Forest Policy and Economics 62 (2016) 2–10

Contents lists available at ScienceDirect

Forest Policy and Economics

journal homepage: www.elsevier.com/locate/forpol

Barriers to innovation in response to regulatory reform: Performance-based forest practices regulation in British Columbia

George Hoberg *, Leah Malkinson, Laura Kozak

Department of Forest Resources Management, University of British Columbia, Canada

ARTICLE INFO

Article history:
Received 15 September 2013
Received in revised form 19 August 2015
Accepted 28 October 2015
Available online 10 November 2015

ABSTRACT

Regulatory reformers have shown increased interest in performance-based regulation that focuses on the objectives being pursued rather than the means or process by which they are achieved. This article examines a revealing case of behavioral response to regulatory reform: the response of regulated entities to a new, more performance-based form of environmental regulation of forest operation in British Columbia, Canada. We examine the implementation of the new system of forest regulation by analyzing the operational plans produced through the first round of the new framework's implementation. We expected to see innovation in the Forest Stewardship Plans proposed by forest companies. However, forest companies' concerns for costs, risk and liability, and values and perceptions of forest management limited the extent of innovation.

1. Overview

Frustrated with the cost and complexities of direct regulation, regulatory reform initiatives have identified a number of alternatives, ranging from voluntary approaches to market-based regulations such as tradable permits (Gunninghan, 2009). One noteworthy alternative is performance-based regulation that focuses on the objectives being pursued rather than the means or process by which they are achieved. The advantage of performance-based regulation is that it promises to provide a more cost-effective approach to achieving desired objectives by providing regulated entities the flexibility to find the least costly means of achieving the required performance standard (May, 2003, 2007; Coglianese and Lazer, 2003).

While performance-based regulation is increasingly popular with governments and advocates of regulatory reform, there is very little research on the behavioral response of regulated entities to the provision of greater flexibility in performance-based regulation. This article examines a revealing case of behavioral response to regulatory reform: the environmental regulation of forest companies in British Columbia, Canada. British Columbia is renowned for the spectacular environmental values associated with its vast forests, including increasingly rare areas of intact primary forest (e.g., Cashore et al., 2001; Pralle, 2006). Its economy is also very dependent on the forest industry for employment, government revenues, and export earnings. Not surprisingly, there has been considerable conflict over the province's policies for regulating forestry. After the implementation of a prescriptive, process-oriented "Forest practices Code" in the 1990s proved to be unduly complex and economically costly, the province introduced what it called a "results-based code" in the early 2000s.

The new regulatory framework was brought in through the Forest and Range Practices Act (2004). The government's objectives in introducing the new law were described in accompanying documents:

- 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 Ministry of Forests, 2004).

While the new system was designed to be a more performance-based system of regulation, it was a somewhat unusual variant on that theme. The hallmark of performance-based regulation is the specification of measurable objectives in performance standards, and the provision of flexibility to operators to develop practices to meet the objectives. The designers of the new British Columbia framework did not, for the most part, develop measurable government objectives, but instead articulated general, qualitative objectives in regulations. For example, the objective for 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." Forest companies are responsible for developing operating plans, called Forest Stewardship Plans (FSPs), which provide measurable "results and strategies"

* Corresponding author.

http://dx.doi.org/10.1016/j.forpol.2015.10.014
1389-9341/

to meet the broad government objectives. The plans are then reviewed and approved by government, with a system of compliance and enforcement in place. As a result, the new framework also shares some of the features of management-based regulation described by Coglianese and Lazer (2003).

