest practices in achieving these outcomes.

For a few values, qualitative standards are provided (e.g. soils – must not cause landslides and fish – must be no material adverse effect on fish) that are arguably consistent with a

[25] While the FRPA framework identifies 11 forest values, there are often several attributes or components associated with each value for which specific forest practices are designed. For example, old growth retention is just one component of biodiversity, and fish habitat is one component of riparian areas. These are therefore referred to as 'valued components'.

performance-based approach to regulation. They provided verifiable statements of desired outcomes, for which licensees are required to determine the practices that are consistent with these outcomes.

For most environmental values, the FRPA framework relies upon the use of 'default forest practices' to provide an indication of acceptable performance standards. Licensees have the option of undertaking to comply with the default practices or to propose alternatives, if they can demonstrate that their alternatives are *consistent* with government's objectives. However, since many of government's objectives are high level statements that do not include measurable or verifiable desired outcomes, (e.g. conserve the water quality, fish habitat, wildlife habitat and biodiversity associated with riparian areas) the test for consistency is focused more on the degree of departure a proposed alternative is from a default practice that is believed to be consistent with government objectives, than it is on the likelihood of the alternative practice achieving a measurable outcome.

This is an area of concern noted by the Forest Practices Board, who recommended strengthening FRPA objectives "by including statements of the standards to be achieved and the criteria of measurement that will indicate what the government believes to be successful achievement" (BCFPB,2006,4). While the Board indicated their support for a results-based approach to forestry, and suggested that "the application of a results-based model in British Columbia is a major innovation with the potential to become a world leading system of forestry regulation" (BCFPB,2006,3), they also identified a few areas where they recommended regulatory refinements in the interest of improving public support and understanding, and enabling effective government enforcement. In addition to strengthening government objectives, they recommended revisions to the framework to allow for regional variances in the priority of values, increased discretion for statutory decision-makers to balance values and issues of specific local importance, and revisions to FSP's to make them a more effective tool for communication and stewardship (BCFPB, 2006).

As noted earlier, one of the stated goals of implementing a performance-based regulatory framework was to provide industry with the freedom to manage in delivery of defined results and open the door to innovation in forest practices (while still maintaining the environmental standards that were embodied in the former FPC). While the FRPA framework is not purely

performance-based, it does seemingly accord greater flexibility to forest licensees to define forest practices for key environmental values and provide an opportunity for innovation in practices. The next chapters in this thesis will evaluate how forest licensees have responded to the FRPA framework in its early days of implementation, whether there are indications that the framework is likely to foster innovation in forest practices, and explore reasons why or why not.

CHAPTER 4: THE POTENTIAL FOR INNOVATION INDICATED IN FOREST STEWARDSHIP PLANS

Forest Stewardship Plans (FSP's) can provide an early indication of the possibility for innovation, and licensees' potential willingness to test innovative approaches. If licensees opt to undertake the default practices wherever these are provided and to identify practices that are consistent with the requirements of the former FPC where there are no defaults, then it is likely that there will be little innovation in practices on the ground. Conversely, where licensees opt to identify alternative practices in their FSP, this may indicate the possibility for innovation in practices and the supporting rationale for the alternative practices could illustrate the degree of innovation proposed.

To evaluate the potential for innovative forest practices, a review of the first 65 FSP's approved by government as of March 15, 2007 was undertaken between March and July of 2007. As outlined in greater detail in Chapter One, all 65 FSP's were reviewed for the purpose of assessing licensee response to the FRPA framework and to identify indications of the potential for innovative forest practices with respect to the management of three FRPA values - soils, biodiversity, and riparian areas. For each of these values, the forest practice commitments made by licensees in the form of 'results and strategies' were reviewed and documented. A web-based survey (Appendix One) was then sent to the prescribing foresters who developed and are accountable for each of the 65 FSP's, for the purpose of eliciting an understanding of the rationale behind their choice of practices and their willingness to innovate. Four FSP's were subsequently selected as case studies, and phone interviews (Appendix Three) were undertaken with both the prescribing forester who prepared the plan and the statutory decision-maker who approved the plan, to elicit further, more detailed information.

The purpose of this chapter is to characterize the forest practice commitments made by licensees for the FRPA values of soils, biodiversity and riparian areas, as made evident in a review of approved FSP's and in the survey and phone interviews with prescribing foresters. Chapter Five will then explore the factors influencing licensees' initial responses to the FRPA framework and their willingness to innovate.

4.1 Forest Practice Commitments for Soils, Biodiversity and Riparian Areas

A review of the first 65 FSP's approved as of March 15, 2007 indicated that overall, there was relatively little intent to implement alternative and innovative forest practices for soils, biodiversity and riparian areas. Only twenty FSP's included some level of commitment to alternative forest practices for these three values. On average, 78% of forest practice commitments across all 65 FSP's reflected a choice of default practices, with an additional 8% reflecting a minor modification to the default practices. An average of 4% of forest practices reflected requirements arising from legal land use objectives. Commitments to implement alternative forest practices (results and /or strategies) that might indicate the possibility for innovation were reflected in 10% of forest practice commitments in FSP's.

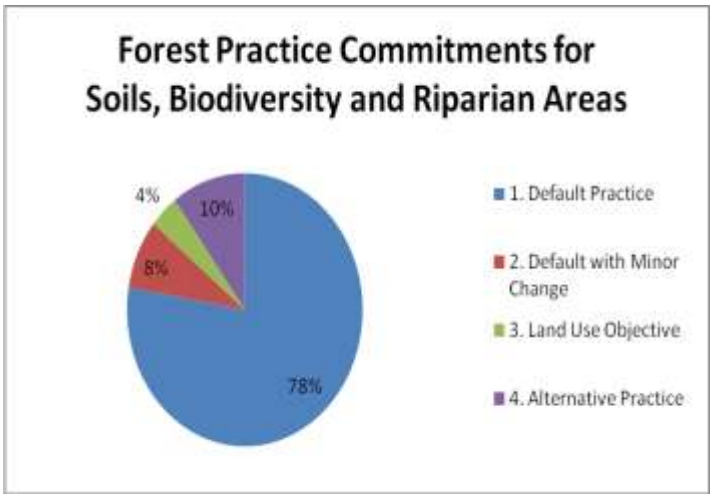
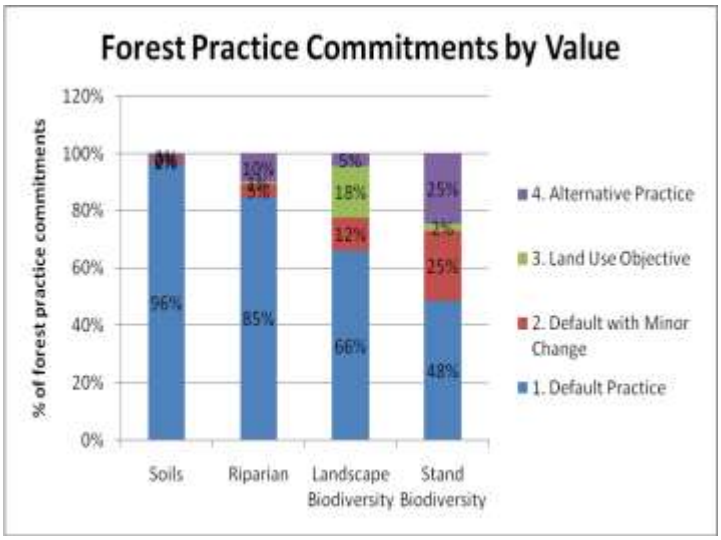


FIGURE 5: FOREST PRACTICE COMMITMENTS FOR SOILS, BIODIVERSITY AND RIPARIAN AREAS COMBINED



Examining each value individually, the greatest proportion of alternative practices was identified for stand level biodiversity (25%), followed by riparian areas (10%). Practices for soils and landscape level biodiversity reflected alternative practices in only 2% and 5% of cases respectively.

FIGURE 6: FOREST PRACTICE COMMITMENTS FOR SOILS, BIODIVERSITY AND RIPARIAN AREAS INDIVIDUALLY

For the alternative forest practices that were specified in FSP's, survey respondents provided their perception of the degree of innovation in each practice on a scale of 1 (not innovative) to 5 (very innovative). On average, the alternative practices were perceived to be 'moderately innovative' (3), with the greatest degree of innovation perceived in practices for soils, followed by stand level biodiversity and riparian management (Figure 7). There is variability in licensee response for each of the three values, explored in greater detail in the following sections.

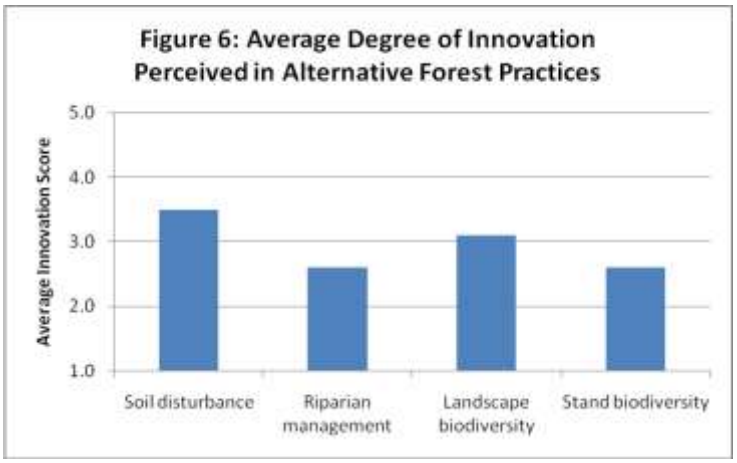


FIGURE 7: AVERAGE DEGREE OF INNOVATION PERCEIVED IN ALTERNATIVE FOREST PRACTICES

4.1.1 Soils

Productive soils provide the fundamental foundation for productive forest ecosystems, and in turn sustainable forest management. The FRPA objective for soils is to conserve the productivity and hydrologic function of soils (without unduly reducing the supply of timber from BC's forests). More specific desired outcomes relative to soils are defined in the Forest Planning and Practices Regulation (FPPR), in the form of three mandatory, qualitative performance standards that prohibit licensees from causing landslides (S.37) and gully processes (S. 38), and require the maintenance of natural surface drainage patterns (S. 39), for which licensees do not have to specify their intended practices. In addition, there are two default performance standards that specify maximum limits for soil disturbance (S. 35) and permanent access structures (S. 36) within cutblocks, for which licensees are obligated to specify the results and strategies they intend to undertake within their FSP.

As illustrated in Figure 8 below, the vast majority of FSP's (92%) opted to comply with the default practices for soil disturbance specified in section 35 of the FPPR. An additional 3% of FSP's identified what were essentially minor modifications to the default practices. The few exceptions to this (5%) were to propose alternatives that allow for increased soil disturbance in order to regenerate deciduous species. 100% of FSP's undertook to comply with the default practices for permanent access (S. 36).

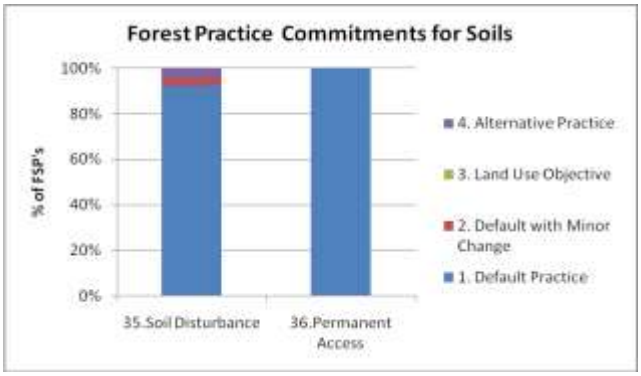


FIGURE 8: FOREST PRACTICE COMMITMENTS FOR SOILS

For the three plans that identified alternative practices for soil disturbance, the prescribing foresters described their alternative practices as moderately innovative and innovative, reflecting scores of 3 and 4 respectively on a scale of 1 (not innovative) to 5 (very innovative).

4.1.3 Biodiversity

Biodiversity is defined under FRPA as "the biological diversity of plants, animals and other living organisms in all their forms and levels of organization, including the biological diversity of genes, species and ecosystems" (FPPR, Section 1). The FRPA framework provides objectives for biodiversity at two geographic scales - landscape level and stand level. For landscape level biodiversity, there are two different types of objectives. A land use objective under the Land Act – *the Provincial Non-Spatial Old Growth Order* – compels licensees to maintain a defined amount of old forest for each ecosystem type within each landscape unit across the province. For some areas of the province, this order has been replaced by individual landscape unit objectives that spatially identify Old Growth Management Areas to meet these targets. Licensees are obligated to commit within their FSP's to complying with established land use objectives for old growth that are relevant to their operating area. None of the 65 FSP's indicated any additional commitments for old growth retention beyond the established objectives.

The FPPR provides a second objective for landscape biodiversity - 'to design areas on which timber harvesting is to be carried out that resemble both spatially and temporally, the patterns of natural disturbance on the landscape (without unduly reducing the supply of timber from BC's forests). Default performance standards provided in Section 45 of the FPPR provide licensees the option of implementing specified maximum cutblock sizes (40 hectares on the Coast and 60 hectares in the Interior) or identifying an alternative cutblock sizes that are "designed to be

consistent with the structural characteristics and temporal and spatial distribution of an opening that would result from a natural disturbance" (FPPR S.45). Section 46 defines default adjacency requirements – the minimum height of regeneration (green-up) that must be attained in a cutblock before an adjacent stand can be harvested.

The FPPR also includes a stand level biodiversity objective to retain wildlife trees (without unduly reducing the supply of timber from BC's forests). Default performance standards identify a minimum amount of area to be retained within cutblocks to achieve this objective (S.66)[26] and prohibit harvesting wildlife trees until the cutblock has reached mature seral condition (S.67). Requirements for the retention of coarse woody debris – another element of stand level biodiversity – are expressed as mandatory practice requirements in which minimum amounts of CWD are mandated, rather than expressed as a default (FPPR S.68).

As illustrated in Figure 9 below, there was relatively little commitment in FSP's to alternative practices for landscape level biodiversity – only 5% of FSP's (three plans) identified alternative practices for cutblock size and adjacency. 69% of FSP's undertook to comply with default practices for cutblock size, and an additional 9% proposed slight modifications to the default practice, while 63% committed to default practices for adjacency requirements, and an additional 14% to defaults with slight modifications. 17% of FSP's committed to alternative cutblock sizes and 18% for adjacency requirements consistent with land use objectives for biodiversity that have been established within their tenure area.

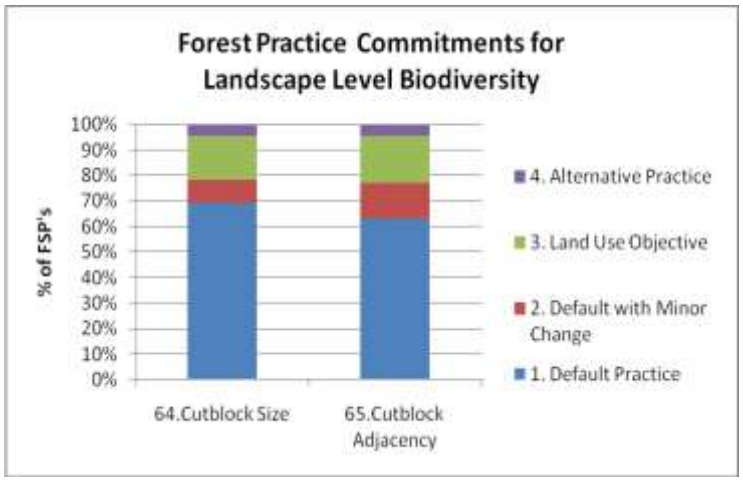


FIGURE 9: FOREST PRACTICE COMMITMENTS FOR LANDSCAPE LEVEL BIODIVERSITY

It is important to recall however that the default standard for cutblock size itself actually allows for considerable flexibility in application; licensees can manage to the maximum cutblock sizes

[26] Section 66 of the FPPR defines minimum wildlife tree retention levels as 3.5% per cutblock and 7% over 1 year for all cutblocks

identified or identify alternatives based on an assessment of natural disturbance patterns. Therefore, there may not be a lot of incentive to identify alternative practices.
One of the three FSP's that committed to alternative practices identified an exemption from the default practices for cutblock size for stands that are at a high risk of infestation from mountain pine beetle. Two FSP's identified an allowance for cutblocks larger than the default size where there is a risk of the stands not being available at a future date due to the senescence of alder or time restrictions on the license (these are tenures that are focused on the harvesting of hardwoods).

When asked what they perceived to be the degree of innovation in their proposed alternative practices for landscape level biodiversity, survey respondents indicated perceptions ranging from somewhat innovative to very innovative (Figure 10), with a median and average response of moderately innovative.

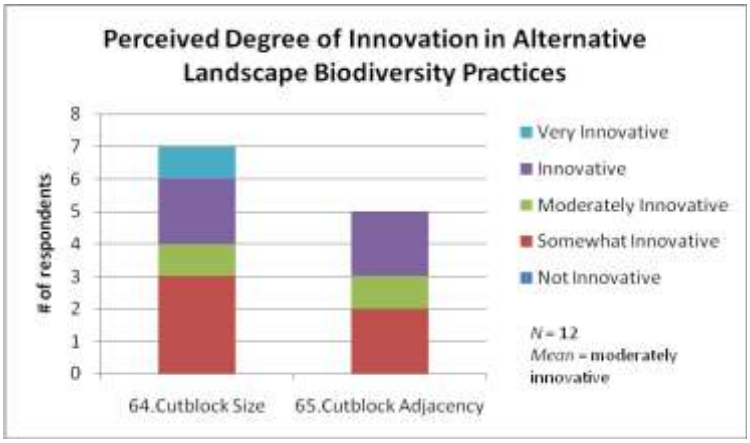


FIGURE 10: PERCEIVED DEGREE OF INNOVATION IN ALTERNATIVE LANDSCAPE BIODIVERSITY PRACTICES

It is worthy of note that although only 3 FSP's committed to undertake alternative practices for cutlbock size, seven survey respondents identified their practices as alternative and provided a rating of the degree of innovation. This is likely because, as previously noted, the default practice for cutblock size allows for a significant degree of flexibility in application. However the FSP's do not provide any description of the intended practices where there is a commitment to undertake to comply with the default, so it is not possible for the author to independently consider the level of innovation for these practices.

Stand level biodiversity practice commitments reflected the greatest number of alternative practices. As illustrated in Figure 11 below, 42% of FSP's committed to undertake default wildlife tree retention practices, 22% identified only minor changes to the default practices and 3% of FSP's identified practices arising from land use objectives. 34% of FSP's identified alternative results or strategies for wildlife tree retention. With respect to restrictions for wildlife tree harvesting, 55% committed to the default practices, 28% identified minor changes to the

default practices, 2% reflected land use objectives and 15% proposed alternative results or strategies.

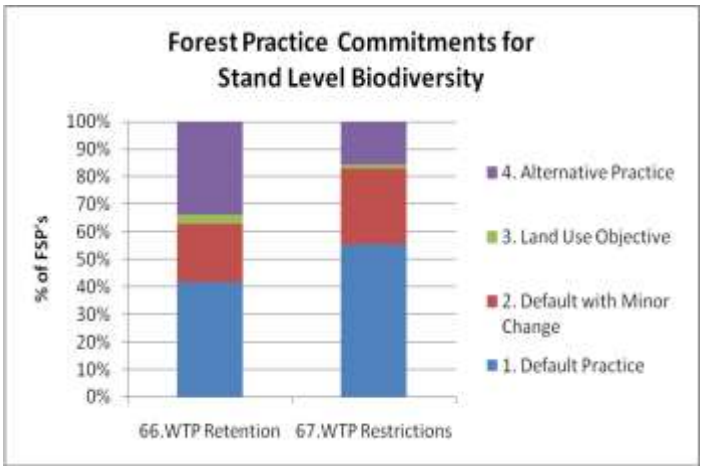


FIGURE 11: FOREST PRACTICE COMMITMENTS FOR STAND LEVEL BIODIVERSITY

Alternative practices identified for wildlife tree retention were examined in closer detail, and are summarized in Table 14 below, in two categories. The first category reflects alternative practices that reflect a refinement to the application of the default standard – generally to either create greater flexibility in application of the retention targets (e.g. by extending the timeframe for tracking targets) or specifying situations where targets should be reduced or not applicable. The second category of alternative strategies reflects alternative approaches to determining the target levels of wildlife tree retention.

TABLE 14: EXAMPLES OF ALTERNATIVE RESULTS/STRATEGIES FOR WILDLIFE TREE RETENTION

Approach	Description / Examples
1. Amendments to the default practice requirement	▪ Revising the cutblock level retention target (3.5% of cutblock area) to apply only to cutblocks greater than 10 or 15 hectares ▪ Revising the annual wildlife tree retention target (7% of all cutblocks harvested in a calendar year) to require achievement of this target for each cutting permit, over a 5 year term, over the life of the plan, or over all cutblocks harvested within a forest license instead of a calendar year. ▪ Specifying that wildlife tree retention targets do not apply where selection or patch cut silviculture systems are applied. ▪ Allowing for retention targets to be reduced where suitable wildlife tree attributes do not exist (i.e. pure lodgepole pine stands) or where there is a forest health risk.
2. Alternative approaches to setting targets for wildlife tree	▪ Several licensees committed to alternative targets for wildlife tree retention that were identified for each biogeoclimatic subzone within each landscape unit (targets ranged from 0 to 13%), consistent with procedures outlined in the (1995) FPC Biodiversity Guidebook, and in some cases reflected in District policies and subregional land use plans.

Approach	Description / Examples
retention.	▪ Several licensees included a requirement that the maximum distance between wildlife tree patches (WTP's) and the edge of the cutblock is no more than 500 metres, in addition to the target amounts of retention. ▪ Once licensee specified only the requirement for a maximum distance between WTP's and cutblock edge of 500 metres, and did not specify target amounts of retention. ▪ One licensee (reflected in 4 FSP's) committed to retain >or = 7% of cutblock area in WTP's for areas that are > or = 250 metres away from already constrained areas. Cutblock areas that are within 250 metres of an already constrained area require > or = 0% retention.

In the author's opinion, the alternative stand level biodiversity practices are better characterized as alternatives that provide increased flexibility or refinement to the default approach (in some cases to reduce target levels of retention), rather than innovative practices. Survey respondents who developed the alternative stand level biodiversity practices however, on average perceive their alternative practices as moderately innovative (Figure 12).

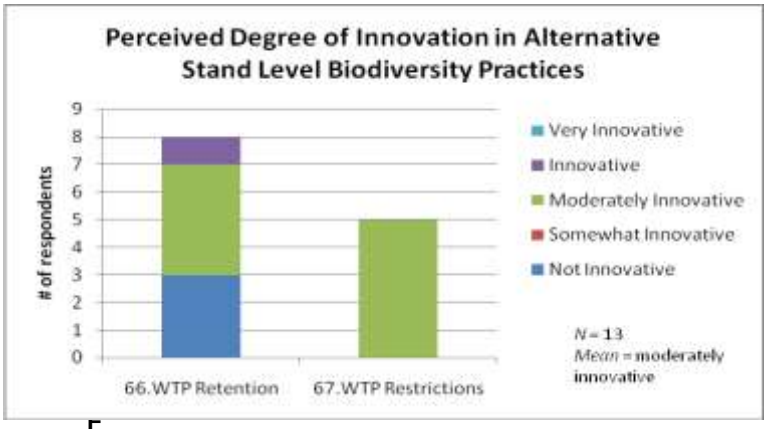


FIGURE 12: PERCEIVED DEGREE OF INNOVATION IN ALTERNATIVE STAND LEVEL BIODIVERSITY PRACTICES

4.1.2 Riparian Areas

Riparian areas are defined as the area located next to the banks of streams, lakes and wetlands that include both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it[27]. Riparian ecosystems are considered to be of particular importance in forest management because they support a high concentration of environmental values and services. Riparian forests help to maintain the integrity of stream channels, and in turn the quality of water. Riparian trees provide both a vital source of nutrients from leaf and twig litter, and a source of shade important for fish. And riparian ecosystems are known to provide a high diversity of plant and animal species, and important travel corridors for

[27] Forest Practices Code Riparian Area Management Guide (1995). Retrieved 18 March 2011 from: http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/riparian/Ripar1.htm

wildlife[28]. They are also typically the most productive forest ecosystems, and hence the most valuable for timber production.