If forest companies do not want to propose their own results and strategies, the regulatory framework provides so-called "default practices" that companies may follow for many of the environmental values in the regulatory scheme. These default practices are essentially the same as the prescriptive regulatory standards in the previous "code" regime that were maligned as unduly costly and restrictive by the forest industry and professional foresters (Cashore et al., 2001, Chapter 3). Keeping with the riparian example, the default practices consist of a table, essentially copied from the previous regulatory framework, that specifies mandatory buffer zones of different widths depending on the size of the stream and the presence or absence of fish. For example, for a fish-bearing stream between 1.5 and 5 m across, forest companies are required to leave a buffer strip of 20 m on each side. The hallmark of the new system is the provision of flexibility to the regulated industry to generate their own alternative practices to meet the regulation's environmental objectives (Hoberg and Malkinson, 2013).

This article examines the implementation of this new, more flexible system of forest regulation by analyzing the operational plans produced through the first two round of the new framework's implementation. Given the persistent demands by the forest industry and professional foresters in the province to be unleashed from the prescriptive shackles of the previous Forest Practices Code, we expected to see innovation in the Forest Stewardship Plans proposed by forest companies. In other words, the new plans would contain a significant amount of alternatives to pre- existing practices. However, new provisions for flexibility are not likely to be sufficient cause to influence all operators to develop alternative forest practices. Forest companies will also consider costs, third-party certification commitments, risk and liability, and values and perceptions of forest management will also influence a forest company response to the new system.

In particular, we examined the following hypotheses in explaining the extent of innovative behavior by forest companies:

1. foresters who perceive the default practices as being effective are less likely to develop alternative practices;
2. foresters who perceive the default practices as being economically efficient are less likely to develop alternative practices;
3. foresters with access to greater financial resources are more likely to develop alternative practices;
4. foresters who perceive that the cost of developing alternative forest practices for approval is high are less likely to develop alternative forest practices;
5. foresters who perceive a high level of legal risk associated with the development of alternative practices, are less likely to develop alternative forest practices;
6. forest companies who have committed to third-party certification (e.g. Forest Stewardship Council or Canadian Standards Association) are more likely to develop alternative forest practices to meet certification commitments.

2. Methodology

Forest Stewardship Plans (FSPs) can provide an initial indication of the possibility for innovation, and licensees' potential willingness to test innovative approaches. If forest companies opt to undertake the default practices wherever these are provided, 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 FSPs approved by government as of March 15, 2007 was undertaken. A total of roughly 200 FSPs were submitted for approval over the following months. These 65 FSPs provided a sufficient cross-sectional sample of FSPs to support the extrapolation of research results to the broader population of FSPs, while still being a feasible size to allow for the direct review of all plans. All 65 FSPs were reviewed for the purpose of assessing forest company response to the FRPA framework and to identify indications of the potential for innovative forest practices with respect to the management of three core environmental values - soils, biodiversity, and riparian areas. For each of these values, the forest practice commitments made by forest companies in the form of 'results and strategies' were reviewed and documented.

A web-based survey was then sent to the prescribing foresters who developed and are accountable for each of the 65 FSPs, for the purpose of eliciting an understanding of the rationale behind their choice of practices and their willingness to innovate. Four FSPs were subsequently selected as case studies for more in-depth exploration, and phone interviews were undertaken with both the prescribing forester who prepared the plan and the statutory decision-maker who approved the plan. The four case studies were selected to reflect a diversity of company sizes, geographical locations, and commitments to voluntary certification initiatives.

To determine if there had been an increase in innovation since the first round of plan submission and approval, we reevaluated a subset of the 65 FSPs in 2015, with the same methods used for the first round. From the original list of 65 FSP, 16 were left to expire without resubmission. We examined the remaining 49 plans. The majority of the plan resubmissions were a sequence of amendments as opposed to newly developed plans, so we reviewed each tenure license for its plans amendments between the cut-off date for the original study (March 2007) and their respective dates of FSP extension approval.

3. Limited innovation in Forest Practices

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 forest companies 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 the first 65 Forest Stewardship Plans 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. As shown in Fig. 1, 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 the plans. On average, 78% of forest practice commitments across all 65 plans 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. For the alternative forest practices that were specified in the plans, 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). Alternative practices that were identified in Forest Stewardship Plans are better characterized as revisions to default practices that provide greater flexibility in application at a site level rather than new or innovative practices.

Data collected in the second round to observe changes in commitments over time show only marginal changes, an overall decrease in default practices by 4%, 2% of which is attributable to an increase in commitments to recently implemented compulsory objectives from land

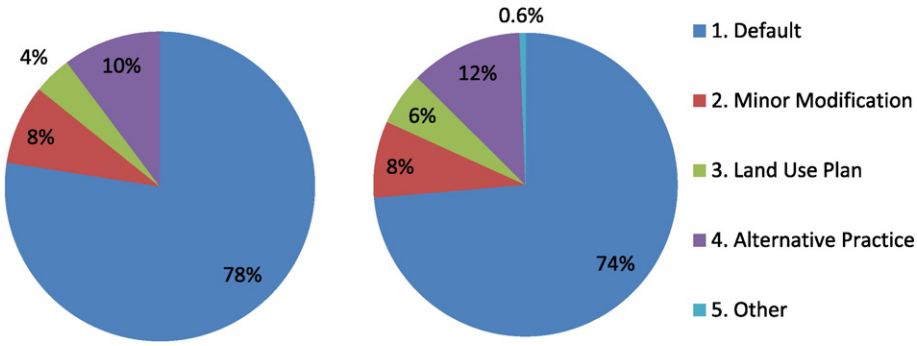

Fig. 1. Distribution of practice commitments for 2011 and 2015 results.

use plans (Fig. 1). The remaining 2% reflect an increase in alternative practices. The 0.6% falling under "other" was accounted for in the original study with no change in frequency, but was not displayed in the original graph. This category encompasses the claim that section 53 is irrelevant to the area — "there are no temperature sensitive streams within the tenure boundary."

Only 16 of the 49 studied FSPs had made changes to the observed values since the original study. 8 of these changes were mandatory due to the implementation of ministerial orders for land use plans and 1 was a recourse to default practices.

4. Factors influencing licensee willingness to innovate

Why are there few indications of alternative and innovative practices in these early plans? 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. The survey was conducted following the initial data review in 2011.

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 (Fig. 2). 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 (Fig. 3).

Each of these factors will be explored in the sections that follow, along with a discussion of forest company perceptions of innovation and other perceptions and context that may be influencing the willingness of operators to implement innovative forest practices under British Columbia's Forest Range and Practices Act.

4.1. 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 (Fig. 4).

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*".

4.2. Perceptions of forest management and the effectiveness of default standards

The number one reason prescribing foresters chose to commit to the pre-existing default forest practices was effectiveness — reflecting a belief that the default standards provided by FRPA are reasonably

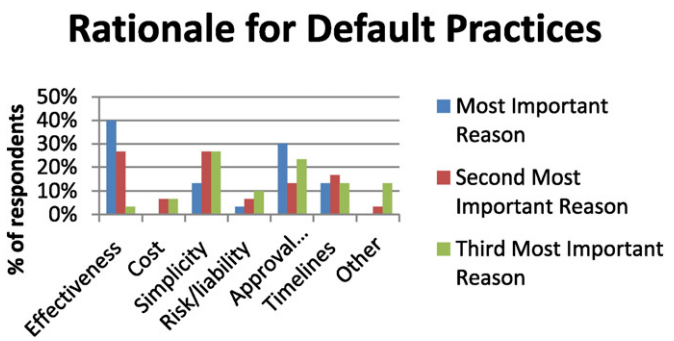

Fig. 2. Rational for choosing default practices.