The objective set by government within FRPA for water, fish, wildlife and biodiversity within riparian areas is to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas (without unduly reducing the supply of timber from BC's forests) (FPPR, Section 8). The Government Action Regulation (GAR) further enables the establishment of additional objectives related to geographically specific riparian areas – for lakeshore management zones, community watersheds, fisheries sensitive watersheds and temperature sensitive streams, although as previously noted its application is limited by tests that restrict impacts to timber. The FRPA framework then identifies a number of qualitative performance standards that define outcomes that must be achieved (e.g. maintain fish passage) and default performance standards that identify acceptable results or strategies for riparian management areas – including the identification of riparian reserve zones in which harvesting is prohibited, and practice requirements to be applied within riparian management zones (see Table 12 in chapter 4).

On average across all of the practices for which default performance standards are provided, 83% of FSP's adopted default practice requirements, and an additional 5% accepted the default practices with minor changes or exceptions (Figure 13). 1% of licensees reflected riparian management practices arising from land use objectives. 10% of licensees identified alternative riparian management practices on average for all components of riparian management.

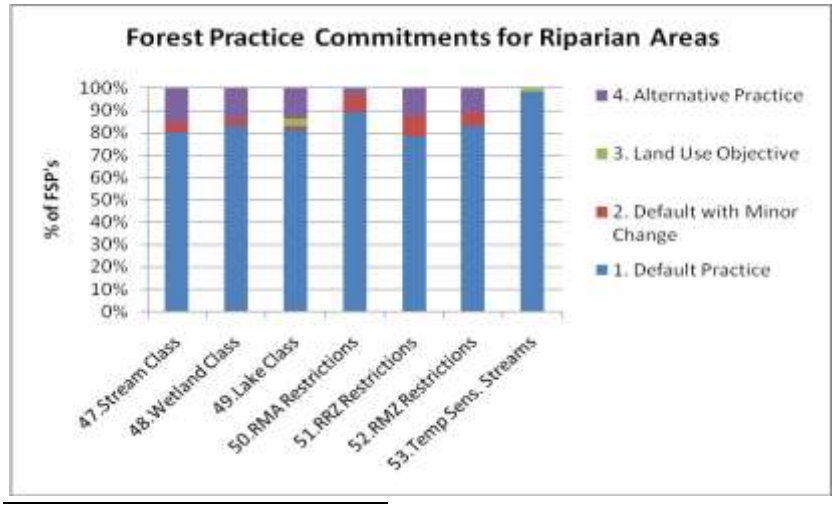


FIGURE 13: FOREST PRACTICE COMMITMENTS FOR RIPARIAN AREAS

[28] Ibid.

With respect to riparian reserve zones alone, 15% of FSP's (10 plans – 5 of which are associated with one company) identified alternative practices for the retention of riparian reserve zones. 9 of these plans committed to implementing either the default practices OR an alternative that will be specified in a site plan or written rationale. 7 of the plans also committed to reserving the same net amount of area in reserve zones as would be achieved by the FRPA default practices, either at a watershed level (5 plans), cutblock level (1 plan) or Timber Sale Area (1 plan). One plan committed to the default practices plus additional retention consistent with the local Land and Resource Management Plan. The remaining 2 plans did not make any commitments regarding the intended size of reserve zones or amount of retention in reserve zones, except that they must not be less than 50% of the default width. Table 15 below summarizes the riparian reserve zone practices identified in the 10 FSP's that committed to alternatives.

TABLE 15: SUMMARY OF ALTERNATIVE PRACTICES IDENTIFIED FOR RIPARIAN RESERVE ZONES

1. (5 FSP's)	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths as specified in a rationale that is consistent with the factors described in FPPR Schedule 1 s.2. Overall there will be no net change in riparian retention at a watershed level relative to default reserve zones (plus or minus 10%) over the term of the FSP or every five years. Allowance for spacing and thinning in a riparian reserve zone (removal does not affect watershed retention targets) where desired to improve riparian habitat structure and ability of trees to contribute to stream channel stability.
2	Will implement the default practices for riparian reserves zones for streams OR will identify alternative RRZ widths if a qualified professional determines that a different width is more practicable and identifies an alternative that reflects the Factors listed in FPPR Schedule 1 s. 2. The new RRZ must not be less than 50% of the default width.
3	Will implement the default practices for riparian reserves zones for streams OR an alternative reserve width described in a site plan that has an area of not less than the sum of the areas calculated by multiplying the minimum width for each default riparian class (streams, lakes and wetlands) in the cutblock by the length of the stream in the cutblock or length of the shoreline of the wetland or lake in the cutblock. Riparian reserve zones will be distributed in a practicable manner, having regard to the factors identified in FPPR Schedule 1 s.2, and will not exceed the width of the applicable riparian management area.
4	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths in a written rationale signed by a qualified professional, that will provide for the equivalent amount of reserve zone (and RMA and RMZ) within the gross area of the Timber Sale license. Any increase or decrease in riparian reserve would maintain or increase the effectiveness and/or functioning of the riparian reserve, (based on identified circumstances) and will be in consistent with the Factors in Schedule 1 s.2 of the FPPR.

5	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths in a written rationale signed by a qualified professional. Any increase or decrease in riparian reserve would maintain or increase the effectiveness and/or functioning of the riparian reserve, (based on identified circumstances) and will be in consistent with the Factors in Schedule 1 s.2 of the FPPR.
6	Will comply with the default practices for riparian reserves, and in addition will demonstrate consistency with the Okanagan-Shuswap LRMP by electing to implement additional retention within reserve and management zones as outlined in the FSP. (Note: these LRMP objectives are not legal – policy only)

When asked how innovative their alternative approaches to riparian practices, respondents provided an average response of moderately innovative (Figure 14). Statutory decision-makers interviewed for the case studies further suggested that the best examples of the potential for innovation that they have seen proposed under the FPRA framework were riparian practices, as summarized by examples 1 and 2 in Table 14 above.

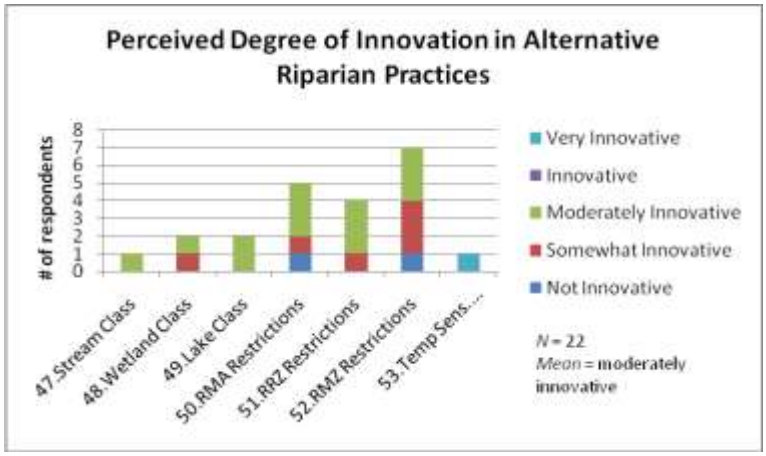


FIGURE 14: PERCEIVED DEGREE OF INNOVATION IN ALTERNATIVE RIPARIAN PRACTICES

For riparian management zones (RMZ's), there are no default performance standards provided under FRPA. There are mandatory practice requirements for minor tenure holders[29] that dictate a minimum percentage of basal area that must be retained within RMZ's, for each stream classification (S. 52(1)). For major tenure holders (all FSP's reviewed for this research) a qualitative performance standard is provided only for a subset of S4 to S6 streams (streams that do not have reserve zones specified in the default practices) that have defined characteristics[30].

[29] A minor tenure is defined as a free use permit, Christmas tree permit, occupant license to cuts or a forestry license to cut that is not a major licensee and limits the area from which timber may be harvested to 1 hectare and the volume of timber to be harvested to 2,000 m3 or less.

[30] (2) An authorized person who cuts, modifies or removes trees in a riparian management zone for an S4, S5 or S6 stream that has trees that contribute significantly to the maintenance of stream bank or channel stability must retain enough trees adjacent to the stream to maintain the stream bank or channel stability, if the stream
(a) is a direct tributary to an S1, S2 or S3 stream, (b) flows directly into the ocean, at a point near to or where one or more of the following is located: (i) a herring spawning area; (ii) a shellfish bed; (iii) a saltwater marsh area; (iv) an aquaculture site;(v) a juvenile salmonid rearing area or an adult salmon holding area, or (c) flows directly into the ocean at a point near to the location of an area referred to in paragraph (b) and failure to maintain stream bank or channel stability will have a material adverse impact on that area.

For all other streams and for lakes and wetlands, tenure holders are obligated to identify results and strategies for riparian management zones without the guidance of a performance standard.

Of the 65 approved FSP's that were reviewed in this project, 22 (34%) committed to undertake practices that are essentially equivalent to the requirements identified for minor tenure holders. For the remaining 43 FSP's, RMZ practices can be categorized into three approaches, as outlined in Table 16 below.

TABLE 16: EXAMPLES OF DIFFERENT APPROACHES TO RIPARIAN MANAGEMENT ZONE PRACTICES

Approach	Description / Examples
i. No (or few) RMZ commitments – practices to be defined at a site level	▪ 18 FSP's (28%) did not specify commitments for retention within RMZ's, but instead committed to identifying RMZ practices prior to harvest, stating that the practices will be based on the factors outlined in Schedule 1 of the FPPR for the management of riparian areas. Some of these FSP's committed to hiring a professional to develop RMZ prescriptions. ▪ 3 FSP's identified commitments to retain some trees (e.g. 10 trees per 100 metres stream length in S4 stream RMZ's and non-merchantable trees within S5 and S6 RMZ's), but did not specify commitments for remaining riparian classes of streams, lakes and wetlands.
ii. Targets for RMZ retention defined by riparian class	▪ 6 FSP's specified commitments for retention within riparian management zones by riparian class, expressed as either % of basal area to be retained (3), % of trees (1), % of RMZ area to be greater than 20 years old (1) or % of pre-harvest stand (1). ▪ 2 FSP's identified actual target levels of basal area retention (m2/ha) to be retained within RMZ's, while 1 FSP specified a target number of stems/ ha to be retained within RMZ's, by riparian class. ▪ Targets for retention either reflect a minimum acceptable level (i.e. > or = 30%) or a range of acceptable conditions (ie. 0-30%).
iii. Targets for RMZ retention defined by riparian class and other criteria	▪ 13 FSP's identified commitments for retention within riparian management zones that vary based on riparian class and the risk of windthrow. Higher levels of retention are generally reflected along larger, fish-bearing streams, and in areas of moderate to high windthrow, while smaller, non-fish bearing streams and areas of low windthrow risk often reflect low or zero target levels for RMZ retention. ▪ An additional 3 FSP's identified RMZ practices based on riparian class, risk of windthrow, and other criteria such as water quality objectives, temperature sensitive streams, critical wildlife habitat, stream order, valley bottom location and importance of woody debris/stream side trees. ▪ Retention targets are expressed as either % of basal area to be retained (10) or % of RMZ area to be retained (6).

For many FSP's it is not possible to assess the standards being proposed for RMZ management as they either identify a very wide range of acceptable levels of retention or do not commit to any

target or minimum level. It will only be possible to assess RMZ practices through monitoring and assessment of actual implementation in the field. There are a few FSP's that make express commitments to minimum levels of retention that exceed the practice requirements for minor tenure holders and these appear to be a reflection of commitments made for riparian management in the Okanagan-Shuswap LRMP area. There are also a couple of FSP's that identify minimum levels of retention that are lower than the requirements specified in 52(1).

On average, survey respondents believe that riparian management practices proposed under FRPA are *slightly innovative* and *slightly different* from those implemented under the Forest Practices Code (Figures 15 and 16 below).

FIGURE 15: PERCEIVED DEGREE OF INNOVATION IN RMZ PRACTICE COMMITMENTS

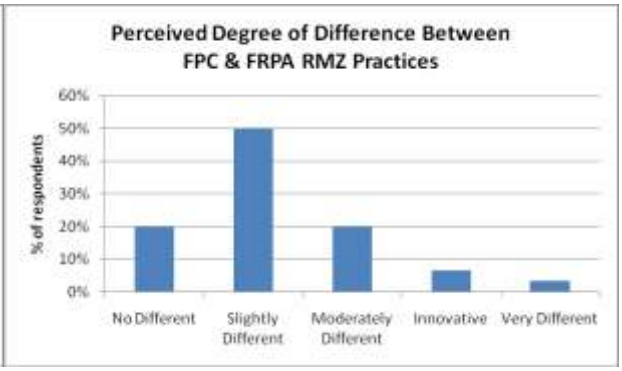


FIGURE 16: PERCEIVED DEGREE OF DIFFERENCE BETWEEN FPC & FRPA RMZ PRACTICES

4.2 Summary

A review of the first 65 FSP's approved pursuant to the Forest and Range Practices Act revealed that the vast majority of forest tenure holders have chosen to implement the default forest practices provided in regulation. Only 10% of forest practice commitments reflected an approach that is alternative to the default practice and, on average, those alternative practices are perceived by the prescribing foresters as being 'somewhat innovative'. In many cases, alternative forest practices may best be characterized as providing increased flexibility in application of default practices rather than being truly innovative practices.

For riparian management zones – a component for which FRPA does not provide default standards – forest practice commitments reflected somewhat greater variability. Roughly 34%

committed to implement the practice requirements specified for minor tenure holders. Another 33% identified alternative and somewhat innovative approaches to riparian zone management based on a range of site characteristics. The remaining 33% identified either very wide ranging targets or none at all and committed to developing RMZ practices on a site specific basis, making it impossible to evaluate the potential for innovation. Riparian zone management practices overall are perceived by the prescribing foresters as varying only slightly from the practices that were previously a requirement of the Forest Practice Code, and being slightly innovative.

Both the quantitative and qualitative responses provided by prescribing foresters in the surveys affirmed a dominant perception that there has been little in the way of innovative practices proposed or implemented under FRPA, as of the time of this research (2007). Respondents identified a number of reasons why they believe this to be so and these are explored in Chapter Five.

CHAPTER 5: FACTORS INFLUENCING LICENSEE WILLINGNESS TO INNOVATE

One of the stated goals for the Forest and Range Practices Act (FRPA) is to provide industry with the freedom to manage and to open the door to innovation in forest practices. The FRPA framework provides licensees the flexibility to define most forest practices, provided they are deemed to be consistent with government's objectives for forest management. For some values, the FRPA framework provides default forest practices, indicating acceptable performance standards that licensee may elect to implement or propose alternatives.

A review of practice commitments for soils, biodiversity and riparian areas in the first 65 Forest Stewardship Plans (FSP's) approved under the FRPA framework confirmed, however, that a majority of licensees chose to comply with default performance standards where these were provided, and to propose practices that were commonly implemented under the former FPC regime where there were no default standards. Alternative practices that were identified in FSP's are better characterized as revisions to default practices that provide greater flexibility in application at a site level rather than new or innovative practices.

It is of particular interest to this research to explore the reasons *why* there are few indications of alternative and innovative practices in these early FSP's. Prescribing foresters who developed the plans were asked a number of questions through a web survey and phone interviews, in order to elicit their rationale for the choice of forest practices and to identify values and perceptions that may be influencing their willingness to innovate.

When asked what the most important reasons were for their choice of default practices, licensees identified the following in order of priority: 1) a belief that the default practices are reasonably *effective*; 2) *certainty of FSP approval;* 3) *simplicity*; and, 4) *timelines* (Figure 17). By comparison, the most important reasons why licensees chose to commit to alternative forest practices where they did were: 1) to implement more *ecologically effective* practices; and, 2) to implement more cost-effective practices (Figure 18).

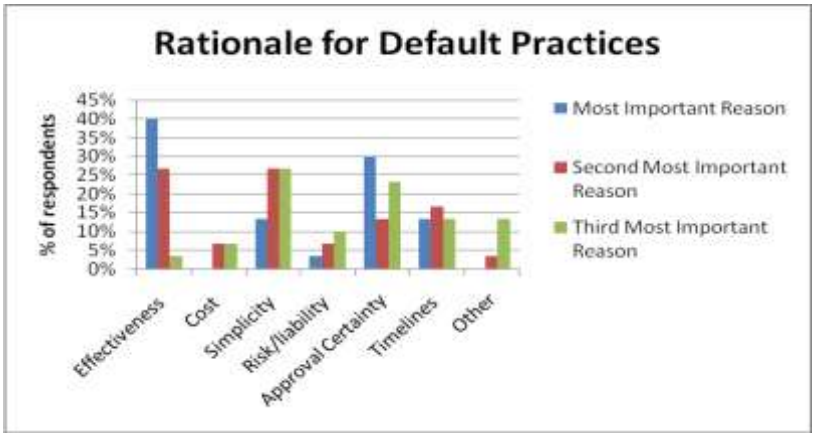


FIGURE 17: RATIONALE FOR DEFAULT PRACTICES

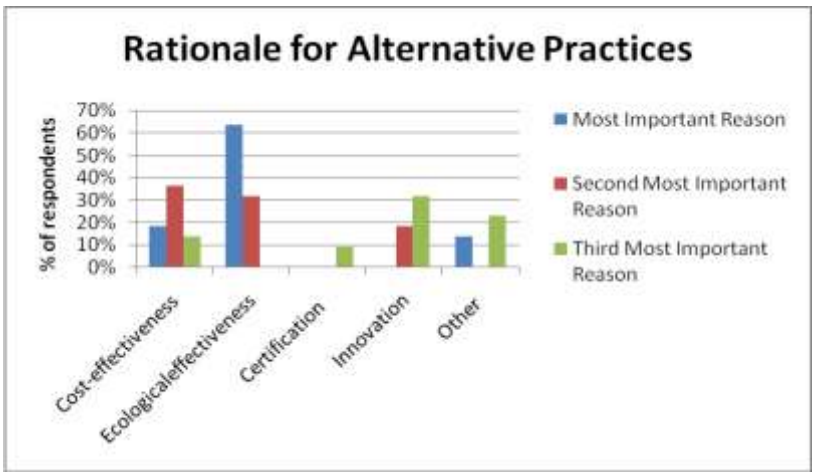


FIGURE 18: RATIONALE FOR ALTERNATIVE FOREST PRACTICES

Each of these factors will be explored in the sections that follow, along with a discussion of licensee perceptions of innovation and other perceptions and context that may be influencing the willingness of licensees to implement innovative forest practices under FRPA.

5.1 Perceptions of Innovation

Conceptually at least, there is clear support for the importance of innovation in forest management. Survey respondents agreed on average that the freedom to test innovative forest practices is key to long-term forest sustainability (Figure 19).

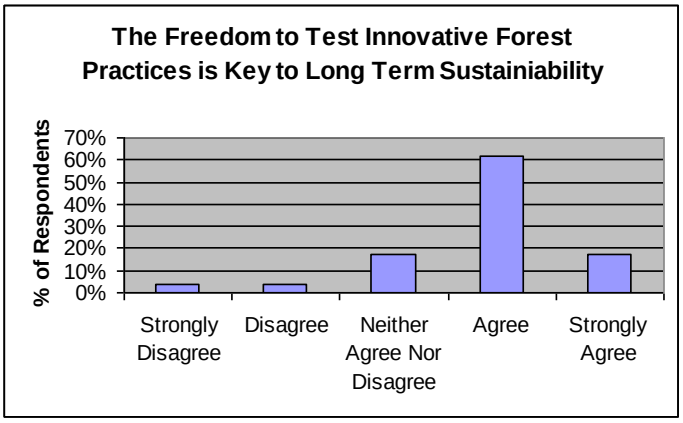
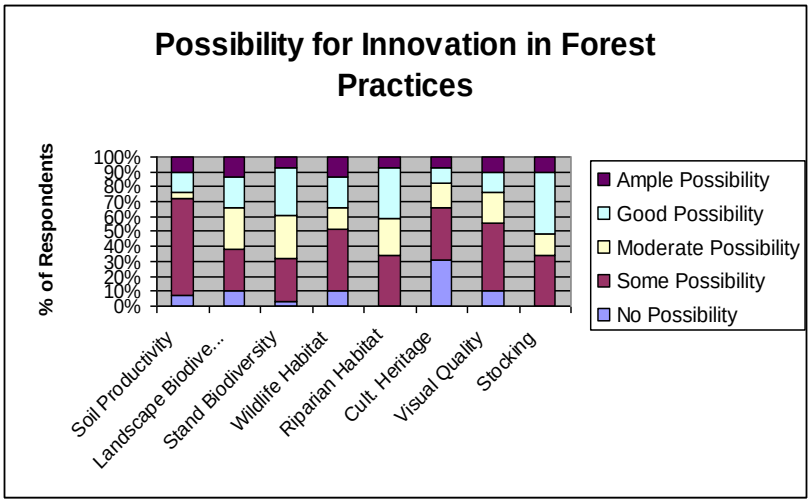


FIGURE 19: PERCEPTIONS OF THE IMPORTANCE OF INNOVATION

All respondents confirmed a belief in the importance of allowing for innovation in forest practices, and some offered the following reasons in support:

> *"Current forest management is an adaptive process – you never get better unless you allow for evolution of different management regimes".*
> *"Because the forest is dynamic and changes from one place to another, it's really important to allow for flexibility in practices at a site level".*
> *"It's essential with the kind of operating area that (my company) has - steep, broken, variable, small wood".*
> *"As our inventories and knowledge become better, it behooves us to fundamentally manage the resources better – innovation is key to this. Innovation is more likely to occur with a host of minds assessing how to achieve desired end results rather than just one mind".*

Prescribing foresters were further asked to indicate their perceptions of the 'possibility' for innovation in different types of forest practices in general, as well as the degree of 'opportunity' provided under FRPA to implement innovative practices. When asked about their perceptions about possibility for innovation. In general, survey respondents identified stocking standards / regeneration as an area of practice with the greatest possibility for innovation (good possibility). They perceived a moderate possibility for innovation in practices for managing riparian areas and landscape and stand level biodiversity, and just some possibility for innovation in practices for maintaining soil productivity, wildlife habitat, cultural heritage values and visual quality (Figure 20).

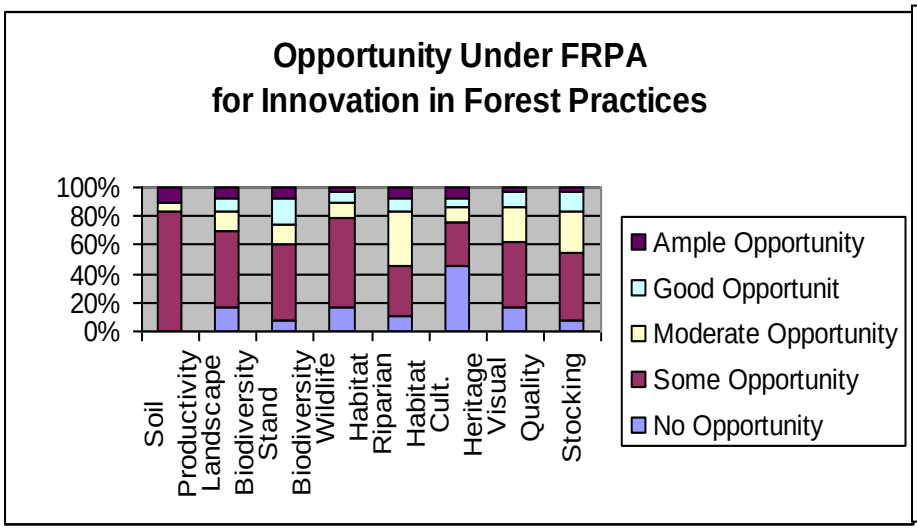


N = 29	Average	Median
Soil	**1.55**	**1**
Land Bio	**2.00**	**2**
Stand Bio	**2.11**	**2**
Habitat	**1.86**	**1**
Riparian	**2.14**	**2**
Cult. Her	**1.28**	**1**
Visual	**1.69**	**1**
Stocking	**2.28**	**3**

0 = No Possibility
1 = Some Possibility
2 = Moderate Possibility
3 = Good Possibility
4 = Ample Possibility

FIGURE 20: PERCEPTIONS OF THE POSSIBILITY FOR INNOVATION IN FOREST PRACTICES

In terms of the actual *opportunity* provided by FRPA for innovation in practices, respondents believe there is a moderate opportunity for innovation in riparian management practices, but only some opportunity for innovation in all other practices (Figure 21).