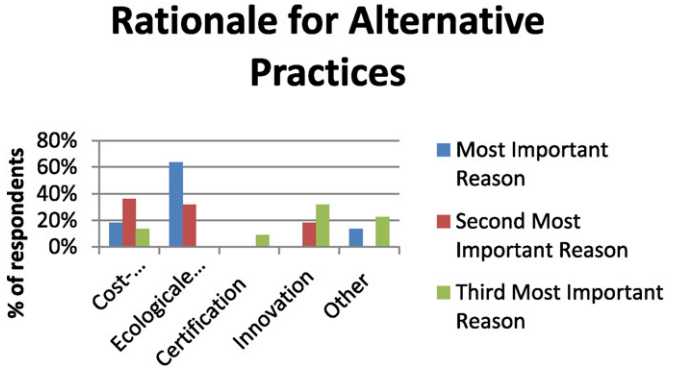

Fig. 3. Rational for choosing alternative practices.

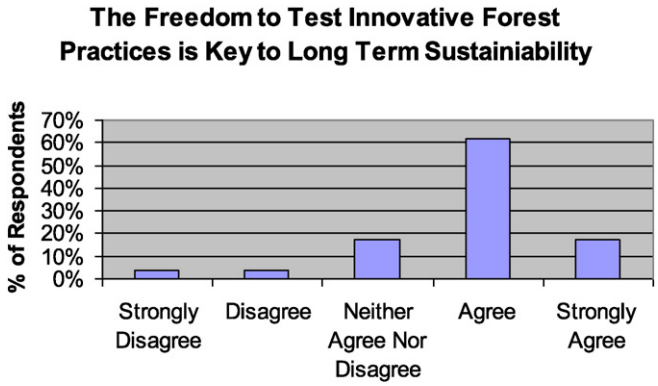

Fig. 4. Perceptions of the importance of innovation.

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 previous regulatory framework (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 1 below). However, they also believe that the Forest Practices Code was less effective in maintaining economic values, a situation they suggest has been improved under the new regulatory framework.

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.

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.

4.3. Certainty of operating plan approval

The second most common reason prescribing foresters chose default standards was certainty of Forest Stewardship Plan approval. Simplicity and timelines were also commonly identified, both of which were ultimately related to the need for certainty of plan approval within the stated deadline. Several respondents alluded to a perceived difficulty in attaining approval from government for their Forest Stewardship Plans if alternative practices were proposed. Given the timelines in which they had to prepare their plans, several respondents suggested that they focused on the simplest path to approval for their first Forest Stewardship Plan 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 DMs have approved our alternatives while other DMs are currently implying they will not approve them*".

Table 1
Perceptions of the effectiveness of forest practices under the code.

Forest-related value	% responses by category						
	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**
Archeology/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**

Numbers in bold represent average response.

"*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 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 RPFs 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 British Columbia's new regulatory framework. When FRPA was introduced, the government emphasized that it expected that resource professionals would have more discretion and accountability in the new regulatory framework, and that those responsible for plan approval would extend a greater level of trust to the prescribing foresters employed by licensees. However, surveys revealed continued tensions between government and industry professionals. The Professional Reliance Survey conducted in the fall of 2010 (BC MoFR, 2010) 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, 2010).

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*".

This 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 performance-based regulatory framework BC policy-makers were trying to design, and the forest management context more broadly. For several values, the Forest and Range Practices Act 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 behaviors 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 Forest and Range Practices Act 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 (Richardson and

Thompson, 2009). 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, forest companies are compelled to develop a strategy for effectiveness monitoring - a potentially expensive venture.

In summary then, it appears to be the fundamental lack of knowledge and measurable desired outcomes that are ultimately resulting in perceived challenges with the approval of alternative forest practices. In the absence of this knowledge, forest companies 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.

4.4. Economic and cost considerations

While only a few respondents specifically selected cost as a reason for committing to default 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 Forest and Range Practices Act 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. A review of which companies pursued the most alternative forest products reveals this is not necessarily the case, however. No company had more than 7 alternative practices. Of the two that had 7, one was a major forest products company, the other was a very small company. Of the 11 plans that had more than 3 alternative practices, 4 were held by large licensees, four were held by very small licensees, and four were held by the BC government's timber sales program.