N = 29	Avg	Med
Soil	**1.38**	**1**
Land Bio	**1.38**	**1**
Stand Bio	**1.64**	**1**
Habitat	**1.17**	**1**
Riparian	**1.69**	**2**
Cult. Her	**1.00**	**1**
Visual	**1.38**	**1**
Stocking	**1.59**	**1**

0 = No Opportunity
1 = Some Opportunity
2 = Moderate Opportunity
3 = Good Opportunity
4 = Ample Opportunity

FIGURE 21: PERCEPTIONS OF THE OPPORTUNITY FOR INNOVATION PROVIDED BY FRPA

Respondents suggested that overall, FRPA provides for 'some' increase in professional freedom to innovate, but not a significant increase. These responses seem to suggest an overall perception that the possibility for innovation in practices exists for several forest values, but that the FRPA framework provides only limited opportunities to test innovative practices. The comments of one survey respondent illustrate this view:

"Although FRPA has opened the door to limited innovation, the licensees are still very restricted by Ministry policy as every R/S [result or strategy] etc. has to be approved by the MoFR"

One case study participant – a statutory decision maker – further suggested that it is difficult to define an innovative forest practice in the forest management context. He argues that all practices essentially reflect a balance between managing for environmental, social and economic values of forests and that the default practices represent a balance point considered acceptable by government. Innovation in this context, he suggests, means trying to find more cost-efficient and effective ways of achieving that same balance point, as opposed to trying to move the balance point (e.g. by focusing solely on finding cheaper practices).

5.2. Perceptions of Forest Management and the Effectiveness of Default Performance Standards

The number one reason prescribing foresters chose to commit to default forest practices was ***effectiveness*** – reflecting a belief that the default performance standards provided by FRPA are reasonably effective. The following comments from respondents reflect on this rationale:

"We felt that the available practice requirements would meet ecological needs and minimize impacts on our current business practices and processes. Creating a new alternate approach was not viewed as necessary to address local environmental conditions"

"For the most part, the foresters I wrote the plan for were comfortable with the obligations and opportunities provided in FRPA/FPPR. Where they wanted to be more innovative and practice outside what was allowed for in the regulations, I modified the practice requirements."

This perception is reconfirmed in the responses to another survey question, in which a majority of respondents indicated their belief that the practices required under the Forest Practices Code (which are largely the same as the default FRPA practices) have been generally effective in maintaining most environmental and social values (Table 17 below). However, they also believe that the FPC was less effective in maintaining economic values, a situation they suggest has been improved under FRPA.

Conversely, the main reason prescribing foresters chose to commit to alternative practices where they did, was '***to apply more ecologically appropriate or effective practices'***. For example, one respondent suggested that an alternative riparian reserve zone strategy to allow variation in reserve widths based on site conditions will provide better outcomes than the default

hard-wired reserve zones. A few other respondents similarly indicated a need to create additional flexibility to address site specific concerns, which the default practices did not provide. Another respondent noted that the default practices have been developed for coniferous species, and are not effective or appropriate for the management of short-lived deciduous species, which is why s/he opted to propose alternative forest practices.

TABLE 17: PERCEPTIONS OF THE EFFECTIVENESS OF FOREST PRACTICES UNDER THE CODE

	% Responses by Category						
Forest-Related Value	**Not Effective (0)**	**Slightly Effective (1)**	**Somewhat Effective (2)**	**Effective (3)**	**Very Effective (4)**	**Don't Know / No Opinion**	**Average Response (Scale of 0-4)**
Soil Productivity	0%	0%	10%	**59%**	28%	3%	**3.2**
Riparian Habitat	0%	7%	17%	**57%**	17%	3%	**2.9**
Water Quality	3%	13%	20%	**47%**	13%	3%	**2.6**
Wildlife Habitat	3%	10%	27%	**53%**	3%	3%	**2.4**
SAR Habitat	17%	13%	**33%**	30%	0%	7%	**1.8**
Lands. Biodiversity	13%	7%	**30%**	37%	3%	10%	**2.1**
Stand Biodiversity	0%	23%	**33%**	33%	7%	3%	**2.2**
Recreation	10%	3%	**53%**	20%	3%	10%	**2.0**
Visual Quality	7%	0%	17%	**60%**	10%	7%	**2.7**
Archaeology/ Cultural Heritage	3%	3%	3%	**63%**	17%	10%	**3.0**
Industry Competitiveness	50%	**10%**	27%	0%	3%	10%	**0.7**
Timber Supply	27%	**30%**	23%	10%	3%	7%	**1.3**
Community Stability	43%	**27%**	10%	7%	0%	13%	**0.8**

In summary, it can be concluded that effectiveness is first and foremost in the mind of prescribing foresters when determining the forest practices they intend to implement. The majority of respondents perceived the default standards to be reasonably effective and therefore opted to commit to their implementation. Where the default standards were perceived to provide insufficient flexibility to enable ecologically effective application at a site level, prescribing foresters chose to propose alternative practices.

5.3 Certainty of FSP Approval

The second most common reason prescribing foresters chose default performance standards was ***certainty of FSP approval***. Simplicity and timelines were also commonly identified, both of which were ultimately related to the need for certainty of FSP approval within the stated deadline. Several respondents alluded to a perceived difficulty in attaining approval from government for their FSP's if alternative practices were proposed. Given the timelines in which they had to prepare their FSP's, several respondents suggested that they focused on the simplest path to approval for their first FSP and would likely consider opportunities for innovation over the next several years. The following comments illustrate these sentiments:

> *"I believe that, in a time where innovative forest practices should be employed, a certain time constraint was first and foremost in tenure holders minds. Ensuring companies had an approvable FSP in order to continue operations was more important than developing innovative practices.*
> *"…the ability to employ or test new practices is limited by DDM [delegated decision maker] approval of alternative results and strategies. To date in the local area, licensees have avoided alternates as it is deemed to be a major roadblock to FSP approvals. As a result, the perceived benefits of professional freedom are not really available the way people would like to think they are as made available in FRPA".*
> *"pressure from statutory decision maker to do this/include that 'or else' [noted as a reason for the selection of default practices].*
> *"…and some [alternatives] are just not going to be approved by the DM [District Manager]. Interestingly, some DM's have approved our alternatives while other DM's are currently implying they will not approve them"*
> *"The reality of today is that plan preparers are first tasked with getting an FSP approved and then tasked with achieving gains in flexibility. Time constraints dictate that only the first goal can be achieved in most cases prior to the deadline for approval".*
> "*although 'default' or government established objectives were used for FSP approval, it is anticipated that 'one-off' amendments/variances will be required periodically*".

A theme that bears closer examination is the perception that the identification and approval of alternative practices is onerous and time consuming – an issue stated by several respondents, and reflected in the comments below:

> *"The time that it takes to back up innovative results and strategies in order to ensure they are measurable and approvable is considerable and thus, often this is a deterrent. I would hope that once the province has all of these operational plans in place, licensees will consider and develop more innovative R/S [results or strategies] to further the knowledge and understanding of the forests, ecosystems and resources around us."*
> *"In some cases, licensees have attempted to use innovation to lessen the degree of economic impact. These licensees have often had difficulty having their plans approved, as the burden of*

proof becomes quite onerous as soon as a licensee steps outside of the goalposts set by FRPA or existing policy (e.g. Higher Level Plans)."

For some respondents, the crux of the issue is a lack of ability or willingness of government reviewers and approvers to 'think outside the box' and accept some level of risk required to test innovative approaches, as reflected in the comments below:

"So far there has been a reluctance on the part of Ministry of Forest staff to rely on professionals and accept that there is always some level of risk associated with trying new and innovative practices".
"…the MoF DDMs [delegated decision makers] and crew cannot stop insisting on things being done their way".
"The non-default strategies have been watered down because MoF have very low risk tolerance and are not innovative about forest management. The amount of energy going into the process of auditing FSP compliance suggests that the MoF are not confident in the ability or ethics of industry professionals. Until this changes and the MoF stop trying to micro manage and second guess what is happening RPF's will not have the ability to be innovative and move BC forward into a progressive forest management culture".

A culture shift within the Ministry of Forests is what some respondents believe is central to addressing this issue, so that government plan reviewers gain a better appreciation and comfort with their new role under the professional reliance model that is central to FRPA and extend a greater level of trust to the prescribing foresters employed by licensees. Similar sentiments are noted by some respondents to a Professional Reliance Survey conducted in the fall of 2010 (BC MoFR, 2010b). The responses to this survey illustrated significant differences in perception between forest professionals employed by industry and those employed by government on many aspects of professional reliance, including whether it will lead to innovation in practices, reduced costs or increased stewardship of resources. One perception they did clearly share however, was disagreement with the statement that 'there is a high level of trust and good working relationship between professionals working for government and industry/consultants' (BC MoFR, 2010b).

A 'Culture Change and Team Building Session' put on by the Ministry of Forests and Range for all forest licensees and government staff in one forest district in early 2010 also indicates some level of support within government for these conclusions. The purpose of the session was to support increased understanding of the professional reliance model and the associated roles of government and industry forest professionals, to foster team building among the parties, and identify requirements for enabling innovation to occur. In a summary of the workshop, participants indicated an overall sense that professional reliance is not working as intended and

that the root cause is a lack of trust and relationship between industry and government. It was further suggested that, with increased trust and relationships to support the professional reliance model, there should be an increase in innovative thinking from all resource professionals and with it the possibility of further gains in efficiency (BC MoFR, 2010).

However, a lack of trust and aversion to risk on the part of government staff is not the only perspective on the root issue of alternative practices being onerous to define, rationalize and attain approval for. The following comment suggests another key issue:

> *"There is a lack of ability of MOFR staff to accurately evaluate risk to resources associated with prescribing anything outside of a default. To actually prescribe anything outside of a default, becomes onerous and time consuming, as there is no skill, knowledge or process to evaluate whether it is approvable".*

In the author's opinion, the lack of ability to evaluate risk associated with alternative forest practices is not necessarily associated with a lack of knowledge or skill of staff, but rather a reflection of the challenges inherent in the FRPA framework and the forest management context more broadly. For several values, the FRPA framework does not include a statement of desired outcomes that are measurable. And for many values, whether there are defined, measurable outcomes or not, our knowledge and understanding of the likelihood of identified practices achieving specified outcomes is low or at best imprecise. Stanbury and Vertinsky (1998) acknowledged this very issue in summarizing their conclusions as to why incentive-focused instruments were not widely used for environmental protection in the forest industry, despite their apparent widespread popularity at the time. They suggested this was because of the nature of the problem being confronted in the forest management context: 1) the overarching goal of sustainable forestry is not clearly defined and is difficult to define and measure; 2) the production function for sustainable forestry is highly uncertain - the state of knowledge of environmental benefit or damage as a result of activities is limited, as is knowledge of interdependencies among the regulated activities; and, 3) the precise means required to achieve goals are not always known and many behaviours may appear to be consistent with the goal.

A closer look at the management of riparian areas can illustrate this issue further. As previously noted, the objective set by government within FRPA for water, fish, wildlife and biodiversity within riparian areas is to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas (without unduly reducing timber

supply). There are no measurable outcomes identified to define what is meant by 'conserving' the values associated with riparian areas. Instead there are default standards that indicate practices that are deemed to be acceptable and consistent with this objective – in particular, a requirement for riparian reserve and management zones of a specified size for each class of stream, lake or wetland. While there is a significant body of science supporting an understanding that riparian forests provide critical functions in maintaining channel stability, riparian area functioning and wildlife habitat, there is no *definitive* science supporting the size of riparian reserve and management zones and practice requirements that are reflected in the default practices. While best available science was presumably considered in the identification of these riparian practices (under the Forest Practices Code), they ultimately reflect a social choice – in the desire to balance the risk to riparian values with the achievement of other forest values, such as timber harvesting opportunity.

For licensees to receive approval to implement alternative riparian practices, they must be able to demonstrate that their proposed alternative practice is 'consistent' with government's objective to conserve riparian area values. When proposing an innovative practice, they are also advised to identify the benefits and risks of the new practice and, where necessary, to carry out effectiveness monitoring to help reduce the risk of the new activity (BC MoFR, 2009).

Since government's objective for riparian areas is not measurable, and there is no *definitive* science to confirm the likely outcome of different riparian zone practices, and there are a myriad of other activities that can simultaneously affect riparian values other than forestry, it is extremely difficult to assess the risk or likelihood of success of a given alternative riparian strategy with much certainty. Government has therefore chosen to assess risk based on the degree to which an alternative practice differs from the default practice and to increase the burden of proof on licensees in accordance with its degree of departure from the default practice. Where there is little science or expert knowledge to support a rationale, licensees are compelled to develop a strategy for effectiveness monitoring - a potentially expensive venture.

In summary then, the lack of defined measurable outcomes combined with limited research and science in some areas of forest management ultimate create challenges for the effective evaluation and approval of alternative forest practices. In the absence of this information, forest licensees suggest that government ought to be more trusting and deferential of industry

professionals and government suggests that industry ought to put increased effort into assessing and managing the risk associated with proposed innovative practices, potentially through effectiveness monitoring.

5.4 Economic and Cost Considerations

While only a few respondents specifically selected **cost** as a reason for committing to default performance standards, many of the comments provided by survey respondents acknowledged the fundamental influence of cost considerations and the current economic context on their response to the FRPA framework. Further, the second most common reason cited for the selection of alternative practices selected was in fact ***'to implement more cost-effective practices'.***

Clearly, the economic condition of the forest industry in 2007, at the time of the survey and interviews, was dire. The comments provided by survey respondents regarding the effect of this economic context seem almost paradoxical at first glance – suggesting these conditions may both drive and limit innovation, as reflected below:

"FRPA hasn't really been a driver [for innovation]; current economic conditions are more of a driver – need to innovate to survive".
"Current markets and cost conditions may drive innovation today".

"Right now we're not seeing a lot of innovation given the current market conditions and energy required to develop the underpinnings for innovation. I'm expecting that we're going to see a bigger push for innovation in the future"
" [FRPA] hasn't been a driver [for innovation] in this first generation of plans, largely because of the tough state of the industry at the moment"
"…the shift to professional reliance, which in many cases means a shift in cost and liability to the industry, may not have occurred at the best time for the industry. The diminished financial health of the forest sector, compounded by rapid change and uncertainty reduces the impetus for innovation and ability for a company to justify the R/D [research and development] investment/added risk in developing innovative strategies. There are increasing job vacancies, high staff turnovers, large numbers of retirements, industry consolidations, large AAC impending reductions…. As a result of these compounding changes, forest professionals are taking on largely increased workloads and are needing to work smarter and much harder. Professionals are generally being asked to do more with less. In many cases this means not having the luxury of time to ponder and deliberate, discuss, and design and implement, and take on the added risk associated with proper adaptive management trials needed to fulfill the burden of proof for alternative strategies".
"I think only one of my licensees (out of 14) did some due diligence around exploring innovative practices. Everyone else basically chose the defaults, partly because of market issues, they couldn't afford the time".

What these comments suggest is that the economic context of the day did, indeed, have a significant influence on licensee's decision to commit to default practices rather than invest the time and resources required to support alternative approaches. Where alternatives were pursued, a main driver for innovation was to reduce costs or increase the cost-effectiveness of practices. But for most licensees, the adoption of the default practices was considered to be the most cost-effective approach.

Survey respondents also agreed, on average, that large forest companies are more likely to test innovative practices, presumably due to greater access to resources.

5.5 Perceptions of Risk and Liability

Survey respondents indicated a perception that professional liability has significantly increased and corporate liability has moderately increased under the results-based FRPA regime. Interestingly though, they did not perceive this increase in liability to have affected their willingness to innovate. Only a few respondents identified risk/liability as a reason for selecting default forest practices, and none offered comments to that effect.

5.6 The Influence of Certification

While it is beyond the scope of this research to fully evaluate the influence of forest certification schemes on forest practices, some limited conclusions can be drawn and compared with other such evaluative research in this area. A majority (68%) of respondents confirmed that their tenures were certified, either by the International Standards Organization (32% of respondents), the Canadian Standards Association (25%) or the Sustainable Forestry Initiative (21%)[31]. One interviewee (who was not a survey respondent) was certified by FSC. When asked "to what extent have certification requirements effected a change in forest practices for your company / tenure area, above and beyond the legal requirements of FRPA?" respondents provided a wide range of responses from none to significant (Figure 22), and an average response of 'moderate' for all three types of certification.

[31] The percentages for each certification scheme exceed 68% in total because 3 respondents indicated dual certification by ISO and and CSA and 1 indicated dual certification by ISO and SFI.

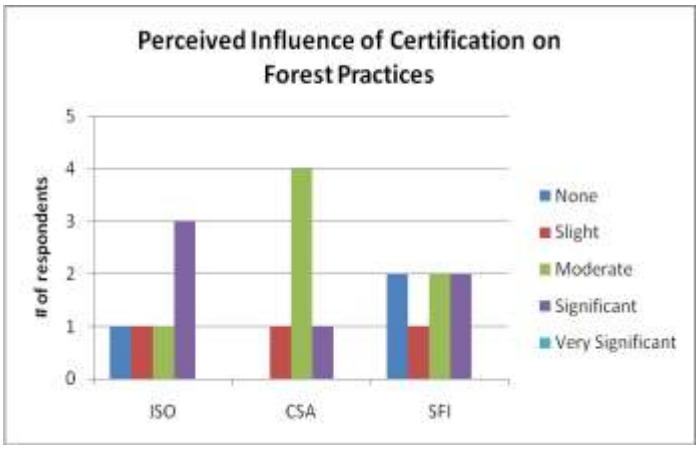


FIGURE 22: THE PERCEIVED INFLUENCE OF CERTIFICATION ON FOREST PRACTICES

However, only two survey respondents indicated that certification was among the three most important reasons they opted to identify alternative practices for soils, biodiversity or riparian areas. Additional comments provided by respondents indicated that most of the perceived influences of certification were related to administrative procedures, protocols or practices for values other than the three values that were the focus of this research. A couple of respondents with SFI certification noted that it had influenced their practices for species at risk, and further that a lack of strong government direction was resulting in increased pressure from the certifying bodies for improved practices for species at risk.

One of the case study participants indicated that certification was a primary driver for the development of alternative practices. This tenure holder also happens to be the only licensee included in this research (and indeed the only major tenure holder in BC) that is certified by the Forest Stewardship Council[32].

These results are fairly consistent with an analysis of seven forest management case studies in BC carried out by Tikina (2006), in which she concluded that there was some (but limited)

[32] This participant further suggested that FSP's may not be a good indicator of the degree of innovation in forest practices. Given their nature as contractual agreements with the government respecting practices that must be implemented and will be enforced, licensees tend to identify minimum acceptable requirements. Supplemental practices required to achieve certification will likely not be reflected in the FSP.

evidence that certification had effected a change in forest practices at the cutblock and landscape level. She noted two examples of influence on practices for landscape level biodiversity. In one case, indicators and targets for biodiversity conservation were set beyond legal requirements by a public advisory committee that was supporting CSA certification for the tenure holder. In another case, an FSC requirement for the conservation of high value conservation forests resulted in a different selection of areas for old forest retention than those selected through the government-led land use planning process, although it did not necessarily increase the amount of forest area.

5.7 Perceptions of FRPA Goal Achievement

Prescribing foresters were asked to provide their perceptions of the degree of change that had occurred since the implementation of FRPA as related to broad goals specified for the legislation: maintaining environmental standards; reducing operational planning costs; reducing administrative complexity and timelines related to plan development and approval; increasing professional accountability and freedom to manage; and, maintaining public confidence. Most respondents believe that their accountability has significantly increased under FRPA but their professional freedom to innovate has only somewhat increased. They believe that operational planning costs and administrative complexity have actually somewhat *increased* instead of decreased under the FRPA framework (Table 18).

With respect to environmental standards, prescribing foresters perceive that there has been no change between operations under the FPC and under FRPA, which is understandable given the predominant commitments to implement the default practices in FRPA that are essentially a continuation of FPC practices. Despite the perceived maintenance of environmental values, they agree that public confidence in forest management has been somewhat reduced under FRPA.

TABLE 18: PERCEPTIONS OF FRPA GOAL ACHIEVEMENT

	Significantly Reduced (1)	Somewhat Reduced (2)	No Change (3)	Somewhat Increased (4)	Significantly Increased (5)	Rating Average
Operational Planning Costs	0.0% (0)	25.0% (7)	21.4% (6)	**32.1% (9)**	21.4% (6)	3.5
Administrative Complexity	6.9% (2)	24.1% (7)	17.2% (5)	**24.1% (7)**	27.6% (8)	3.41
Professional Accountability	0.0% (0)	0.0% (0)	20.7% (6)	24.1% (7)	**55.2% (16)**	4.34
Freedom to Innovate	0.0% (0)	3.4% (1)	17.2% (5)	**58.6% (17)**	20.7% (6)	3.97
Environmental Standards	3.4% (1)	6.9% (2)	**65.5% (19)**	20.7% (6)	3.4% (1)	3.14
Public Confidence	11.1% (3)	**48.1% (13)**	29.6% (8)	7.4% (2)	3.7% (1)	2.44
Timelines for Operational Planning	3.7% (1)	33.3% (9)	**18.5% (5)**	25.9% (7)	18.5% (5)	3.22
Timelines for Plan Approval	7.1% (2)	21.4% (6)	**25.0% (7)**	28.6% (8)	17.9% (5)	3.29

Many of these findings are echoed in comments received in a 2010 survey of forest professionals (BC MoFR, 2010). Some of the respondents to that survey indicated a perception that professional reliance has led to increased costs, timelines and workloads for proponents submitting plans, with minimal to no reduction in workload to MFR personnel. They also suggested that government approvers are very risk adverse and not willing to approve innovative practices proposals in FSP's. However, when asked whether professional reliance *will* lead to reduced transaction costs and more efficient processes, industry respondents generally agreed, suggesting that they may believe that these benefits may yet be realized. Government respondents, however, were neutral on this response.

With respect to stewardship, industry respondents to the 2010 survey reflected the same perception as the respondents to this research in 2007 – that the environmental standards remain largely the same under FRPA as they were under the FPC. These respondents were neutral in their perception of whether advancing professional reliance will actually increase stewardship. Government professionals however, disagreed with that statement, and some also provided comments indicating their perception that environmental standards have in fact decreased (BC MoFR, 2010).

The one area where there is a high degree of convergence in perception among respondents is that maintaining public confidence in forest management is clearly an issue with the implementation of the FRPA regime. A survey carried out by the Association of BC Forest Professionals in 2009 concluded that only 37% of British Columbians are satisfied with forest management in BC – the lowest level of satisfaction received in their polling since 2002 (ABCFP, 2009). Forest professionals who responded to the 2007 survey believe that public confidence has decreased and all forest professionals (industry, government and consulting) that responded to the 2010 professional reliance survey disagreed on average with the statement that "advancing professional reliance will lead to increased public understanding, confidence and trust in professionals" (BC MoFR, 2010). In its early days of implementation in 2006, the Forest Practices Board was pointed in their concern for the maintenance of public confidence under FRPA, given the reduced opportunities for public engagement in review of operational plans and the very 'legalistic' nature of Forest Stewardship Plans (BCFPB, 2006). It appears the issue remains a significant one today.

5.8 Summary

Prescribing foresters believe that innovation is key to long-term forest sustainability and that the FRPA framework has somewhat, (but not significantly), increased their flexibility to pursue innovative practices. However, they also agree that there is little evidence of the potential for innovation in forest practices reflected in early Forest Stewardship Plans. While some suggest that there will likely be increasing examples of innovation in the future, there is a fairly strong convergence in opinion about the reasons for the lack of innovation as of March 2007.

Most significant is the perception held by a majority of prescribing foresters that the default forest practices identified under FRPA are reasonably effective. These are the essentially the same forest practices that foresters became accustomed to implementing under the Forest Practices Code when they were a mandatory practice requirement. It is interesting to note that there is a fairly high degree of comfort and acceptance for those practices. However, the second most significant reason identified by prescribing foresters for the lack of innovation relates to a perception that the development of a rationale to support government approval for alternative and innovative practices is time consuming and costly and puts at risk the certainty of government approval for their FSP. They suggest this is largely due to an aversion to risk and a

lack of trust in professional reliance on the part of government approvers. Furthermore, with the climate of economic hardship in the forest sector at the time of this research, the potential benefit of pursuing innovative practices was not perceived as sufficient to outweigh the potential cost and risk to timely approval of their plans.

Underlying this however, is a fundamental issue that will continue to create a challenging context regardless of the approach to forest practices regulation that is implemented in B.C. Public interest and demand for the management of environmental values associated with forests – including biodiversity, wildlife habitat, riparian area values and soil productivity – is clear, as is government's acknowledgement of the need to manage for these values. However, significant knowledge gaps remain in our understanding of the relationship between forest practices and the conservation of these values: just how much old growth is required and in what pattern to maintain biodiversity?; just how much habitat is required and in what pattern to maintain viable populations of species?; just how much retention within riparian areas is necessary to maintain the variety of values associated with these areas? As a result, there are also widely differing views regarding the practices required to achieve government's goals for these values. The default practices defined under FRPA (and developed under the FPC) are based on some science, but they are ultimately a product of social choice and a reflection of risk tolerance. They are a set of practices that collectively attempt to balance government's goals for forestry and economic development with goals for the management of environmental values.

This context creates a significant challenge for the evaluation of alternative forest practices. In the absence of clear information with which to evaluate the potential implications of alternative approaches, statutory decision-makers could pursue one of the following three options:

a. Accept risk – accord full trust to industry professionals to properly assess and manage risk;
b. Avoid risk - encourage licensees to accept the default practices or to implement alternatives that are highly consistent with the default practices, and;
c. Manage risk – support the implementation of alternative approaches where the tenure holder has either provided sufficient information to effectively assess risk, or commits to undertaking implementation and effectiveness monitoring and reporting of results, and adaptively managing.

The province's conceptual framework for FSP evaluation reflects a 'risk management' approach. It assumes there is a corresponding increase in risk with the degree of departure of a proposed practice from the default practice for that value and places a proportionate level of onus on tenure holders to supply information to support their proposed alternative approach, and/or to commit to implementation and effectiveness monitoring (although there is no requirement for licensees to report the results of monitoring the implementation or effectiveness of alternative practices to either the government or to the public).

Prescribing foresters however, believe that the province's risk management framework places too much onus on tenure holders and that it is ultimately too costly in time and resources to pursue alternative practices. Their comments seem to indicate a perception that government should instead accept a higher level of risk and trust that professionals employed by industry will adequately manage the risk to environmental values on behalf of society

CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

When the Province of BC introduced the results-based Forest and Range Practices Act (FRPA) in 2004, it had high expectations for the outcomes that would be achieved. The government committed to upholding the same environmental standards that had been established under the former Forest Practices Code while incurring much lower cost to both industry and government. Furthermore, the increased reliance on professionals employed by tenure holders and freedom in their opportunity to manage was expected to help open the door to innovation in forest practices.

It is this latter goal that was the focus of this research - to evaluate the potential for the FRPA framework to foster the development of innovative forest practices and provide professional freedom to manage in the delivery of defined results. Three key environmental values provided the focus for this evaluation: 1) soils; 2) landscape and stand level biodiversity; and 3) riparian areas.

This research specifically set out to address the following four questions:

1. To what extent does the FRPA framework reflect a 'performance-based' regulatory approach and provide opportunities for innovation in forest practices?
2. To what extent are forest licensees taking advantage of the flexibility provided by the performance-based components of the FRPA framework, and developing alternative and innovative forest practices to manage for selected environmental values?
3. What are the factors that are influencing licensee response to the FRPA framework, and their willingness to innovate with respect to practices for maintaining environmental values?
4. Are the initial experiences in implementation of the Forest and Range Practices Act consistent with the propositions in theory that performance-based approaches to regulation should stimulate innovation and cost-effectiveness? Why or why not?

This chapter summarizes the main findings of this research, offers conclusions on the potential for the FRPA framework to foster innovation in forest practices, summarizes the strengths and limitations of this research, and identifies recommendations for further research in this area.

6.1 Summary of Findings

6.1.1 Evaluating the FRPA Approach to Performance-Based Management

Chapter Three of this thesis provided an overview of the FRPA regulatory framework and characterized its approach relative to the literature on performance-based management. It outlined how the FRPA framework is not purely performance-based, but in fact reflects a complex mixture of regulatory approaches.

The FRPA framework includes the essential elements of performance-based regulation: the regulator has specified goals for the regulation, objectives for forest management and in some cases performance standards; regulated entities have some flexibility in defining the practices that can be employed to achieve these outcomes, and the regulator has committed to monitoring and enforcing compliance. Qualified professionals employed by the forest tenure holders are accorded greater opportunity and accountability for the identification of forest practices. However, there are some key challenges with the FRPA framework and the forest management context more broadly that call in to question its potential effectiveness, including:

1. lack of clarity and measurability of desired outcomes for forest management;
2. gaps in our knowledge of the cause and effect relationship between forest practices and desired outcomes; and
3. challenges with compliance and effectiveness monitoring for alternative practices

Clarity and Measurability of Desired Outcomes

The FRPA framework identifies very broad objectives (all of which are constrained by an objective to prevent undue impacts to timber supply) that provide little in the way of measurable or verifiable desired outcomes. In some cases these are complemented or replaced by more specific land use objectives, but this is highly variable across the province. For a small number of values, there are quantitative performance standards that are so specific as to be arguably inconsistent with a performance-based approach. There are also some qualitative performance

standards that do, in fact, define desired outcomes that are verifiable, such as requirements to maintain fish passage or to not cause a landslide. For many environmental values and their associated components and practices, the most specific direction concerning desired outcomes is provided by default forest practices that indicate acceptable practices that are considered to be consistent with FRPA objectives
Licensees can choose to implement these default practices, or to propose alternative approaches for approval by government.

This 'default practice' approach, along with the qualitative standards provided for some values, theoretically provides opportunity for the implementation of alternative and innovative forest practices. However, prescribing foresters believe there is less opportunity in reality for the implementation of alternative approaches, due to perceived difficulties in receiving approval from government (discussed further in section 6.1.3). This issue is partly a result of the lack of measurable or verifiable desired outcomes specified within FRPA objectives, which in turn makes it difficult to evaluate the 'consistency' of alternative results or strategies with government's objectives. It is also partly a result of challenges inherent in the broader forest management context, discussed as the next area of concern.

Knowledge of cause and effect between forest practice and desired outcomes
In addition to having defined measurable or verifiable outcomes, a second criteria for *effective* performance-based regulation is that the cause and effect relationship between desired outcomes and the practices to achieve them is clearly understood. Yet rarely do we have sufficient science or knowledge to support such an understanding in the management of environmental values in forestry, and filling knowledge gaps usually entails a significant investment in research and/or monitoring. As a result, the forest practices identified under the FPC and continued as defaults under FRPA, are typically a product of negotiation to find a socially acceptable balance between best available science and perceived risks to environmental values, and timber harvesting objectives. This is a context that provides challenges for any regulatory approach but perhaps more acutely so for performance-based management.

The FRPA framework attempts to address this challenge by applying a risk-based evaluation framework for the approval of alternative practices. This framework requires licensees to supply

increasing levels of information in proportion to the degree of risk in proposed alternative practices. Risk is defined by the degree an alternative approach departs from the default forest practices. If licensees wish to pursue alternative forest practices that are significantly different from the default practices, they need to either demonstrate sufficient science or knowledge to support a rationale for how their practices are consistent with government's objectives, which given the context just described is difficult to do, or commit to monitoring and adaptive management – a potentially expensive venture. This leads to a third area of concern.

Challenges with compliance and effectiveness monitoring:

A third criterion for effective performance-based regulation is compliance and effectiveness monitoring. FRPA compliance and enforcement monitoring is undertaken by the Ministry of Forests and Range, although levels of inspection have decreased by roughly 40% under FRPA, relative to inspection levels under the FPC. Additionally, the Forest and Range Evaluation Program undertakes monitoring to assess the effectiveness of the FRPA regime in achieving government's goals for the 11 FRPA values. However, it is unclear to what extent forest licensees or the government are specifically evaluating the effectiveness of alternative forest practices, as distinct from the default practices. Ongoing monitoring is important to permit learning as to the relative effectiveness of both default and alternative practices. It is also unclear how compliance and effectiveness monitoring is occurring for alternative strategies that commit to achieving an outcome over an extended time frame – such as the commitment to retain a target amount of retention in riparian reserve zones at a watershed level, over a period of 5 years.

Finally, it must be acknowledged that the challenge of identifying forest management objectives or desired outcomes in a manner that is measurable or verifiable is not unique to the FRPA regime. There is a fine and often elusive line in trying to identify objectives with sufficient specificity as to be clear and enforceable while still providing flexibility to allow for innovation. This very issue has been acknowledged by a number of academics reviewing other performance-based regimes.

6.1.2 The Potential for Innovation Indicated in Forest Stewardship Plans

Chapter Four of this thesis summarized the results of a review of forest practice commitments for soils, biodiversity and riparian areas identified in the first 65 FSP's approved under FRPA. It noted that on average only 10% of forest practice commitments reflected alternative approaches, while the majority of practices committed to undertake the default practices, or proposed only a minor revision to the default. The greatest number of alternative practices was identified for stand level biodiversity practices (25% of practice commitments) and for riparian areas (10% of practice commitments) while few alternative practices were noted for soils (2%) and landscape level biodiversity (5%).

Prescribing foresters who developed the alternative forest practices on average identified these alternative approaches as 'moderately innovative' (a score of 3 on a scale of 1 to 5). However, they also indicated a general perception in their comments that overall there has been relatively little innovation to date (as of 2007) in forest practices identified pursuant to FRPA – consistent with the findings of the FSP review carried out for this research.

It is important however, to acknowledge a couple of key limitations with this research. The first is the difficultly in practically defining and identifying innovative forest practices. For the purpose of this research the following definition was used - *new practices that are intended to provide a more cost-effective means of maintaining or improving identified forest values*. This definition was tested with case study proponents who generally confirmed its acceptability, although one respondent suggested removing reference to 'cost' and just leaving it at 'effective'.

In practice however, it can be difficult to apply this definition and identify the degree of innovation in a proposed practice. In the author's opinion, many of the alternative forest practices that were identified are better characterized as alternatives that increase the flexibility in site level application of the default approach, rather than particularly new or innovative practices. Take for example an alternative practice identified for riparian reserve zones, in which the tenure holder commits to achieving the same level of overall forest retention in riparian reserve zones at a watershed level as the default practices over a 5 year period, but allows for variation from the specific reserve zone widths at a site level. The default and alternative practices will achieve essentially the same outcomes at a watershed level, but the default practice will apply consistent reserve zone widths while the alternative will allow variation at a site level. It is arguably an

innovative approach to achieving the same outcome (at a watershed level), potentially with increased cost-effectiveness, but is not really a 'new' practice. Similarly, most of the alternative practices identified for stand level biodiversity are different from the default practice, but are not actually new practices. Nonetheless, despite the difficulties in practically defining the degree of innovation in a practice, it has been insightful to understand the relative degree of innovation perceived by prescribing foresters for their alternative practices, and their belief in the importance of innovation for long-term sustainability.

Soliciting input and perceptions from prescribing foresters was also important in addressing a second, and potentially very key limitation of the methodology used in this research – namely an assumption that the practices specified in a FSP are a good indication of the practices that will ultimately be implemented on the ground. This assumption is actually somewhat questionable. FSP's are the single legally enforceable planning document under the FRPA regime, and licensees are legally accountable for delivering on all commitments specified in these documents. As a result, they have been largely written in legal language, and viewed by tenure holders as reflecting minimum practices that are legally required under FRPA. If tenure holders elect to implement practices that are incremental to FRPA requirements, for example to meet certification requirements or an agreement with a stakeholder or First Nation, they typically would not reflect this in their FSP, as it would then become enforceable by government.

One case study participant clearly acknowledged this issue and the limitation of assuming FSP's reflect practices on the ground. However, this licensee is also the only major licensee to have received FSC certification, which does in fact compel some incremental practice requirements 'on the ground' unlike the other certification regimes. Furthermore, none of the other case study participants nor any of the survey respondents identified a concern with using the practices identified in the FSP for the purpose of this research, leaving the author to believe it is reasonable to assume the practices identified in an FSP provide a good indication of the practices that will be implemented in the field, with a couple of notable exceptions. There are a couple of areas – such as retention within riparian management zones - where the FSP practice commitments are extremely vague, or don't provide any indication of practices that will be implemented in the field. Such practices can only be assessed through a review of on the ground results.

6.1.3 Factors Influencing Licensee Response and Willingness to Innovate

The hypothesis for this research was that implementation of the FRPA framework would result in a diversity of alternative and potentially innovative forest practices being identified in Forest Stewardship Plans. It was further hypothesized that the following factors would influence and ultimately constrain the number of alternative practices: 1) *perceptions that Code/ FRPA default practices are reasonably effective*; 2) *perceptions that the Code / FRPA default practices are economically efficient; 3) decreased access to financial resources 4) perception of increased cost associated with developing alternative practices; 5) perceptions of increased risk and liability associated with alternative forest practices.* Conversely, 6) *third-party certification commitments* were hypothesized as providing a potentially positive influence on the number of alternative forest practices.

Chapter Five explored the rationale provided by prescribing foresters for their choice of default or alternative practices and the influence of the above hypothesized factors. The first hypothesized factor was confirmed as the most influential – a majority of foresters believe that the FRPA default practices are reasonably effective. By the same token, foresters tended to identify alternative practices when they perceived the defaults to be less than effective. A desire to improve ecological effectiveness and cost-effectiveness were the two most important reasons foresters opted to develop alternative practices where they did.

'Certainty of FSP approval', 'simplicity', and 'timelines were identified as the second, third and fourth most important reasons respectively for the choice of default practices. The very significant influence of timing is likely not be as influential on the development of future FSP amendments or successor FSP's. This research was carried out early in the implementation of FRPA, at a time when most licensees were still on a learning curve with the new regime. It was also a time of economic downturn in the forest sector and several foresters acknowledged the influence of staff cutbacks leaving little time and resources to invest in FSP planning. Several noted an overriding objective to get their FSP approved in order to keep the wood flowing to the mill and suggested they would likely invest greater time in considering alternative practices in the future.

While only a few respondents specifically identified cost as one the most important reasons for the selection of default practices, many respondents spoke to the influence of cost in their comments – suggesting that the development of alternative practices is onerous, time consuming and costly. Prescribing foresters also agreed that larger companies are more likely develop alternative practices due to greater access to resources, although this assumption was not specifically tested in the FSP's reviewed for this research. The hypothesized factors of access to resources and perceptions of increased cost associated with the development of alternative practices were therefore confirmed in this research as influencing licensee willingness to innovate.

Perceptions of increased risk and liability were not confirmed as influencing licensee willingness to innovate. Foresters agreed that they have increased accountability under the FRPA regime but did not confirm that this as having a significant influence on their choice of forest practices.

6.2 Conclusions – Will FRPA Foster Innovation in Forest Practices?

A preliminary evaluation of early implementation of the FRPA framework suggests that this partially performance-based regime does not appear to have *significantly* influenced the development of alternative and potentially innovative practices. However, the FRPA framework does provide forest licensees with some increased flexibility to develop and implement alternative and potentially innovative practices, clearly more so than its predecessor, the FPC.

While only a minority of tenure holders opted to pursue alternative forest practices in the FSP's reviewed for this research, many prescribing foresters suggested that this is in large measure due to the timing of this research. In 2007, early in FRPA implementation, there was an overriding objective of tenure holders to pursuing the simplest, cheapest route to securing approval for their first FSP within the necessary timelines. Several prescribing foresters stated a priority to have the security of an approved FSP to continue their forest operations before they could turn their minds to the possibility of alternative practices and seek FSP amendments if necessary. This suggests that future FSP's and amendments should reflect increasing numbers of alternative and potentially innovative forest practices, the degree of which will likely continue to be influenced in part by the expectations of Statutory Decision-Makers with respect to acceptable documentation and risk evaluation to support alternative practices, and the degree to

which licensees are willing to invest in research and monitoring of the implementation and effectiveness of alternative approaches. In addition, if licensees find that the alternative practices identified in this first round of FSP's are innovative and successful in achieving their desired outcomes, and if these results are communicated to other tenure holders, then there will likely be evidence of diffusion of these innovative practices in future FSP's, as might be predicted by Roger's theory of diffusion (Rogers, 1994).

A commitment to structured approaches to testing, monitoring and reporting the effectiveness of alternative practices would likely increase public confidence and support for licensee innovation, as well as the certainty of government approval of alternative practices. However, it is also possible that the cost of research and monitoring could outweigh the perceived benefits of alternative approaches, influencing licensees to either accept default and known practices or to pressure government to simply trust that industry will adequately manage risk to defined values. The government is clearly committed to supporting professional reliance and enabling innovation in forest practices where possible and SDM's will be motivated to uphold this objective of government in their decision-making. However, the ultimate success of the FRPA regime is also very much reliant upon public support and confidence in the regime. If government simply accepted alternative practices without solid information to support their approval or a commitment to monitoring and adaptive management, they would further cement a public perceptions that exists with some members of the public today, that FRPA is effectively about 'deregulation' of forest practices. This is a tension that will remain and likely be variably addressed by different SDM's.

If there is little indication of innovation in forest practices over time under this regime, the overriding value in implementing a performance-based approach to forest practices regulation should be further evaluated. Indeed it seems one of the most important but challenging requirements for the design of effective forest practices regulation is how to provide sufficient flexibility at a site level to enable the implementation of practices that are ecologically and economically suitable to different site conditions, while still ensuring the achievement of environmental standards overall. Even if FRPA does not prove successful in fostering innovation *per se*, it still may be more effective than both of its predecessor approaches – voluntary guidelines and the prescriptive approach of the FPC – in addressing this need for flexibility.

But the ultimate success and effectiveness of the FRPA regime will depend upon the degree to which it attains all of its stated goals – not just those for innovation and professional freedom to manage. If FRPA is not successful in achieving its goals for reduced transactional costs to industry and government, there will undoubtedly be further pressure from both sources for continued regulatory reform. And if FRPA is not successful in maintaining environmental standards, as per government's commitment, there will undoubtedly be further pressure from environmental organizations and the public for a different approach to regulation. There has been a significant decline in recent years in public confidence in forest management (ABCFP, 2009), some of which may be attributed to reduced opportunities for meaningful public engagement in forest development planning as a result of the FRPA regime. In the author's opinion, public support for the implementation of alternative and potentially innovative forest practices will be highly influenced by the effort that is put into monitoring and public reporting of results by both forest licensees and the government.

6.3 Recommendations for Further Research

This research provided an initial evaluation of the potential for innovation in forest practices under FRPA, as indicated by Forest Stewardship Plans and the prescribing foresters who developed them. Given the timing of this research and funding limitations, it was not possible to assess on the ground results under FRPA – which is ultimately required to confirm the actual degree of innovation in forest practices. There are a number of areas where further research could build upon and significantly improve the goals of this research to evaluate the potential for FRPA to foster innovation, as outlined below.

6.3.1 Field-based Evaluation of the Innovation in Alternative Forest Practices

It would be highly useful and informative to carry out a review of practices implemented on the ground under FRPA, to fully evaluate alternative practices and the degree to which they may be innovative. Priorities for field review could include the following:

1. Review alternative practices identified in FSP's on the ground to further evaluate their 'innovativeness'. It would be interesting, for example, to evaluate alternate riparian reserve zone practices that allow for site level flexibility and assess whether they might

actually provide a more cost-effective and ecologically effective approach to achieving watershed level objectives for riparian management.

2. Review practices for which there is limited or no measurability of results provided within FSP's, such as riparian management zones. Actual outcomes of some practices were effectively impossible to evaluate in this research because the practices identified were either non-committal (e.g. the amount of retention will be determined in the field) or vague (e.g. 0-50% retention targets).
3. Review alternative practices to evaluate whether or not they are effectively enabling or trending to an overall reduction in conservation for environmental values. Alternative practices for stand level biodiversity practices would be good to evaluate in this regard, as several FSP commitments seem to enable reduced levels of retention overall but this may or may not be the case on the ground.
4. Evaluate the degree to which practices implemented in the field are different or incremental to those identified in FSP's. While FSP's clearly indicate practices that will be implemented by licensees at a minimum (and if they are not this should be identified by compliance and enforcement audits and/or Forest Practice Board audits) there may be incremental levels of 'conservation' associated with certification requirements, negotiated agreements with First Nations or stakeholders, or operational constraints.

6.3.2 The Diffusion of Innovation

This research focused on evaluating whether FRPA framework will be successful in enabling or incenting tenure holders to test alternative and potentially innovative practices – a fundamental starting point for the innovation process. If alternative practices identified in initial FSP's approved in 2007 are implemented on the ground and confirmed to be innovative and successful in achieving desired outcomes, then it is likely that there will be increasing levels of diffusion of these practices over time across all forest tenure holders. It would be interesting to consider the key factors theorized by Rogers (1994) as influencing the rate of diffusion of an innovation, and how these actually affect the rate of diffusion of innovative forest practices under FRPA over time.

6.3.3 FRPA Goal Achievement

While this research focused on the potential for the FRPA to achieve one of its stated goals, to foster innovation in forest practices, the success and effectiveness of this regime will depend upon the degree to which it attains all of its stated goals. Further research should be undertaken to evaluate the effectiveness of the FRPA regime in achieving its other stated goals: the maintenance of environmental standards, relative to the FPC; a reduction in transactional costs to government and industry, again relative to the FPC, and; the maintenance of public confidence in forest management.

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APPENDIX 1: WEB-BASED SURVEY

Effecting Innovation? A Preliminary Evaluation of the Results-Based Forest and Range Practices Act

Dear Participant,

Thank you for participating in this study.

We would like to assure you that your identity will remain completely confidential and the answers you provide will remain anonymous.

It is our hope that the results of this research project will be of interest and use to foresters, resource managers and researchers alike who have an interest in understanding the potential effectiveness of the new results-based Forest and Range Practices Act (FRPA) framework in fostering innovative forest practices and professional freedom to manage.

Your participation in this survey is vital to realization of this goal.

Part A: Forest Stewardship Plan Commitments

This section of the survey asks for information regarding the commitments that you have made in your approved Forest Stewardship Plan (FSP), and the reasons for making those choices.

A1: Response to 'Default' Practice Requirements

Question 1: Column 1 in the table below lists the sections of the Forest Planning and Practices Regulation that contain *default* practice requirements, for which forest licensees must either undertake to comply with, or propose alternative results or strategies.

For each of the practices listed below, please identify whether you have chosen in your FSP to: (a) undertake to comply with the default FPPR practice requirement; (b) identify a practice that is required or specified by a land use objective or plan, or; (c) develop an alternative result and/or strategy. If you have developed any alternative results and/or strategies, please identify the degree to which you believe your alternative practice is *innovative*[33] by selecting the appropriate category from (1) not innovative to (5) very innovative.

FRPA Default Practice Requirements ***Forest Planning and Practices Regulation (FPPR)***	**a. Undertake to Comply with Default FPPR Practice Requirement**	**b. Result/ Strategy Defined by Land Use Objective**	**c. Alternative Result / Strategy Specified**	**Degree of Innovation in Alternative Strategy / Practice**				
				1 Not Innovative	**2 Somewhat Innovative**	**3 Moderately Innovative**	**4 Innovative**	**5 Very Innovative**
S. 35 Soil Disturbance Limits	☐	☐	☐					
S. 36 Permanent Access Structure Limits	☐	☐	☐					
S. 47 Stream Riparian Class	☐	☐	☐					
S. 48 Wetland Riparian Class	☐	☐	☐					
S. 49 Lake Riparian Class	☐	☐	☐					
S. 50 Riparian Mgt Area Restrictions	☐	☐	☐					
S. 51 Riparian Reserve Zone Restrictions	☐	☐	☐					
S. 52(2) Riparian Mgt Zone Restrictions	☐	☐	☐					
S. 53 Temperature Sensitive Streams	☐	☐	☐					
S. 64 Maximum Cutblock Size	☐	☐	☐					
S. 65 Green-up / Adjacency	☐	☐	☐					
S. 66 Wildlife Tree Retention	☐	☐	☐					
S. 67 Harvesting Restrictions in WTP's	☐	☐	☐					

[33] For the purpose of this project, an *'innovative forest practice'* is defined as a new practice that is intended to provide a more cost-effective means of maintaining or improving identified forest values.

Question 2: If you would like to elaborate on any of the responses provided in Question 1, please do so here.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Question 3: If you chose to adopt FPPR default practice requirements for any of the practices identified in Question 1 above, which (if any) of the following reflect your reason(s) for this choice. From the categories listed below, please rank the top three reasons *(1 = most important, 2 = second most important, 3 = third most important)*

___ a. Effectiveness – the default practices are reasonably effective
___ b. Cost - it's cheaper to adopt the default practices than develop alternatives.
___ c. Simplicity – it's simpler to adopt the default practices
___ d. Risk/liability – it's less risky to adopt the default practices
___ e. There are no other viable alternatives to the default practices
___ f. Timelines – requires less time for FSP development / approval
___ g. Certainty of FSP approval by the Statutory Decision-Maker
___ h. Other (please specify) _____

Question 4: If you chose to develop alternative results and / or strategies for any of the practices in Question 1, which (if any) of the following reflects your reason(s) for this choice. From the categories listed below, please rank the top three reasons *(1 = most important, 2 = second most important, 3 = third most important)*

___ a. To implement more cost-effective practices
___ b. To apply more ecologically appropriate or effective practices
___ c To meet third party certification requirements
___ d. To pilot innovative practices
___ e. Other (please specify) _____

A2. Response to Practices Without Default Practice Requirements

Question 5: The management of riparian management zones is one example where FRPA requires forest licensees to develop results or strategies, without providing standards or default practice requirements (with the exception of minor tenure holders for whom practice requirements are specified). To what degree are your proposed riparian management zone practices as specified in your FSP different from the practices you have typically applied under the Forest Practices Code?

1. Not Different	2. Slightly Difference	3. Somewhat Different	4. Different	5. Very Different
☐	☐	☐	☐	☐

Question 6: How innovative do you believe your proposed riparian management zone practices to be?

1. Not Innovative	2. Slightly Innovative	3. Somewhat Innovative	4. Innovative	5. Very Innovative
☐	☐	☐	☐	☐

A3. Response to Certification Provisions

Question 7: Did you choose to certify (or have another professional certify) any sections of your FSP in accordance with Section 16 (1.01)(a) of the Forest and Range Practices Act? Please identify all of the sections below that you chose to certify.

	The map referred to in section 5 (1) (a) (ii) of the *Forest and Range Practice Act* shows the boundaries of all applicable forest development units.
	The intended results or strategies, specified in the plan, in relation to the objective set by government for visual quality under section 9.2 of the Forest Planning and Practices Regulation are consistent with that objective.
	The plan accurately specifies the forest development units, the areas, and the cutblocks in accordance with section 14 (1) of the Forest Planning and Practices Regulation.
	In accordance with section 14 (2) of the Forest Planning and Practices Regulation, the plan accurately identifies for those forest development units, the things set out in section 14 (3) of the Forest Planning and Practices Regulation.
	In accordance with section 14 (4) of the Forest Planning and Practices Regulation, the plan accurately describes each area that is identified in it as a declared area.
	The measures specified in accordance with section 17 of the Forest Planning and Practices Regulation for the plan, to prevent the introduction or spread of species of plants prescribed in the Invasive Plants Regulation, will be effective.
	The measures specified in accordance with section 18 of the Forest Planning and Practices Regulation for the plan, to mitigate the effect of removing or rendering ineffective natural range barriers, will be effective.
	The free growing height referred to in section 44 (1) (b) of the Forest Planning and Practices Regulation is appropriate, and is of sufficient height to demonstrate that the tree is adapted to the

Question 8: Please state your reasons for your choice of whether or not to certify practices in accordance with Section 16 (1.10)(a).

_____
_____
_____
_____

Part B. Factors Influencing Forest Stewardship Plan Decisions

This section of the survey asks questions aimed at building an understanding of the factors that have influenced your choice of forest practices, and your willingness to test alternative and innovative approaches under the FRPA framework.

B1. Perceptions of the Forest Practices Code and Current Forest Management

Question 9: Generally speaking, how ***effective*** do you think the forest practices required by the Forest Practices Code (FPC) have been in maintaining the following values? The term *effective* is defined as *success in achieving desired objectives*. Please mark an **X** in the box that best reflects your perceptions of the effectiveness of the FPC in maintaining each forest value.

Forest Values	Effectiveness of the Forest Practices Code in Maintaining Selected Values Not Effective	Slightly Effective	Some-what Effective	Effective	Very Effective	Don't Know/ No Opinion
Environmental Values						
Soil productivity	☐	☐	☐	☐	☐	☐
Riparian habitat	☐	☐	☐	☐	☐	☐
Water quality	☐	☐	☐	☐	☐	☐
Wildlife habitat – generally	☐	☐	☐	☐	☐	☐
Wildlife habitat – species at risk	☐	☐	☐	☐	☐	☐
Landscape level biodiversity	☐	☐	☐	☐	☐	☐
Stand level biodiversity	☐	☐	☐	☐	☐	☐
Social / Cultural Values						
Outdoor recreation	☐	☐	☐	☐	☐	☐
Visual quality	☐	☐	☐	☐	☐	☐
Archaeological/cultural sites	☐	☐	☐	☐	☐	☐
Economic Values						
Forest sector competitiveness	☐	☐	☐	☐	☐	☐
Sustainable timber supply	☐	☐	☐	☐	☐	☐
Community economic stability	☐	☐	☐	☐	☐	☐

Question 10: One of the goals of the Forest Practices Code was to provide for a balance in the management of economic, environmental and social values in our forests. How well do you think that balance was achieved in terms of the emphasis provided for the management of each type of value? Place an **X** in the most appropriate category for each value.

	Too Little Emphasis		Appropriate Emphasis		Too Much Emphasis
Economic Values	☐	☐	☐	☐	☐
Environmental Values	☐	☐	☐	☐	☐
Social and Cultural Values	☐	☐	☐	☐	☐

Question 11: It is a stated intention of the Forest and Range Practices Act to maintain a similar balance of values in BC forests, through a different approach to regulation. Please identify how well you think balance will be achieved in terms of the emphasis provided for the management of each type of value under FRPA. Mark 'No Change' if you think the balance achieved by FRPA is exactly the same as the Forest Practices Code.

FRPA Goals	Too Little Emphasis		Appropriate Emphasis		Too Much Emphasis	No Change from Code
Economic Values	☐	☐	☐	☐	☐	☐
Environmental Values	☐	☐	☐	☐	☐	☐
Social and Cultural Values	☐	☐	☐	☐	☐	☐

Question 12: How important are each of the following goals of the Forest and Range Practices Act to you? Mark an **X** in the most appropriate category for each goal.

FRPA Goals	Not Important	Slightly Important	Somewhat Important	Important	Very Important
Reduce Planning Costs	☐	☐	☐	☐	☐
Reduce Administrative Complexity	☐	☐	☐	☐	☐
Increase Professional Accountability	☐	☐	☐	☐	☐
Increase Professional Freedom to Innovate	☐	☐	☐	☐	☐
Maintain Environmental Standards	☐	☐	☐	☐	☐
Maintain or Improve Public Confidence	☐	☐	☐	☐	☐

Question 13: Generally speaking, to what extent do you think the Forest and Range Practices Act has reduced or increased the following variables, relative to operations under the Forest Practices Code. Mark an **X** in the category that is most appropriate for each variable.

Variables	Significantly Reduced	Somewhat Reduced	No Change	Somewhat Increased	Significantly Increased	Don't Know / No Opinion
Planning Costs	☐	☐	☐	☐	☐	☐
Administrative Complexity	☐	☐	☐	☐	☐	☐
Professional Accountability	☐	☐	☐	☐	☐	☐
Professional Freedom to Innovate	☐	☐	☐	☐	☐	☐
Environmental Standards	☐	☐	☐	☐	☐	☐
Public Confidence	☐	☐	☐	☐	☐	☐
Timelines for Operational Planning	☐	☐	☐	☐	☐	☐
Timelines for Plan Approval	☐	☐	☐	☐	☐	☐

Question 14: Listed below are statements expressing different views about forest land management and the environment in BC generally. For each statement, please indicate whether you Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree or Strongly Disagree. If you feel that you don't know enough about a particular statement, or don't have an opinion about a statement, select the Don't Know/No Opinion box.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Don't Know / No Opinion
There are enough checks and balances in place (eg. legislation professional ethics, forest certification) to ensure responsible forest management	☐	☐	☐	☐	☐	☐
The forest industry controls too much of the British Columbia land base	☐	☐	☐	☐	☐	☐
British Columbia has enough protected areas such as provincial and national parks	☐	☐	☐	☐	☐	☐
The citizens of BC need to have more opportunities for input into forest management	☐	☐	☐	☐	☐	☐
If forests are well managed to protect aesthetic values, the ecosystem is being managed well also.	☐	☐	☐	☐	☐	☐
Providing long term security of forest lands to forest companies will promote sustainable forest management	☐	☐	☐	☐	☐	☐
Forest management currently focuses too much attention on timber resources and not enough attention on non-timber resources (eg. recreation, visual quality)	☐	☐	☐	☐	☐	☐
There will be sufficient wood in BC to meet our future needs.	☐	☐	☐	☐	☐	☐
Forest companies have earned the trust to manage forests for the long-term	☐	☐	☐	☐	☐	☐

B2. Innovation

Question 15: Please indicate the degree to which you agree with the following statements. For each statement, please indicate whether you Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree or Strongly Disagree. If you feel that you don't know enough about a particular statement, or don't have an opinion about a statement, select the Don't Know/No Opinion box.

	Strongly Agree	**Agree**	**Neither Agree Nor Disagree**	**Disagree**	**Strongly Disagree**	**Don't Know / No Opinion**
There is a lot of opportunity for the development of innovative forest practices under FRPA	☐	☐	☐	☐	☐	☐
Increased professional reliance and independence under FRPA will inspire innovative forest practices	☐	☐	☐	☐	☐	☐
The freedom to test innovative forest practices is key to long-term forest sustainability	☐	☐	☐	☐	☐	☐
There is too much allowance for innovation under FRPA	☐	☐	☐	☐	☐	☐
Large forest companies with access to resources are more likely to test innovative forest practices	☐	☐	☐	☐	☐	☐
There is too much professional risk involved in testing new and innovative forest practices in my area	☐	☐	☐	☐	☐	☐
There is too much risk of legal liability for the company in testing new and innovative forest practices	☐	☐	☐	☐	☐	☐

Question 16: For each value listed in the first column, please indicate the degree to which you believe: (a) the possibility exists for developing alternative and innovative approaches to managing the selected value, and; (b) the opportunity is provided under the FRPA regime to test innovative practices.

Forest Value	**(a) Possibility Exists for Developing alternative and innovative approaches to management 1 = No Possibility – 5 = Ample Possiblity**	**(b) Opportunity Provided under FRPA regime to test Innovative Forest Practices 1 = No Opportunity – 5 = Ample Opportunity**
Soil Productivity / Soil Disturbance		
Riparian Areas		
Wildlife Habitat		
Landscape Level Biodiversity		
Stand Level Biodiversity		
Stocking / Reforestation		
Visual Quality		
Cultural Heritage Resources		

B3. Professional Independence and Liability

Question 17: To what extent do you believe: (a) your professional liability has changed under FRPA, and;(b) company / tenure holder liability has changed under FRPA (Mark an **X** in the most applicable categories)

	1 Significant Decrease	**2. Moderate Decrease**	**3. Slight Decrease**	**4. No Change**	**3 Slight Increase**	**4 Moderate Increase**	**5 Significant Increase**
Professional Liability	☐	☐	☐	☐	☐	☐	☐
Company Liability	☐	☐	☐	☐	☐	☐	☐

Question 18: Do your professional liability responsibilities under FRPA make you more or less willing to test new and alternative forest practices? (Mark an **X** in the most applicable category)

1 Significantly Less	**2 Less**	**3 Neutral**	**4 More**	**5 Significantly More**
☐	☐	☐	☐	☐

Question 19 As the prescribing forester for your Forest Stewardship Plan, how would you characterize your role relative to the role of the tenure holder / company management (if these are different people) in developing the FSP. Place an X next to the most applicable statement below.

☐ I have complete discretion and authority to develop the FSP and determine forest management direction

I receive strategic guidance from the tenure holder and then develop the FSP independently

☐ Forest management decisions are jointly made by myself and the tenure holder

☐ Forest management decisions are frequently made by the tenure holder. My role is to review and provide advice.

☐ Other (please specify)
_____

☐

Question 20: Did you receive legal advice on your draft Forest Stewardship Plan? (Mark an **X** in the most applicable category)

☐ Yes ☐ No

If you answered yes to this question, proceed to Question 21. If you answered no, proceed to Question 22.

Question 21: How would you characterize the influence of legal advice and company liability considerations in the development of your Forest Stewardship Plan?

1 Of little Influence	**2 Somewhat Influential**	**3 Moderately Influential**	**4 Influential**	**5 Very Influential**
☐	☐	☐	☐	☐

Question 22: How would you characterize the involvement of various resource professionals in the development of your Forest Stewardship Plan. Please mark an X in the most appropriate category for each resource professional.

Level of Involvement	Resource Professional Biologists	Engineers /Geosci-entists	Agrol-ogists	Forest Technol-ogist	Lawyers
No Involvement	☐	☐	☐	☐	☐
Provided professional advice on selected aspects of the plan	☐	☐	☐	☐	☐
Engaged in joint planning and decision-making for selected aspects of the plan.	☐	☐	☐	☐	☐
Engaged in joint planning and decision-making for most or all of the plan.	☐	☐	☐	☐	☐
Other (please specify) _____	☐	☐	☐	☐	☐

Question 25: Please indicate the degree to which you agree with the following statements. For each statement, please indicate whether you Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree or Strongly Disagree. If you feel that you don't know enough about a particular statement, or don't have an opinion about a statement, select the Don't Know/No Opinion box.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Don't Know / No Opinion
The role and influence of professional foresters has increased under FRPA	☐	☐	☐	☐	☐	☐
The role and influence of professional biologists has increased under FRPA	☐	☐	☐	☐	☐	☐
The role and influence of professional engineers and geoscientists has increased under FRPA	☐	☐	☐	☐	☐	☐
The role and influence of agrologists has increased under FRPA	☐	☐	☐	☐	☐	☐
The role and influence of lawyers has increased under FRPA	☐	☐	☐	☐	☐	☐
Professional foresters make decisions regarding forest practices independent of their client or employer	☐	☐	☐	☐	☐	☐
The interests of clients or employers strongly influence the forest management decisions made by professional foresters	☐	☐	☐	☐	☐	☐
Increased professional reliance and independence under FRPA will improve the quality of forest management	☐	☐	☐	☐	☐	☐
Professional foresters have too much discretion and authority under FRPA	☐	☐	☐	☐	☐	☐
Professional foresters should be entrusted to represent the public interest in forest management decisions	☐	☐	☐	☐	☐	☐

B4. Company Size / Resources

Question 26: Which of the following do you work for: (Mark an **X** next to one of the following)

- ☐ Forest company
- ☐ Consultant
- ☐ Community
- ☐ Government
- ☐ Other (specify) _____

Question 27: Would you say you are: (Mark an **X** next to one of the following)

- ☐ a company owner
- ☐ a manager or senior executive
- ☐ an employee

Question 28: How many employees are there in your company / organization? _____

Question 29: What is the total Allowable Annual Cut (m3/yr) managed by the tenure holder associated with this FSP? Please estimate. _____ m3/yr

Question 30: What type of forest tenure does your company or organization hold: (Mark an **X** next to one or more of the following)

- ☐ Community Forest
- ☐ Tree Farm License
- ☐ Forest License
- ☐ BCTS Operating Area
- ☐ Other (specify) _____

B5. The Role of Certification

Question 31: Is your company certified by an independent organization? (Mark an **X** next to one of the following)

- ☐ Yes
- ☐ No

If you answered yes to this question, proceed to question 32 If you answered no, proceed to Question 33.

Question 32: Which organization(s) is your company certified by? (Mark an **X** next to each applicable category)

- ☐ International Standards Organization (ISO)
- ☐ Canadian Standards Organization (CSA)
- ☐ Sustainable Forestry Initiative (SFI)
- ☐ Forest Stewardship Council (FSC)
- ☐ Other (specify) _____

Question 33a: To what extent have certification requirements effected a change in forest practices for your company / tenure area, above and beyond the legal requirements of FRPA? (Mark an **X** in the most applicable category).

1 No Change	2 Slight Change	3 Moderate Change	4 Significant Change	5 Very Significant Change
☐	☐	☐	☐	☐

Question 33b: If you would like to elaborate on the types of forest practices that have changed as a result of certification, please do so below

_____
_____
_____
_____
_____
_____
_____

B6. Knowledge / Experience / Demographics

Question 34: What is your age: _____ (years)

Question 35: What is your gender _____Male _____Female

Question 36: What city/town do you live in: _____

Question 37: What Forest Region do you work in: (Mark an **X** next to one of the following)

- ☐ Coast Region
- ☐ Southern Interior Region
- ☐ Northern Interior Region

Question 38: If you are a Registered Professional in any of the professions listed below, please enter the year(s) you were registered with the respective association(s).

_____ Professional Forester

_____ Professional Biologist

_____ Professional Engineer

_____ Professional Geoscientist

_____ Professional Agrologist

Part C:

Question 39: Would you be willing to engage in a phone interview (maximum 45 minutes) to provide further information and insight for this research project?

☐ Yes
☐ No

Question 40: Would you like to offer any final comments or insights as to how effective you believe the Forest and Range Practices Act will be in fostering innovative forest practices and professional freedom to manage?

This is the end of the survey. Thank you very much for your participation!

APPENDIX 2: SUMMARY OF PHASE 1 SURVEY RESULTS

EFFECTING INNOVATION? A PRELIMINARY ASSESSMENT OF THE RESULTS-BASED REGULATORY REGIME OF THE FOREST AND RANGE PRACTICES ACT

PHASE 1: DRAFT SUMMARY OF SURVEY RESULTS

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MSC. CANDIDATE, UBC FACULTY OF FORESTRY

JULY 30, 2007

DRAFT FOR DISTRIBUTION

INTRODUCTION:

Over the past couple of years the regulatory framework for managing forest practices in British Columbia (BC) has transitioned from a prescriptive and process-based system inherent in the Forest Practices Code (FPC) to a more 'results-based' or 'performance-based' system under the new Forest and Range Practices Act (FRPA). The stated goals of adopting a results-based approach include the following (Vold, 2003):

- Reduce transactional and operational costs to industry
- Reduce the Code's administrative complexity
- Provide industry the 'freedom to manage' in delivery of defined results and open the door to innovation in forest practices
- Maintain the Code's environmental standards
- Continue to balance social, environmental and economic interests, and
- Maintain and enhance the level of public acceptance of forest and range management.

With a performance-based approach to regulation the desired environmental outcomes or standards are specified by the regulator, but the firm may choose how to achieve that level (Coglianese and Lazer, 2003). Performance-based approaches are often upheld for their promise of increasing flexibility and innovation, and as a result, more cost-effective regulation (Coglianese, Nash and Olmstead, 2003). While performance-based management systems are commonly applied in other environmental regulatory contexts (eg. pollution control); BC is one of the first jurisdictions to apply a performance-based approach to the regulation of forest practices. As such, there is significant interest in assessing the effectiveness of this system in achieving desired forest management outcomes.

The FRPA framework is not purely performance-based however; it includes a mixture of regulatory approaches. For some values there are still mandatory practice requirements while for other values forest licensees have the discretion to design and implement forest practices so long as they are consistent with the legal objectives specified for various values. For a number of key environmental values however, the FRPA framework provides forest licensees the option of either implementing default forest practices that are defined in regulation, or developing alternative forest practices if they can demonstrate that these alternatives are consistent with legal objectives defined in FRPA for each forest value.

The overall objective for this research project is to assess the potential effectiveness of the FRPA regulatory framework in fostering the development of innovative forest practices[34] and providing professional freedom to manage in the delivery of defined environmental standards. More specific objectives are:

1. To assess the extent to which forest licensees are taking advantage of the flexibility provided by the performance-based components of the FRPA framework, and are developing alternative and innovative forest practices to manage for selected environmental values.
2. To identify the factors that are influencing licensee response to the FRPA framework.

[34] For the purpose of this project, 'innovative forest practices' are defined as new practices that are intended to provide a more cost-effective means of maintaining or improving identified forest values.

3. To assess whether the initial experiences in implementation of the Forest and Range Practices Act are consistent with the propositions in theory that performance-based approaches to regulation should stimulate innovation and cost-effectiveness, and to explore reasons why or why not.

PROJECT METHODOLOGY

This project includes two phases of data collection and analysis designed to address the project objectives. In the first phase data was collected through two sources.

1. Direct review of all Forest Stewardship Plans (FSP's) that were approved as of March 15, 2007. 65 FSP's were reviewed to assess licensee response to the performance-based components of FRPA. For environmental values that have default forest practices in regulation (soil productivity, riparian area management, landscape and stand level biodiversity), the selection of default or alternative practices was noted, and the rationale for alternative practices reviewed. Commitments identified for riparian management zone (RMZ) retention were also reviewed, to assess licensee response to an area where default practices are not provided.

2. Web-based survey of Prescribing Foresters Accountable for Approved FSP's.

71 Registered Professional Foresters (RPF's) have signed accountability for the 65 approved FSP's that formed the population of interest for this project. All 71 RPF's were sent a letter inviting them to participate in a web-based survey to collect information pertaining to the FSP's they prepared. 32 responses were received, of which 30 were deemed usable. These 30 responses represent 28 FSP's – a response rate of 43% relative to the number of approved FSP's, and 42% relative to the number of RPF's who were asked to participate.

The web survey included two components. The first component asked respondents to confirm the decisions made in their FSP with respect to the choice of default or alternative forest practices, and the key reasons for their selection of either approach. The second component of the survey explored licensee perceptions of the FRPA framework, and of various factors that may be influencing their response to the framework and willingness to innovate. In particular, perceptions and beliefs related to the following factors were explored:

- Perceptions of the effectiveness and efficiency of the former Forest Practices Code and the FRPA default practices;
- Perceptions and beliefs related to environmental, economic and social values
- Perceptions of the cost and complexity of developing alternative forest practices
- Perceptions of risk and legal liability associated with FRPA and the development of innovative forest practices;
- Perceptions of professional accountability and freedom to manage provided under FRPA;
- Perceptions and beliefs related to innovation, and;
- Perceptions of the influence of third-party certification on forest practice commitments.

Phase two of this project will involve detailed case study analysis for a small sample of FSP's (2-3). The objective for this phase is to explore in greater detail issues of interest that arise in Phase 1 of this

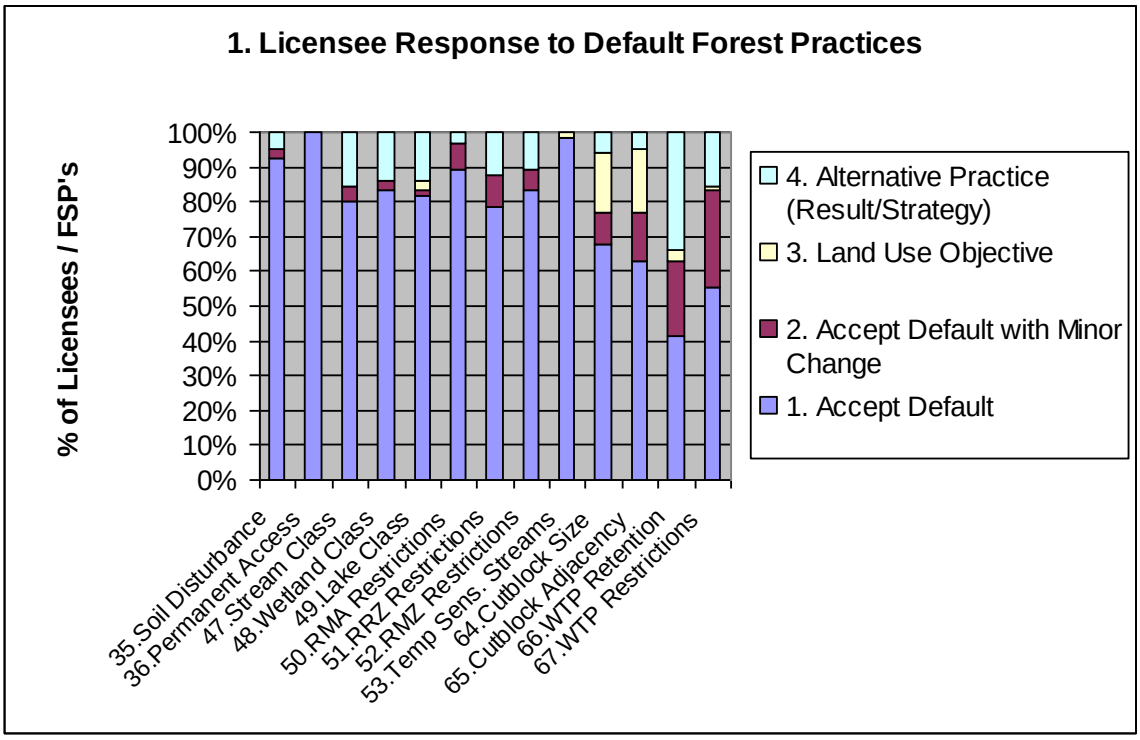
project. The precise methodology for Phase 2 will be confirmed upon completion of Phase 1 data analysis.

PHASE I DRAFT RESULTS

1. RESPONSE TO "DEFAULT PRACTICE REQUIREMENT" APPROACH

Question 1: *How did licensees respond to the 'Default Forest Practice' approach?*

Figure 1 below provides a summary of licensee response to the default forest practices, based on direct review of all 65 FSP's, and confirmed by survey data for 30 FSP's. On average, 78% of forest practice commitments (in 65 FSP's) reflected a choice of default forest practices, with an additional 8% of practices reflecting a minor modification of the default forest practice approach. An average of 3% of forest practices reflected requirements arising from legal (land use) objectives. Commitments to implement alternative forest practices (results and /or strategies) were reflected in 10% of forest practice commitments.



There is a great degree of variability in licensee response to default practices by forest value or practice requirement, as outlined below.

Soil Productivity (S. 35 and 36): 92% of FSP's (60) undertook to comply with default practices for soil disturbance (S.35), and additional 3% identified minor modifications to the default practices. The few exceptions to this (5%) were to propose alternatives that allow for increased soil disturbance to

regenerate deciduous species. 100% of licensees undertook to comply with the default practices for permanent access (S. 36).

Riparian Management: ***(S.47 – 53)*** 83% of FSP's (54) adopted default practice requirements on average across all the various components of riparian management, and an additional 5% accepted the default practices with minor changes or exceptions. 1% of licensees reflected riparian management practices arising from land use objectives. 10% of licensees identified alternative riparian management practices on average for all components of riparian management.

15% of FSP's (10 plans – 5 of which are associated with one company) identified alternative practices for the retention of riparian reserve zones. 9 plans committed to implementing either the default practices OR an alternative that will be specified in a site plan or written rationale. 7 of those plans committed to reserve the same net amount of area in reserve zones as would be achieved by the default practices, either at a watershed level (5 plans), cutblock level (1 plan) or Timber Sale Area (1 plan). One plan committed to the default practices plus additional retention consistent with the local Land and Resource Management Plan. The remaining 2 plans did not make any commitments regarding the intended size of reserve zones or amount of retention in reserve zones, except that they must not be less than 50% of the default width. The table below summarizes the riparian reserve zone practices identified in the 10 FSP's that committed to alternatives.

Table 1: Summary of Alternative Practices Identified for Riparian Reserve Zones

1. (5 FSP's)	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths as specified in a rationale that is consistent with the factors described in FPPR Schedule 1 s.2. Overall there will be no net change in riparian retention at a watershed level relative to default reserve zones (plus or minus 10%) over the term of the FSP or every five years. Allowance for spacing and thinning in a riparian reserve zone (removal does not affect watershed retention targets) where desired to improve riparian habitat structure and ability of trees to contribute to stream channel stability.
2	Will implement the default practices for riparian reserves zones for streams OR will identify alternative RRZ widths if a qualified professional determines that a different width is more practicable and identifies an alternative that reflects the Factors listed in FPPR Schedule 1 s. 2. The new RRZ must not be less than 50% of the default width.
3	Will implement the default practices for riparian reserves zones for streams OR an alternative reserve width described in a site plan that has an area of not less than the sum of the areas calculated by multiplying the minimum width for each default riparian class (streams, lakes and wetlands) in the cutblock by the length of the stream in the cutblock or length of the shoreline of the wetland or lake in the cutblock. Riparian reserve zones will be distributed in a practicable manner, having regard to the factors identified in FPPR Schedule 1 s.2, and will not exceed the width of the applicable riparian management area.
4	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths in a written rationale signed by a qualified professional, that will provide for the equivalent amount of reserve zone (and RMA and RMZ) within the gross area of the Timber Sale license. Any increase or decrease in riparian reserve

	would maintain or increase the effectiveness and/or functioning of the riparian reserve, (based on identified circumstances) and will be in consistent with the Factors in Schedule 1 s.2 of the FPPR.
5	Will implement the default practices for riparian reserve zones (streams, lakes and wetlands) OR will identify alternative reserve zone widths in a written rationale signed by a qualified professional. Any increase or decrease in riparian reserve would maintain or increase the effectiveness and/or functioning of the riparian reserve, (based on identified circumstances) and will be in consistent with the Factors in Schedule 1 s.2 of the FPPR.
6	Will comply with the default practices for riparian reserves, and in addition will demonstrate consistency with the Okanagan-Shuswap LRMP by electing to implement additional retention within reserve and management zones as outlined in the FSP. (Note: these LRMP objectives are not legal – policy only)

Landscape Level Biodiversity (Cutblock size and adjacency)(S. 64 and 65) – 69% of FSP's (45) undertook to comply with default practices for cutblock size, and an additional 9% (6) proposed only slight modifications to the default practices. 17% (11) committed to alternative cutblock sizes consistent with land use objectives for biodiversity that have been established within their tenure area. 5% of plans (3) identified alternative practices for cutblock size. One FSP identified an exemption from the default practices for cutblock size for stands that are at a high risk of infestation from mountain pine beetle. Two FSP's identified an allowance for cutblocks larger than the default size where there is a risk of the stands not being available at a future date due to the senescence of the alder or time restrictions on the license (these are tenure focused on the harvesting of hardwoods). (NOTE: the default practices for cutblock size allow for development of alternative sizes based on a patch size distribution analysis – therefore unlikely most response should fall in the category of 'default' or 'LU objectives'

63% of FSP's (41) undertook to comply with default practices for green-up and adjacency, and an additional 14% proposed minor revisions to the default forest practices. 18% of FSP's (12) committed to practices identified in land use objectives for their tenure area. 5% of FSP's (3) identified alternative practices for green-up and adjacency.

Stand Level Biodiversity (Wildlife Trees)(S. 66 and 67) – The greatest number of alternative practices were reflected in stand level biodiversity practices. 42% of FSP's committed to undertake default wildlife tree retention practices, 22% identified only minor changes to the default practices and 3% of FSP's identified practices arising from land use objectives. 34% identified alternative results or strategies for wildlife tree retention. With respect to restrictions in wildlife tree patches, 55% committed to the default practices, 28% identified minor changes to the default practices, 2% reflected land use objectives and 15% proposed alternative results or strategies.

Alternatives for wildlife tree retention can be categorised as amendments to the default practice requirements or alternative approaches to defining wildlife tree retention targets, as outlined in Table 2 below.

Table 2: Examples of Different Approaches to Wildlife Tree Retention

Approach	Description / Examples
1. Amendments to the default practice requirement	▪ Revising the cutblock level retention target (3.5% of cutblock area) to apply only to cutblocks greater than 10 or 15 hectares ▪ Revising the annual wildlife tree retention target (7% of all cutblocks harvested in a calendar year) to require achievement of this target for each cutting permit, over a 5 year term, over the life of the plan, or over all cutblocks harvested within a forest license. ▪ Specifying that wildlife tree retention targets do not apply where selection or patch cut silviculture systems are applied. ▪ Allowing for retention targets to be reduced where suitable wildlife tree attributes do not exist (ie. pure lodgepole pine stands) or where there is a forest health risk.
2. Alternative approaches to setting targets for wildlife tree retention.	▪ Many licensees committed to alternative targets for wildlife tree retention that were identified for each Biogeoclimatic subzone within each landscape unit (targets ranged from 0 to 13%). These targets have often been developed based on the procedures outlined in the (1995) Biodiversity Guidebook, and in some cases included in District Policies or in subregional land use plans. ▪ Several licensees included a requirement that the maximum distance between wildlife tree patches (WTP's) and the edge of the cutblock is no more than 500 metres, in addition to the target amounts of retention. ▪ Once licensee specified only the requirement for a maximum distance between WTP's and cutblock edge of 500 metres. ▪ One licensee (reflected in 4 FSP's) committed to retain >or = 7% of cutblock area in WTP's for areas that are > or = 250 metres away from already constrained areas. Cutblock areas that are within 250 metres of an already constrained area require > or = 0% retention.

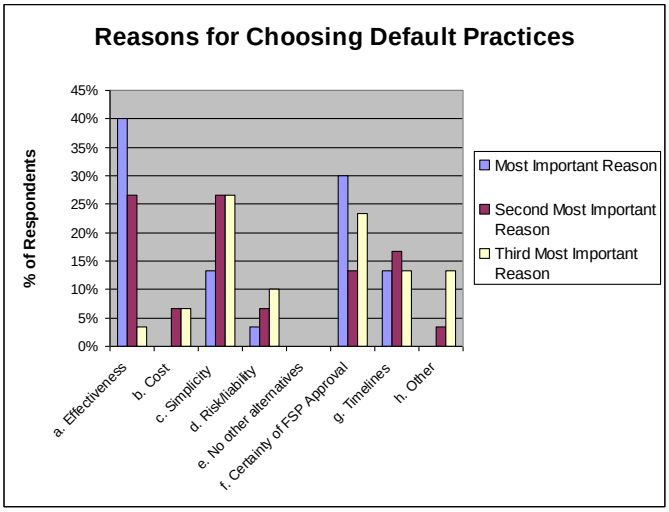
Question 2: *Why did respondents choose to adopt default forest practices?*

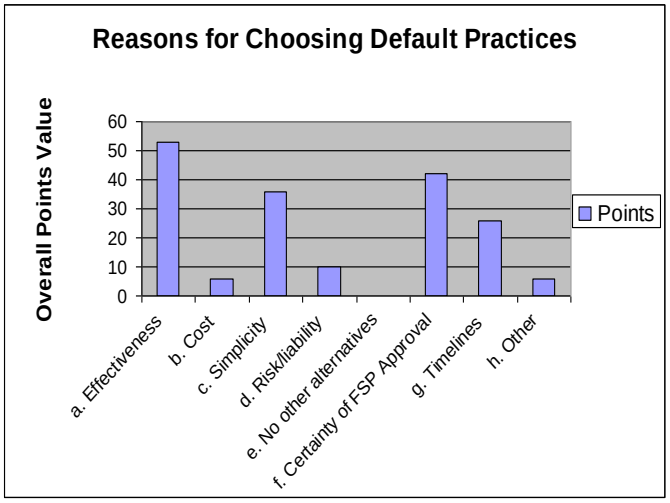
As outlined in Figures 4 and 5 below, the most important reason respondents identified for having selected default practices was ***effectiveness*** – reflecting a belief that the default forest practices are reasonably effective. The following comments from respondents also reflect this rationale.

> *"We felt that the available practice requirements would meet ecological needs and minimize impacts on our current business practices and processes. Creating a new alternate approach was not viewed as necessary to address local environmental conditions.*

> *"For the most part, the foresters I wrote the plan for were comfortable with the obligations and opportunities provided in FRPA/FPPR. Where they wanted to be more innovative and practice outside what was allowed for in the regulations, I modified the practice requirements."*

This response is further supported by the responses to Questions 13 and 14 outlined later in this summary, in which a majority of respondents indicated their belief that the practices required under the Forest Practices Code (which are largely the same as the default FRPA practices) have been generally effective in maintaining most environmental and social values.





The second most common reason identified was that of ***certainty of FSP approval*** if default practices were chosen. Several respondents alluded to a perceived difficulty in attaining approval for their FSP's if alternative practices were proposed, as noted in the following comments.

> *"In some cases, licensees have attempted to use innovation to lessen the degree of economic impact. These licensees have often had difficulty having their plans approved, as the burden of proof becomes quite onerous as soon as a licensee steps outside of the goalposts set by FRPA or existing policy (e.g. Higher Level Plans)."*

> *"…and some [alternatives] are just not going to be approved by the DM. Interestingly, some DM's have approved our alternatives while other DM's are currently implying they will not approve them"*

> *"Pressure from statutory decision maker to do this/include that 'or else' [noted as 'other' reason for the selection of default practices].*

> *"…the ability to employ or test new practices is limited by DDM's approvals of alternative results and strategies. To date in the local area, licensees have avoided alternates as it is deemed to be a major roadblock to FSP approvals. "*

One respondent noted that "*although 'default' or government established objectives were used for FSP approval, it is anticipated that 'one-off' amendments/variances will be required periodically*".

Simplicity and ***timelines*** were selected as the next most important reasons for the choice of default forest practices. The development of alternative forest practices was identified by a few respondents as complex, onerous and time consuming.

> *"I believe that in a time where innovative forest practices should be employed, a certain time constraint was first and foremost in tenure holders minds. Ensuring companies had an approvable FSP in order to continue operations was more important than developing innovative practices. The time that it takes to back up innovative results and strategies in order to ensure they are measurable and approvable is considerable and thus, often this is a deterrent. I would hope that once the province has all of these operational plans in*

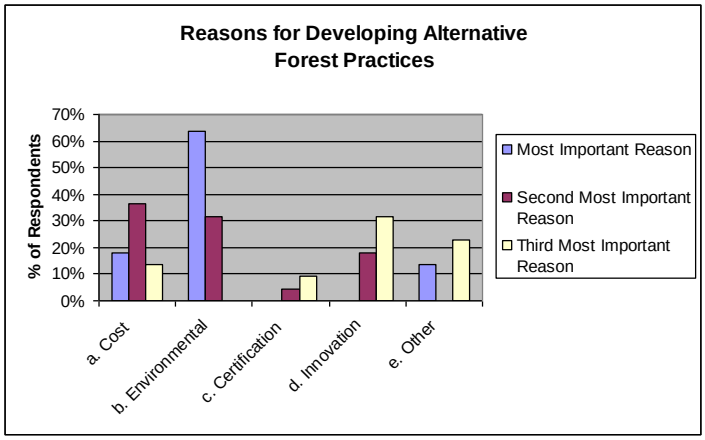
place, Licensee's will consider and develop more innovative R/S to further the knowledge and understanding of the forests, ecosystems and resources around us."

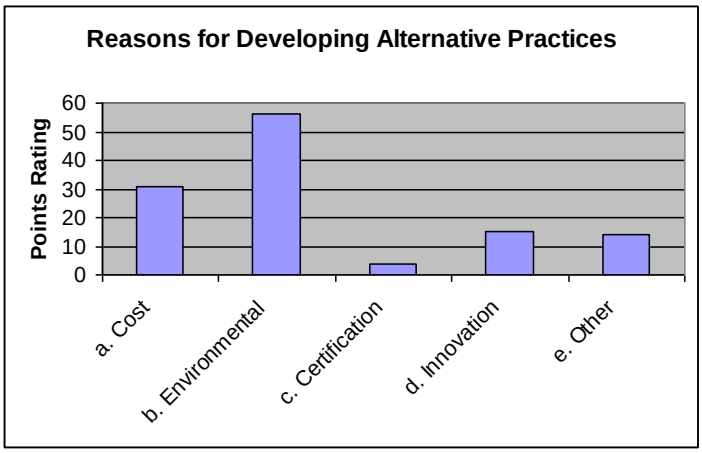
"There is a lack of ability of MOFR staff to accurately evaluate risk to resources associated with prescribing anything outside of a default. To actually prescribe anything outside of a default, becomes onerous and time consuming, as there is no skill, knowledge or process to evaluate whether it is approvable".

Only a few respondents selected **cost** (it's cheaper to adopt the default practices than develop alternatives) and risk / liability (it's less risky to adopt the default practices) as reasons for selecting default forest practices.

Question 3: *Why did respondents choose to develop alternative forest practices?*

As outlined in Figures 6 and 7 below, the most common reason selected by respondents for choosing to develop alternative forest practices was '***to apply more ecologically appropriate or effective practices'***. The second most common reason selected was ***'to implement more cost-effective practices'*** and the third most common was '***to pilot innovative practices'***.



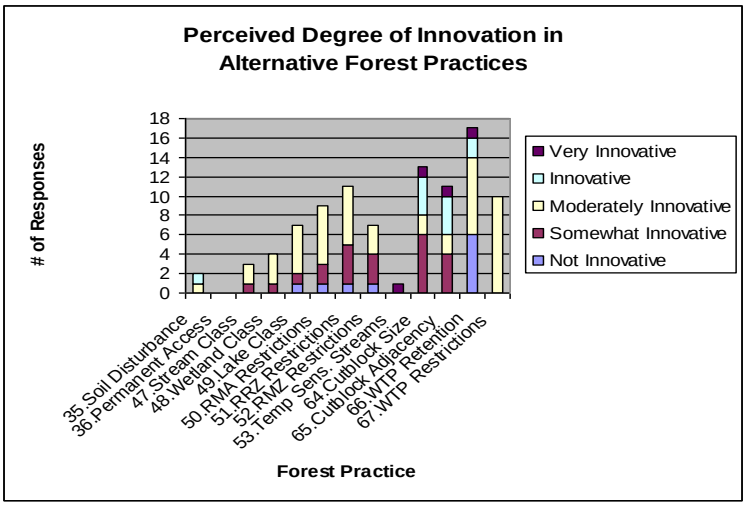


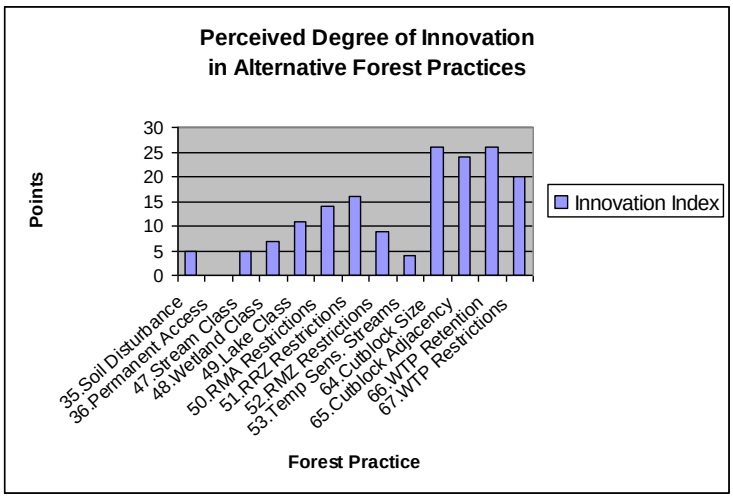
Some of the 'other' reasons cited by respondents for developing alternative practices include:

- To incorporate Okanagan Shuswap LRMP direction into results and strategies;
- To create flexibility to address site-specific concerns where the default practice requirement did not appear to have the desired flexibility;
- To develop practices (planting, managing and harvesting) that are more appropriate for the management of short-lived deciduous species (current practices have been developed for coniferous species);

Question 4: *Where alternative practices were approved – what is the perceived degree of innovation in the alternative practices?*

As outlined in Figures 8 and 9 below, respondents identified the greatest amount of innovation in landscape and stand level biodiversity objectives, followed by moderate levels of innovation in riparian management practices.





2. Response to Requirement to Develop Results and Strategies (no default practices or guidance provided)

Riparian Management Zones (RMZ's) are one example of an area where major forest tenure holders are required to identify the practices they intend to pursue, without being provided with default practice requirements. (Minor tenure holders by comparison are obligated to implement practice requirements identified under FRPA.) The range of variation and degree of innovation in RMZ practices proposed by major tenure holders is assessed to determine the response to this regulatory approach.

Question 5: *What practices are being proposed by major tenure holders for Riparian Management Zones under FRPA?*

Of the 65 approved FSP's that were reviewed in this project, 22 (34%) committed to undertake the practice requirements identified in S. 52(1) of the FPPR for minor tenure holders (or committed to the equivalent practices). (Note: 4 of these FSP's are for major tenure holders).

For the remaining 43 'major tenure holder' FSP's, RMZ practices can be categorised into three basic approaches, as outlined in Table 3 below.

Table 3: Examples of Different Approaches to Riparian Management Zone Practices

Approach	Description / Examples
i. No (or few) RMZ commitments – practices to be defined at a site level	▪ 18 FSP's (28%) did not specify commitments for retention within RMZ's, but instead committed to identifying RMZ practices prior to harvest, stating that the practices will be based on the factors outlined in Schedule 1 of the FPPR for the management of riparian areas. Some of these FSP's committed to hiring a professional to develop RMZ prescriptions. ▪ 3 FSP's identified commitments to retain some trees in (eg 10 trees per 100 metres stream length in S4 stream RMZ's and non-merchantable trees within S5 and S6 RMZ's), but did not specify commitments for remaining riparian classes of streams, lakes and wetlands.
ii. Targets for RMZ retention defined by riparian class	▪ 6 FSP's specified commitments for retention within riparian management zones by riparian class, expressed as either % of basal area to be retained (3), % of trees (1), % of RMZ area to be greater than 20 years old (1) or % of pre-harvest stand (1). ▪ 2 FSP's identified actual target levels of basal area retention (m2/ha) to be retained within RMZ's, while 1 FSP specified a target number of stems/ ha to be retained within RMZ's, by riparian class. ▪ Targets for retention either reflect a minimum acceptable level (ie. > or = 30%) or a range of acceptable conditions (ie. 0-30%).
iii. Targets for RMZ retention defined by riparian class and other criteria	▪ 13 FSP's identified commitments for retention within riparian management zones that vary based on riparian class and the risk of windthrow. Higher levels of retention are generally reflected along larger, fish-bearing streams, and in areas of moderate to high windthrow, while smaller, non-fish bearing streams and areas of low windthrow risk often reflect low or zero target levels for RMZ retention. ▪ An additional 3 FSP's identified RMZ practices based on riparian class, risk of windthrow, and other criteria such as water quality objectives, temperature sensitive streams, critical wildlife habitat, stream order, valley bottom location and importance of woody debris/stream side trees. ▪ Retention targets are expressed as either % of basal area to be retained (10) or % of RMZ area to be retained (6).

How do RMZ practices identified by major tenure holders compare to the FRPA standards for minor tenure holders?

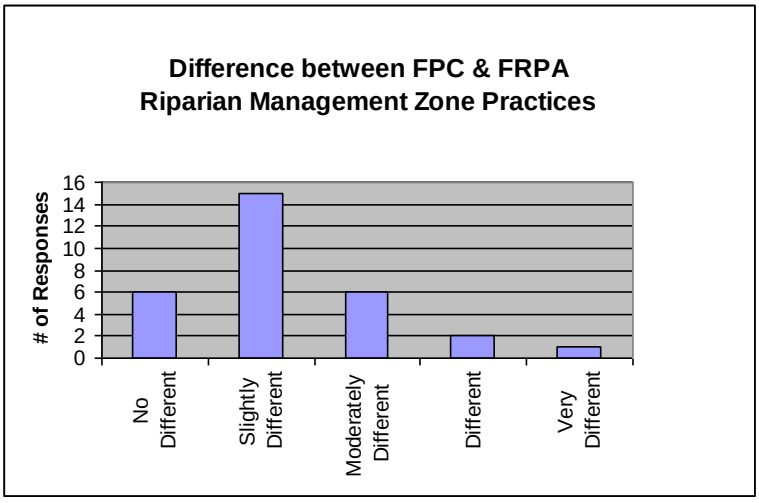
For most FSP's It is difficult (if not impossible) to assess the standards being proposed for RMZ management (in terms of overall amount of retention) relative to the practice requirements expressed for minor tenure holders or the standards of the former FPC.

There are a few FSP's that make express commitments to minimum levels of retention that exceed the practice requirements for minor tenure holders (S.52(1)). These appear to be a reflection of commitments made for riparian management in the Okanagan-Shuswap LRMP area. There are also a couple of FSP's that identify minimum levels of retention that are lower than the requirements specified in 52(1).

However the majority of FSP's either identify a range of acceptable levels of retention or do not commit to any target or minimum level. It will only be possible to assess the standards for RMZ practices through monitoring and assessment of actual implementation in the field.

Question 6: *What is the perceived degree of difference between RMZ practices required under the FPC, and RMZ practices proposed under FRPA?*

On average, respondents believe that riparian management practices proposed under FRPA are ***slightly different*** than those that were implemented under the Forest Practices Code (Figure 10).

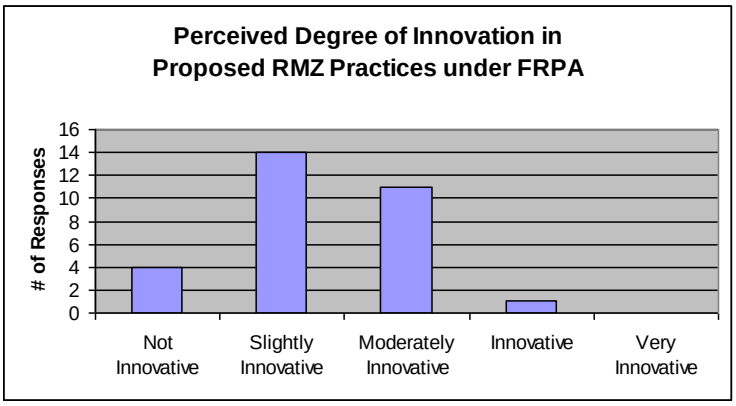


Average	**1.2**
Median	**1**

0 = No Change

Question 7: *What is the perceived degree of innovation in proposed riparian management zone practices under FRPA?*

On average, respondents believe that riparian management practices proposed under FRPA are ***slightly innovative*** (Figure 11).

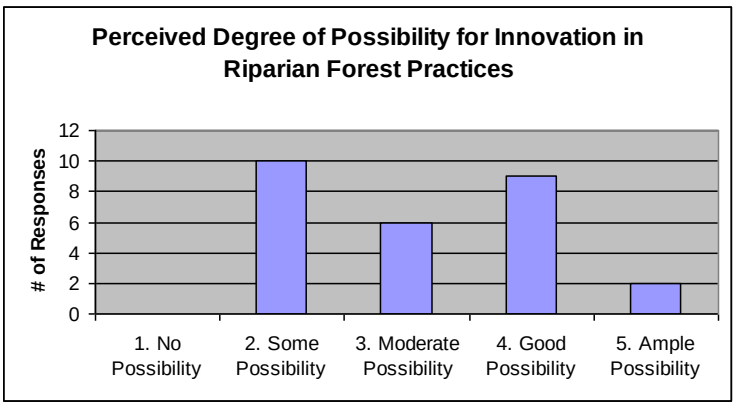


Average	**1.3**
Median	**1**

0 = Not Innovative

***Question 8**: What do licensees perceive is the degree of possibility for implementing alternative and innovative RMZ practices?*

On average, respondents believe that there is a ***moderate degree of possibility*** for identifying and implementing alternative riparian management practices (ie. there are alternative approaches possible for management of this value) (Figure 12).

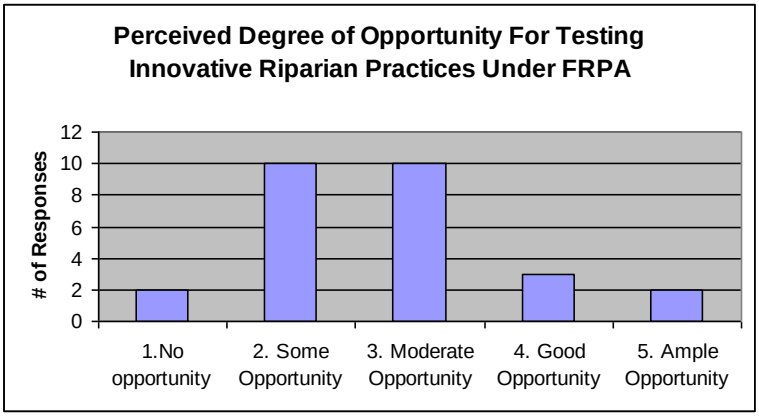


Average	**2.1**
Median	**2**

0 = No Possibility

***Question 9:** What do licensees perceive is the degree of opportunity for testing innovative riparian practices under FRPA?*

On average, respondents believe that there is a ***moderate degree of opportunity*** for testing innovative riparian practices under FRPA (Figure 13).



Average	**1.7**
Median	**2**

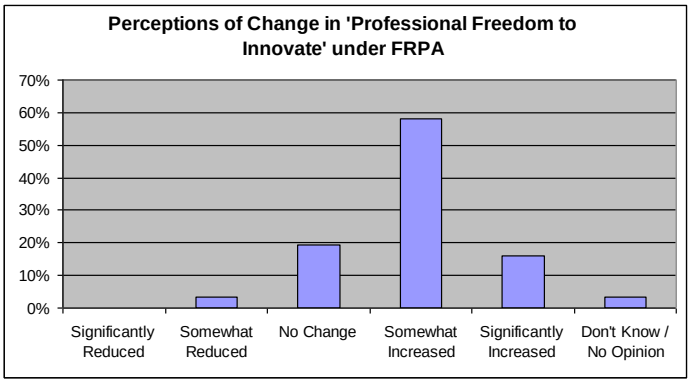
0 = No Opportunity

3. Assessing the Factors that Have Influenced Licensee Decisions

3.1 Perceptions Related to Innovation and Opportunities for Innovation under FRPA

Question 10: *Do licensees perceive that FRPA provides the opportunity to test innovative forest practices?*

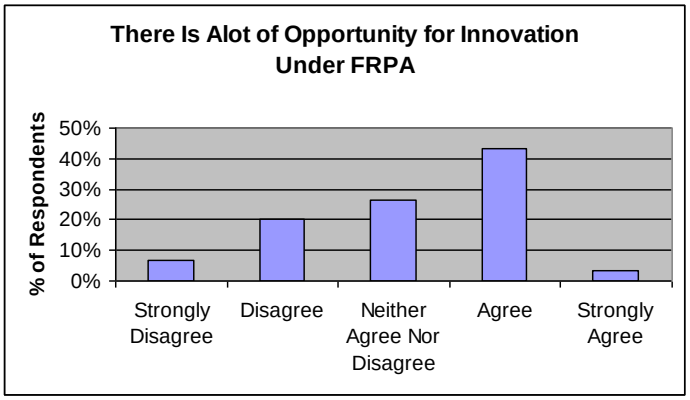
On average, respondents believe that FRPA has *somewhat increased* their professional freedom to innovate (Figure 14). They disagree with the statement that FRPA allows for too much innovation (Figure 15), but on average they neither agree nor disagree with the statement that there is a lot of opportunity for innovation under FRPA (Figure 16).



Average	**0.90**
Median	**1**

-2 = Significantly Reduced

-1 = Somewhat Reduced

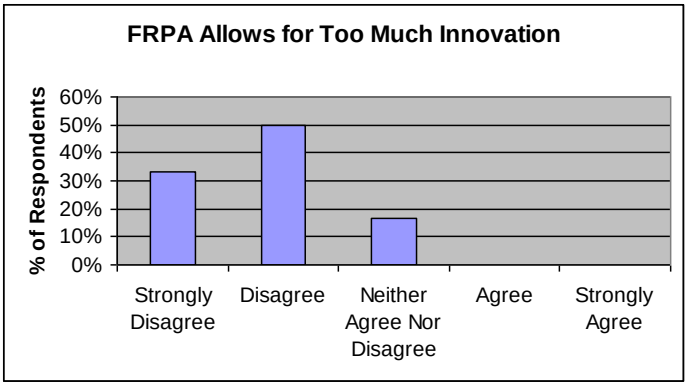


Average	**0.19**
Median	**0**

-2 = Strongly Disagree

-1 = Disagree

0 = Neither Agree Nor

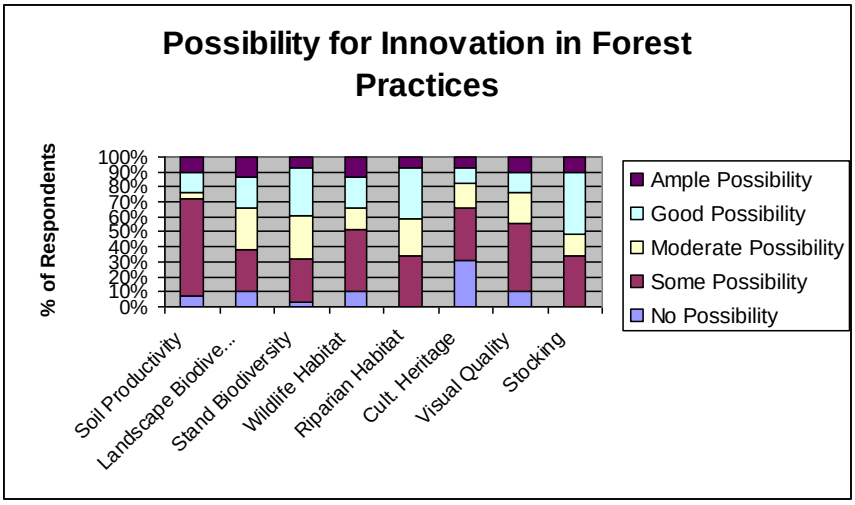


Average	**-1.17**
Median	**-1**

-2 = Strongly Disagree

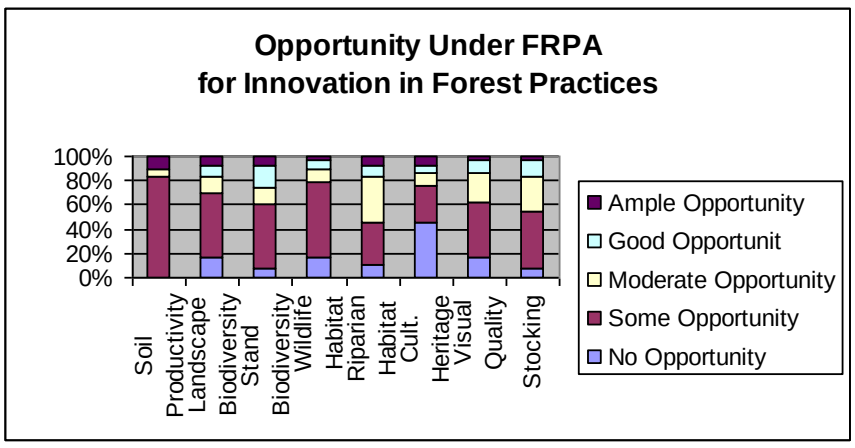
-1 = Disagree

With respect to the possibility for innovation in forest practices, respondents identified stocking standards / regeneration as an area of practice with the greatest possibility for innovation (good possibility). There is perceived to be a moderate possibility for innovation in practices for managing riparian areas and landscape and stand level biodiversity, and just some possibility for innovation in practices for maintaining soil productivity, wildlife habitat, cultural heritage values and visual quality (Figure 17).



	Avg	Med
Soil	**1.55**	**1**
Land Bio	**2.00**	**2**
Stand Bio	**2.11**	**2**
Habitat	**1.86**	**1**
Riparian	**2.14**	**2**
Cult. Her	**1.28**	**1**
Visual	**1.69**	**1**

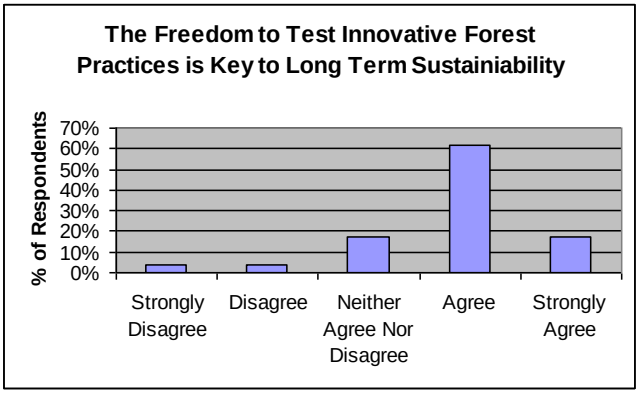
In terms of the actual opportunity provided by FRPA for innovation in practices, respondents believe there is a moderate opportunity for innovation in riparian management practices, but only some opportunity for innovation in all other practices. These two figures would indicate that for several values there is a possibility for innovation, but FRPA does not clearly provide the opportunity (Figure 18).



	Avg	Med
Soil	**1.38**	**1**
Land Bio	**1.38**	**1**
Stand Bio	**1.64**	**1**
Habitat	**1.17**	**1**
Riparian	**1.69**	**2**
Cult. Her	**1.00**	**1**
Visual	**1.38**	**1**

Question 11: *How do licensees view the importance of innovation in forest practices?*

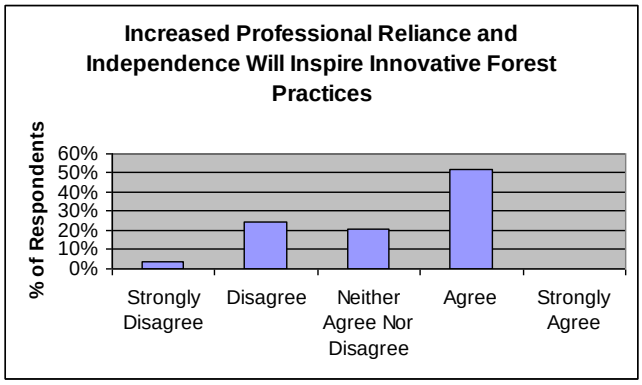
On average, respondents agree with the statement that the freedom to test innovative forest practices is key to long term sustainability (Figure 19). They only slightly agree that increased professional reliance will inspire innovative forest practices (Figure 20). They agree that large forest companies are more likely to test innovative forest practices (Figure 21).



Average	**0.83**
Median	**1**

-2 = Strongly Disagree

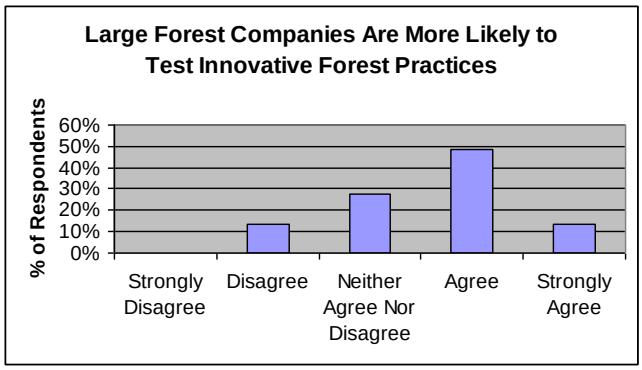
-1 = Disagree



Average	**0.2**
Median	**0.5**

-2 = Strongly Disagree

-1 = Disagree



Average	**0.6**
Median	**1**

-2 = Strongly Disagree

-1 = Disagree

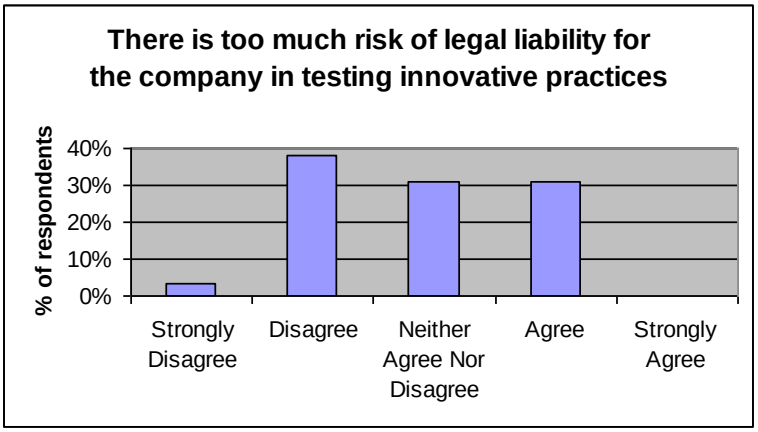
***Question 12**: How do licensees view the risk associated with testing innovative forest practices?*

While there is a spectrum of opinion, on average respondents disagree with the statement that there is too much professional risk involved in testing innovative practices (Figure 22), and neither agree nor disagree with the statement that there is too much risk of legal liability for the company (Figure 23). Generally there does not appear to be a high level of concern with professional or company risk associated with testing innovative forest practices.

Average	**-0.47**
Median	**-1**

-2 = Strongly Disagree

-1 = Disagree



Average	**-0.13**
Median	**0**

-2 = Strongly Disagree

-1 = Disagree

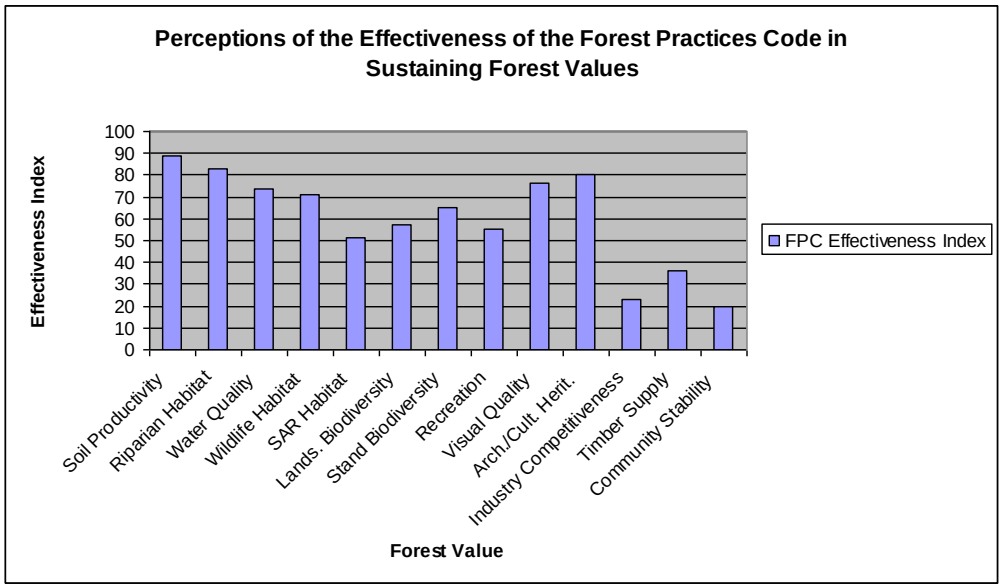
3.2 Perceptions of the Forest Practices Code and Current Forest Management

***Question 13:** How effective do licensees think the forest practices required by the Forest Practices Code (FPC) have been in maintaining various forest-related values.*

As outlined in Table 4 and Figure 24, respondents believe that the practices required by the Forest Practices Code (which are largely the same as the default forest practices under FRPA) have been effective for maintaining soil productivity, riparian habitat, water quality, wildlife habitat, visual quality and archaeological and cultural heritage values. They believe that FPC practices have been somewhat effective in maintaining habitat for species at risk, landscape level biodiversity, stand level

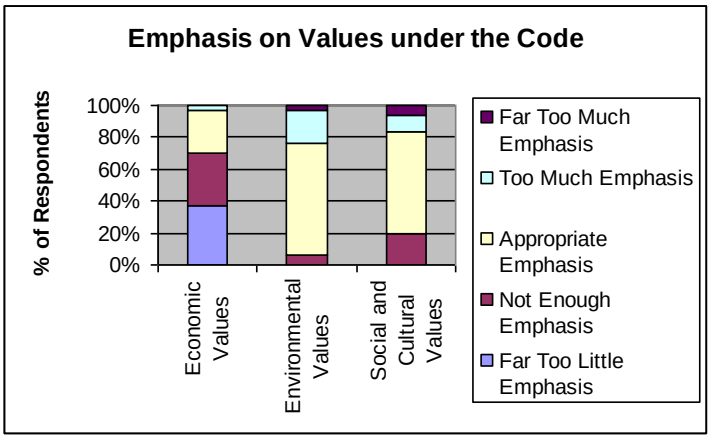
biodiversity and recreation values. By comparison they believe the FPC has been only slightly effective in maintaining timber supply and community stability and industry competitiveness.

	% Responses by Response Category						
Forest-Related Value	**Not Effective (0)**	**Slightly Effective (1)**	**Somewhat Effective (2)**	**Effective (3)**	**Very Effective (4)**	**Don't Know / No Opinion**	**Average (Scale of 0-4)**
Soil Productivity	0%	0%	10%	**59%**	28%	3%	**3.2**
Riparian Habitat	0%	7%	17%	**57%**	17%	3%	**2.9**
Water Quality	3%	13%	20%	**47%**	13%	3%	**2.6**
Wildlife Habitat	3%	10%	27%	**53%**	3%	3%	**2.4**
SAR Habitat	17%	13%	**33%**	30%	0%	7%	**1.8**
Lands. Biodiversity	13%	7%	**30%**	37%	3%	10%	**2.1**
Stand Biodiversity	0%	23%	**33%**	33%	7%	3%	**2.2**
Recreation	10%	3%	**53%**	20%	3%	10%	**2.0**
Visual Quality	7%	0%	17%	**60%**	10%	7%	**2.7**
Archaeology/ Cultural Heritage	3%	3%	3%	**63%**	17%	10%	**3.0**
Industry Competitiveness	50%	**10%**	27%	0%	3%	10%	**0.7**
Timber Supply	27%	**30%**	23%	10%	3%	7%	**1.3**
Community Stability	43%	**27%**	10%	7%	0%	13%	**0.8**



Question 14: *How do licensees perceive the balance of values provided by the Forest Practices Code and the Forest and Range Practices Act*

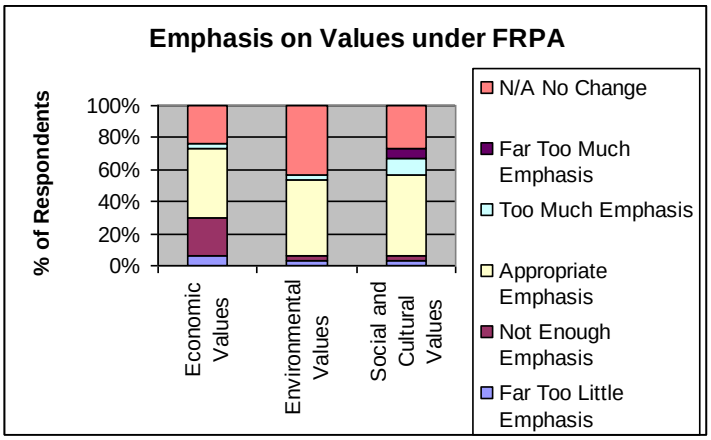
As outlined in Figure 25 below, respondents believe on average that the Forest Practices Code provided an appropriate level of emphasis on environmental and social values, but not enough emphasis on economic values. By comparison, they believe that the Forest and Range Practices Act provides for an appropriate emphasis on all three values (Figure 26).



Median Values

Economic = Not Enough Emphasis

Environmental = Appropriate Emphasis



Median Values

Economic = Appropriate Emphasis

Environmental = Appropriate Emphasis

Question 15: *What are licensees views regarding forest land management and the environment in BC generally?*

Table 5 below outlines respondent's views regarding forest land management and the environment in BC generally.

	% (and #) of Responses by Response Category						
	Strongly Agree (1)	Agree (2)	Neither Agree Nor Disagree (3)	Disagree (4)	Strongly Disagree (5)	Don't Know/ No Opinion	**Average (Scale of 1-5)**
There are enough checks and balances in place (eg. legislation, professional ethics, forest certification) to ensure responsible forest management	33.3% (10)	**60.0% (18)**	0.0% (0)	0.0% (0)	6.7% (2)	0.0% (0)	**1.87**
The forest industry controls too much of the British Columbia land base	6.7% (2)	3.3% (1)	16.7% (5)	**43.3% (13)**	30.0% (9)	0.0% (0)	**3.87**
British Columbia has enough protected areas such as provincial and national parks	33.3% (10)	**46.7% (14)**	13.3% (4)	6.7% (2)	0.0% (0)	0.0% (0)	**1.93**
The citizens of BC need to have more opportunities for input into forest management	3.3% (1)	13.3% (4)	36.7% (11)	**40.0% (12)**	6.7% (2)	0.0% (0)	**3.33**
If forests are well managed to protect aesthetic values, the ecosystem is being managed well also	3.3% (1)	3.3% (1)	13.3% (4)	**43.3% (13)**	36.7% (11)	0.0% (0)	**4.07**
Providing long term security of forest lands to forest companies will promote sustainable forest management	40.0% (12)	**46.7% (14)**	3.3% (1)	6.7% (2)	3.3% (1)	0.0% (0)	**1.87**
Forest management currently focuses too much attention on timber resources and not enough attention on non-timber resources (eg. recreation, visual quality)	3.3% (1)	6.7% (2)	6.7% (2)	**60.0% (18)**	23.3% (7)	0.0% (0)	**3.93**
There will be sufficient wood in BC to meet our future needs	11.1% (3)	**51.9% (14)**	3.7% (1)	29.6% (8)	3.7% (1)	0.0% (0)	**2.63**
Forest companies have earned the trust to manage forests for the long term	0.0% (0)	24.1% (7)	**51.7% (15)**	17.2% (5)	6.9% (2)	0.0% (0)	**3.07**

Question 16: What are licensee's perceptions of the degree of change under FRPA (relative to operations under the FPC) with respect to the variables outlined in Table 6 below?

The expressed goals of FRPA were to reduce operational planning costs and administrative complexity, increase professional accountability and professional freedom to innovate, while maintaining the same environmental standards and public confidence in forest management.

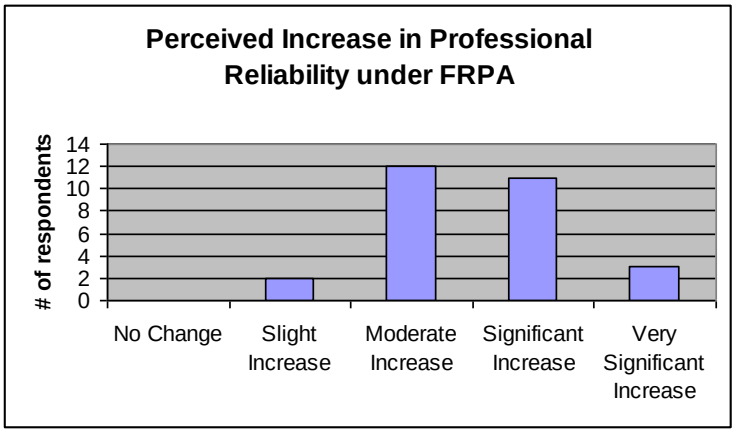
As outlined in Table 6 below, respondents believe (on average) that operational planning costs and administrative complexity have actually somewhat increased under FRPA, while there has been no change with respect timelines for operational planning and plan approval. Consistent with the stated FRPA goals, respondents believe that the professional freedom to innovate has somewhat increased and professional accountability has significantly increased, while environmental standards have remained the same. However, in the opinion of respondents, public confidence in forest management is somewhat reduced relative to operations under the FPC.

	Signifi-cantly Reduced (1)	**Somewhat Reduced (2)**	**No Change (3)**	**Somewhat Increased (4)**	**Signifi-cantly Increased (5)**	**Don't Know / No Opinion**	**Rating Average**
Operational Planning Costs	0.0% (0)	25.0% (7)	21.4% (6)	**32.1% (9)**	21.4% (6)	0.0% (0)	**3.5**
Administrative Complexity	6.9% (2)	24.1% (7)	17.2% (5)	**24.1% (7)**	27.6% (8)	0.0% (0)	**3.41**
Professional Accountability	0.0% (0)	0.0% (0)	20.7% (6)	24.1% (7)	**55.2% (16)**	0.0% (0)	**4.34**
Professional Freedom to Innovate	0.0% (0)	3.4% (1)	17.2% (5)	**58.6% (17)**	20.7% (6)	0.0% (0)	**3.97**
Environmental Standards	3.4% (1)	6.9% (2)	**65.5% (19)**	20.7% (6)	3.4% (1)	0.0% (0)	**3.14**
Public Confidence	11.1% (3)	**48.1% (13)**	29.6% (8)	7.4% (2)	3.7% (1)	0.0% (0)	**2.44**
Timelines for Operational Planning	3.7% (1)	33.3% (9)	**18.5% (5)**	25.9% (7)	18.5% (5)	0.0% (0)	**3.22**
Timelines for Plan Approval	7.1% (2)	21.4% (6)	**25.0% (7)**	28.6% (8)	17.9% (5)	0.0% (0)	**3.29**

3.3 PERCEPTIONS OF PROFESSIONAL ACCOUNTABILITY AND LIABILITY

Question 17: *Do licensees perceive a change in professional and company liability under FRPA, and how does it affect their willingness to innovate?*

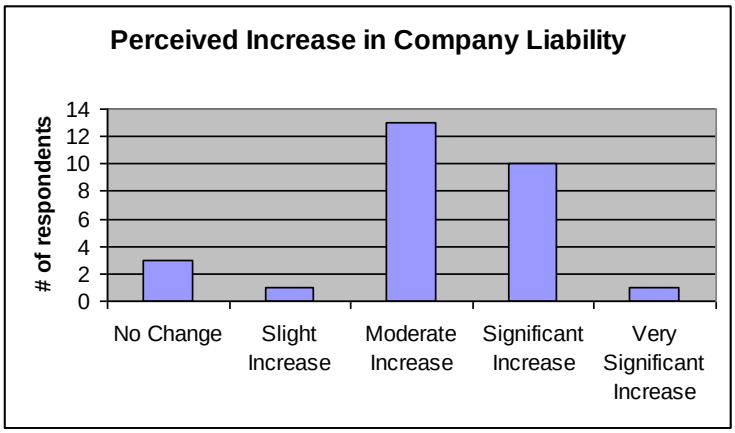
As noted in Figures 27-30 below, respondents believe that there has been a moderate to significant increase in professional liability under FRPA, and a moderate increase in company liability. Increased professional liability makes them only slightly less willing to test innovative practices.



Average	**2.5**
Median	**2**

0 = No Change

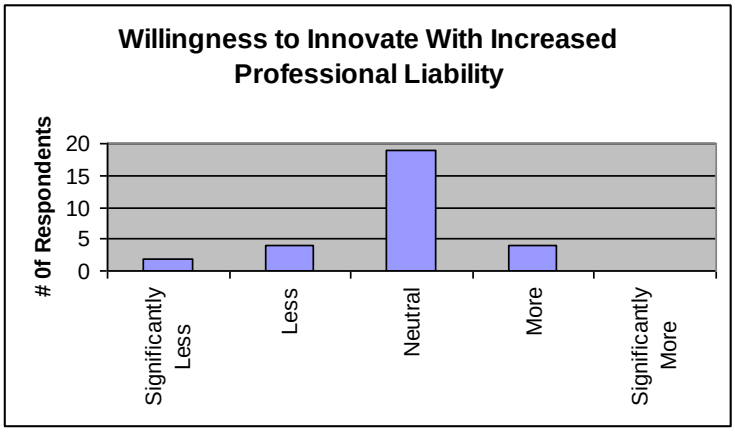
1 = Slight Change



Average	**2.2**
Median	**2**

0 = No Change

1 = Slight Change



Average	**-0.2**
Median	**0**

-2= Significantly Less

-1 = Less

Question 18: *What are licensees' views with respect to professional reliance and the role and influence of various professionals under FRPA?*

As outlined in Table 7 below, respondents agree that the role and influence of all professionals (foresters, biologists, engineers, agrologists and lawyers) has increased under FRPA. With respect to professional independence, they disagree that foresters make decisions independent of their client or employer, and they agree that the interest of clients or employers strongly influence decisions made by foresters. However, they agree that increased professional reliance and independence will improve the quality of forest management, and that professional foresters should be trusted to represent the public interest in forest management.

	Strongly Agree (1)	**Agree (2)**	**Neither Agree Nor Disagree (3)**	**Disagree (4)**	**Strongly Disagree (5)**	**Don't Know**	**Rating Average**
The role and influence of professional foresters has increased under FRPA	13.3% (4)	**66.7% (20)**	16.7% (5)	0.0% (0)	3.3% (1)	0.0% (0)	2.13
The role and influence of professional biologists has increased under FRPA	10.3% (3)	**58.6% (17)**	24.1% (7)	6.9% (2)	0.0% (0)	0.0% (0)	2.28
The role and influence of professional engineers and geoscientists has increased under FRPA	3.4% (1)	**51.7% (15)**	34.5% (10)	10.3% (3)	0.0% (0)	0.0% (0)	2.48
The role and influence of agrologists has increased under FRPA	4.3% (1)	**47.8% (11)**	47.8% (11)	0.0% (0)	0.0% (0)	0.0% (0)	2.43
The role and influence of lawyers has increased under FRPA	22.2% (6)	**51.9% (14)**	22.2% (6)	3.7% (1)	0.0% (0)	0.0% (0)	2.07
Professional foresters make FSP decisions independent of their client or employer	0.0% (0)	30.0% (9)	26.7% (8)	**36.7% (11)**	6.7% (2)	0.0% (0)	3.20
The interests of clients or employers strongly influence the forest management decisions made by professional foresters	10.0% (3)	**50.0% (15)**	26.7% (8)	13.3% (4)	0.0% (0)	0.0% (0)	2.43
Increased professional reliance and independence will improve the quality of forest management	6.7% (2)	**60.0% (18)**	16.7% (5)	10.0% (3)	6.7% (2)	0.0% (0)	2.50
Professional foresters have too much discretion and authority under FRPA	0.0% (0)	0.0% (0)	17.2% (5)	**62.1% (18)**	20.7% (6)	0.0% (0)	4.03
Professional foresters should be entrusted to represent the public interest in forest management decisions	26.7% (8)	**50.0% (15)**	20.0% (6)	3.3% (1)	0.0% (0)	0.0% (0)	2.00

Question 19: *What is the role and influence of various professionals in developing the Forest Stewardship Plan.*

As noted in Tables 8-11 below, 37% of respondents engaged lawyers to provide legal advice on their FSP, and the advice was somewhat influential on the FSP. 63% did not engage legal advice. The majority of respondents did not engage the services of an agrologist (80%) or professional engineer (83%) in the development of the FSP. By comparison, most respondents did engage the services of a biologist (56%) or a forest technologist (73%). With respect to the role of the tenure holder in FSP decision-making, the majority of respondents (70%) indicated they either develop the FSP independently, or they receive strategic advice from the tenure holder and then develop the FSP independently. Only 27% indicated that the FSP is jointly developed between the tenure holder and themselves.

(Note: respondents seem to indicate they develop FSP's independent of their employer, yet in response to Question 18 above they indicate that foresters generally do not make decisions independent of their client or employer).

Received Legal Advice on FSP

19	63%	No
11	37%	Yes

Influence of Legal Advice Received

2	18%	Of little influence
6	55%	Somewhat influential
2	18%	Influential
1	9%	Very Influential

Role of Professionals in FSP Development

	Biologists		Engineers/ Geoscientists		Agrologists		Forest Technologists		Lawyers	
1. No involvement	13	43%	25	83%	24	80%	8	27%	17	57%
2. Provided professional advice / recommendations on selected aspects of the plan	15	50%	5	17%	5	17%	15	50%	11	37%
3. Engaged in joint planning and decision-making for most or all of the plan	1	3%	0	0%	0	0%	6	20%	1	3%
4. Other	1	3%	0	0%	1	3%	1	3%	1	3%

Roles in FSP development – Tenure Holder and Prescribing Forester

9	**30%**	I (prescribing forester) have complete discretion and authority to develop the FSP and determine forest management direction
12	**40%**	I receive strategic guidance from the tenure holder and then develop the FSP independently
8	**27%**	Forest management decisions are jointly made by myself and the tenure holder
1	**3%**	Forest management decisions are frequently made by the tenure holder. My role is to review and provide advice

Question 20: *Did licensees choose to certify portions of their FSP under Section 16 of the Forest and Range Practices Act? Why or why not?*

Table 12 below summarizes the number of respondents (out of 30) who chose to certify sections of their FSP under Section 16.

	# of respondents	% of respondents
The map referred to in section 5 (1) (a) (ii) of the Forest and Range Practice Act shows the boundaries of all applicable forest development units.	9	30%
The intended results or strategies, specified in the plan, in relation to the objective set by government for visual quality under section 9.2 of the Forest Planning and Practices Regulation are consistent with that objective.	7	23%
The plan accurately specifies the forest development units, the areas, and the cutblocks in accordance with section 14 (1) of the Forest Planning and Practices Regulation.	9	30%
In accordance with section 14 (2) of the Forest Planning and Practices Regulation, the plan accurately identifies for those forest development units, the things set out in section 14 (3) of the Forest Planning and Practices Regulation.	9	30%
In accordance with section 14 (4) of the Forest Planning and Practices Regulation, the plan accurately describes each area that is identified in it as a declared area.	5	17%
The measures specified in accordance with section 17 of the Forest Planning and Practices Regulation for the plan, to prevent the introduction or spread of species of plants prescribed in the Invasive Plants Regulation, will be effective.	8	27%
The measures specified in accordance with section 18 of the Forest Planning and Practices Regulation for the plan, to mitigate the effect of removing or rendering ineffective natural range barriers, will be effective.	6	20%
The free growing height referred to in section 44 (1) (b) of the Forest Planning and Practices Regulation is appropriate, and is of sufficient height to demonstrate that the tree is adapted to the site, is growing well and can reasonably be expected to continue to do so.	9	30%
The intended results of strategies, specified in the plan, in relation to an objective set by government for visual quality, are consistent with that objective.	6	20%
The intended results of strategies, specified in the plan, in relation to a visual quality objective, are consistent with that objective.	6	20%

Comments from respondents as to why they chose to certify or not, are outlined below.

- The certification provision came into being after the original FSP was approved. The certification provision is seen to be redundant. Why certify individual sections when a professional is already signing off the entire plan and its contents. Sounds like a good idea, but the reality is that it doesn't buy the developer anything. DDM still scrutinizes the FSP to the fullest extent in our experience. Wouldn't matter if a section is certified or not.
- Why bother? There's nothing to be gained and we are WAY too early in the application of FRPA to understand how this may work - stay tuned for future "certifications" on these items.
- Complexity. Not well understood. Liability to signing forester.
- I am confident that the FSP conforms to section 5 and that the results or strategies when implemented will meet OSBG.
- Certification was/is intended to recognize professional practice and encourage approval by the SDM.
- I wrote and signed the FSP myself. No need to certify
- There did not appear to be a need to certify. I also had some concern with the certifier being able to meet the 'expert' test (ie this is a new type of plan and regime so who would qualify as experienced in both the subject matter and the new legislation), while maintaining costs for FSP development. I expected our FSP to receive a lot of critical review from environmentalists and did not think it was fair to ask a professional to personally take on additional scrutiny. The benefit to risk ratio was not worth the extra cost and effort.
- I signed and sealed the whole thing.
- Certified on the basis that this would simplify the MoFR review process - this did not occur. Would not certify again unless there was a very specific reason.
- Seemed redundant
- Visuals are too risky to try and do much with except on a case by case basis.
- Did not see any advantages for certifying.
- More peer review is better than less. We were the first plan submitted for approval in our district. We wanted discussion with the DDM and his reviewers.
- We were out of the gate early in the process. Couldn't see the point in certifying certain sections at that time - by signing the FSP, I was taking responsibility for the document, the R&S, and all involved, so the leg at that time, didn't give any real advantage. Now however, given the attention paid to certain elements of our FSP by the DDM review team, and their reticence to approve sections involving professional reliance and judgement, I can see the advantage - would go this way on the next one for sure.
- It was a request from the Forest District and as the person signing the FSP, I felt comfortable providing this extra certainty to the District.

3.4 Profile of Respondents:

i. Employer

Self-Employed / Own Company	13%	4
Consulting Firm	10%	3
Forest Company	60%	18
Government (BCTS)	17%	5

ii. Employment Level

Company Owner	13%	4
Manager or Senior Executive	30%	9
Employee	57%	17

iii. Company Size

Very Small (<10 employees)	23%	7
Small (10-25 employees)	7%	2
Moderate Size (25-50 employees)	20%	6
Large (50-100 employees)	13%	4
Very Large (100+ employees)	37%	11

iv. Tenure Type

Community Forest License	3%	1
Tree Farm License	10%	3
Forest License	57%	17
BCTS Operating Area	17%	5
Other -2 NRFL -2 have more than one type of tenure	13%	4

iv. Forest Region

Coast	52%	14
Southern Interior	30%	8
Northern Interior	19%	5
No response to this question		3

v. Gender

Male	73%	19
Female	27%	7
No response to this question		4

vi. Company Certification

ISO	32%	6
CSA	16%	3
SFI	32%	6
FSC	0	0
Other -3 CSA & ISO -1 SFI & ISO	21%	4
Total		19

Question 21: *Open-ended Responses to the Closing Question - Would you like to offer any comments on how effective you believe the results-based Forest and Range Practices Act will be in fostering innovative forest practices and professional freedom to manage?*

- As FRPA gets used, it will effect more and more opportunities for innovation. Smaller (and new) licensees want to get their FSPs in place first, with a plan to consider/submit FSP amendments to allow innovation. Very few people have actually been working under the FRPA regime, so conclusions about its effectiveness will likely be premature (other than confirmation that FRPA provides an avenue for innovation). There is still a culture shift required (agencies and licencees) for successful implementation of FRPA.
- I believe that the results-based FRPA is an excellent opportunity for forest professionals to be innovative. What I am seeing, however, is that professionals are so used to being told how to do things that they fail to see and take advantage of this opportunity. Hopefully, this will change over time as individuals become more comfortable with making their own decisions and can see the innovations that other professionals have carried out.
- I think it will encourage innovative forest practices in the longer term but as professionals shift into this new regime in the short term, I believe they will be more cautious in prescribing innovative practices.
- The results-based FRPA has not made much difference. Improved or innovative forest management comes from a desire by the company, shareholders, and its personnel to do good and innovative work. A TFL managed poorly under the code will likely be managed worse under FRPA. A well managed TFL under the code will be managed equally well under FRPA.
- Today, I do not see a difference from the FPC to FRPA. Most local professionals are defaulting to FPC practices as a measure of Due Diligence. Perhaps this will change as new practices become the 'norm' for local industry. It should be noted that while everyone is talking about innovative practices as being a product of FRPA, the ability to employ or test new practices is limited by DDM's approvals of alternative results and strategies. To date in the local area, licensees have avoided alternates as it is deemed to be a major roadblock to FSP approvals. As a result, the perceived benefits of professional freedom are not really available the way people would like to think they are as made available in FRPA. FRPA also provides government with a multitude of ways of boxing in practices through GAR which is not unlike the limitations included in the FPC.
- Depends on the philosophy of the individual, support of the company and economics of the day.
- To date, not so much - the legislation is new, and I expect there will be more innovation as time goes on. For some of the questions, it asks whether a particular legislation was effective (e.g. was the FPC successful at maintaining timber supply) - I don't think that this has to do entirely with the FPC - there are other considerations that are more influential on this.
- All comes down to the mighty buck.
- Until government truly buys into the idea, innovation will be minimal. At the District level I have found heavy resistance from government staff to let go of the 'approver' role, and little appetite to allow professionals to manage the resource.
- I believe that in a time where innovative forest practices should be employed, a certain time constraint was first and foremost in tenure holders minds. Ensuring companies had an approvable FSP in order to continue operations was more important than developing innovative practices. The time that it takes to back up innovative results and strategies in order to ensure they are measurable and approvable is considerable and thus, often this is a deterrent. I would hope that once the province has all of these operational plans in place, Licensee's will consider and develop more innovative R/S to further the knowledge and understanding of the forests, ecosystems and resources around us.
- I've noticed that a lot of people perceive the default practice requirements as 'minimums'. This is not correct. They are standards available to meet the objective. I think that as professionals and

organizations (govt and industry) become more familiar and comfortable with the legislation, the application of innovative practices will increase.

- We were the first to submit and obtain approval for an FSP in our district, however all things being equal, I think it will approximately one FSP business cycle (5 years) before true innovation will occur as licensees are generally behind in submitting FSPs. Unfortunately, all things will not be equal in 5 years, and the shift to professional reliance, which in many cases means a shift in cost and liability to the industry, may not have occurred at the best time for the industry. The diminished financial health of the forest sector, compounded by rapid change and uncertainty reduces the impetus for innovation and ability for a company to justify the R/D investment/added risk in developing innovative strategies. There are increasing job vacancies, high staff turnovers, large numbers of retirements, industry consolidations, large AAC impending reductions (e.g. MPB, EBM), organizational restructurings, legal changes (forest revitalization), significantly diminished recruitment, Bill 28, tenure uncertainty (land claims), and other compounding pressures on the landbase (e.g. FROs). With the Forest Revitalization act changes there are also increased pressures to move Schedule A TFL Private Lands into fee simple or Private Managed Forest Lands. As a result of these compounding changes, forest professionals are taking on largely increased workloads and are needing to work smarter and much harder. Professionals are generally being asked to do more with less. In many cases this means not having the luxury of time to ponder and deliberate, discuss, and design and implement, and take on the added risk associated with proper adaptive management trials needed to fulfill the burden of proof for alternative strategies.
- We have been working under FRPA for only two months so it is much too early to make clear responses to many of the questions. It would be interesting to see how the responses to these questions would change after working under FRPA for a year or so.
- We'll see. So far there has been a reluctance on the part of Ministry of Forest staff to rely on professionals and the acceptance that there is always some level of risk associated with trying new and innovative practices
- My main concerns revolve around the approval process and the subsequent C&E concept of interpretation. The non-default strategies have been watered down because MoF have very low risk tolerance and are not innovative about forest management. The amount of energy going into the process of auditing FSP compliance suggests that the MoF are not confident in the ability or ethics of industry professionals. Until this changes and the MoF stop tying to micro manage and second guess what is happening RPF's will not have the ability to be innovative and move BC forward into a progressive forest management culture.
- The effectiveness of FRPA will not be realized for a few years. Innovative practices will take time to gain acceptance with plan approvers. The reality of today is that plan preparers are first tasked with getting an FSP approved and then tasked with achieving gains in flexibility. Time constraints dictate that only the first goal can be achieved in most cases prior to the deadline for approval.
- From what I have seen, not at all. If the MoF DDMs and crew can not stop insisting on things being done their way.
- Although FRPA has opened the door to limited innovation, the licensees are still very restricted by Ministry policy as every R/S etc. has to be approved by the MoFR.

APPENDIX 3: PHONE INTERVIEW QUESTIONS

A. Interview Questions for Prescribing Foresters

1. How would you define an innovative forest practice?
2a. In your FSP, you committed to alternative practices for xx and xx. In the web survey you described those practices as xx (degree of innovation). Can you describe for me what those practices are and why you have characterized them as innovative?
OR
2b. In your FSP, you have committed to implement all of the default practices for riparian management and biodiversity. Can you elaborate on why you are opting to implement the default practices?
3. To what extent does your FSP accurately reflect the forest practices that will be implemented in the field? Are there practices you may be implementing that are not described in the FSP?
4. To what extent has FRPA provided a driver for your proposed alternative practices?
5. To what extent did you research and evaluate alternative forest practices? How did you undertake this research? How did you assess the costs and benefits of alternatives?
6. Please describe the process you had to undertake to receive approval for your FSP from the Ministry of Forests.
7. Please describe your understanding of government expectations for a rationale to support the approval of alternative forest practices. Specifically, what sort of information is required to demonstrate to the SDM that an alternative practice is consistent with the objectives under FRPA?
8. Does your company have procedures for monitoring the implementation and effectiveness of alternative forest practices? Are there procedures for public reporting?
9. In closing, do you think there are opportunities to alter FRPA to allow for increased opportunity for innovation? If so, how?

B. Interview Questions for Statutory Decision-Makers

1. How would you define an innovative forest practice?
2. How important do you think innovation is to long-term forest sustainability?
3. To what extent do you think the FRPA framework provides opportunity for the development of innovative forest practices?
4. To what extent do you think increased professional reliance and independence under FRPA will foster innovative forest practices?
5. What types of forest practices do you believe offer the greatest possibility for innovation? The least possibility?
6. To what extent do you believe licensees are researching and evaluating alternative forest practices?
7. Can you provide any examples of innovative forest practices that have been proposed in FSP's that you have approved? Or that you have seen implemented in your district?
8. To what extent do you think FRPA has provided the driver for innovative forest practices? Are there other drivers?
9. Please describe the process for licensees to submit and receive approval for their FSP's, and the level of discussion between licensee and government foresters.
10. Please describe government expectations for a rationale to support the approval of alternative forest practices. Specifically, what sort of information is required to demonstrate that an alternative practice is consistent with the objectives under FRPA?
11. In Phase 1 survey responses, several foresters have indicated that one of the most important reasons they have chosen default forest practices is due to a concern that alternative practices will not be approved by the SDM. To what extent do you believe SDM's may discourage licensees from developing alternative practices for approval in their FSP and why?
12. Where licensees are committing to alternative forest practices, what sort of procedures are there within government to:
a. Monitor the implementation of alternative practices, and
b. Assess the effectiveness of alternative practices?
13. In closing, do you think there are opportunities to alter FRPA to allow for increased opportunity for innovation? If so, how?

Note: for each interview – I may draw upon specific examples from the FSP that is the subject of discussion to provide greater context for my question.