4.5. Perceptions of risk and liability

Survey respondents indicated a perception that professional liability has significantly increased and corporate liability has moderately increased under the performance-based BC 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.

4.6. The influence of certification

While it is beyond the scope of this article to fully evaluate the influence of third party 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%).[1] One interviewee (who was not a survey respondent) was certified by the more environmentally rigorous Forest Stewardship Council. 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

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

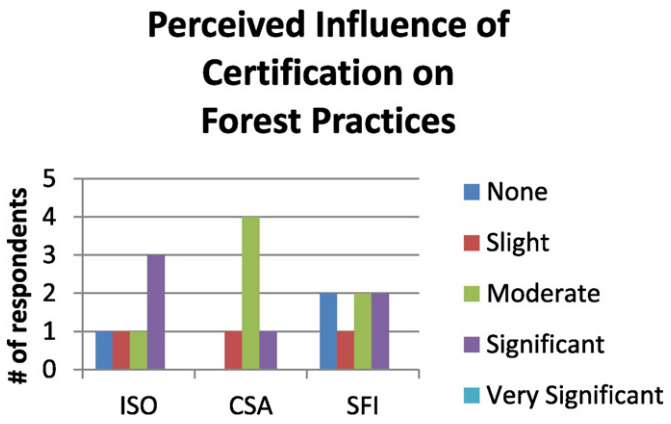

Fig. 5. The perceived influence of certification on forest practices.

from none to significant (Fig. 5), and an average response of 'moderate' for all three types of certification.

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.

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.[2]

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) 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.

4.7. Perceptions of statutory goal achievement

Prescribing foresters were asked to provide their perceptions of the degree of change that had occurred since the implementation of the Forest and Range Practices Act 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 2).

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

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 government personnel. They also suggested that government approvers are very risk adverse and not willing to approve innovative practices proposals in Forest Stewardship Plans. 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. An updated report from the Board states "the existing culture associated with FSP preparation and approval is unacceptable" (BC Forest Practices Board, 2015).

5. Discussion

Given how important the desire for innovative, alternative practices were in the push for regulatory reform in British Columbia forestry in the early 2000s, one might be surprised that the first round of operating plans approved show so little innovation in forest practices. 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 second round saw only a very marginal increase of 2% in innovation. A BC Forest Practices Board report, using a different sample and approach, found similar results. Of the 43 plans they reviewed, only 4 had an indication of innovative practices in any of their elements. The report concluded, simply, "Innovation in FSPs is rare."

[2] This participant further suggested that FSPs 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.

Table 2
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

Numbers in bold represent average response.

Our survey and interviews after the first round reveal that prescribing foresters believe that innovation is key to long-term forest sustainability and that the Forest and Range Practices 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. Some expected to see an increase in innovation in subsequent rounds, but our analysis of the second rounds of plan approvals suggest that is not yet the case. There is a fairly strong convergence in opinion about the reasons for the lack of innovation in the first round of plans implemented under the new system.

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. Their continued use in the second rounds indicates this degree of satisfaction has continued. 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 operating plans. (A report by the BC Forest Practices Board (2015) support this conclusion.) They suggest that 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 previous, more prescriptive regime) are based partly on 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.

It is important however, to acknowledge several limitations on 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. In practice however, it can be difficult to apply this definition and identify the degree of innovation in a proposed practice. In fact, many of the alternative forest practices that were identified are probably 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 higher, 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. 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 operating plans are a good indication of the practices that will ultimately be implemented on the ground. This assumption is actually somewhat questionable. Forest Stewardship Plans are the single legally enforceable planning document under the regulatory regime, and forest companies 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 forest companies as reflecting minimum practices that are legally required under Forest and Range Practices Act. If forest companies elect to implement practices that are incremental to legal 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 Forest Stewardship Plans reflect practices on the ground. However, none of the other case study participants nor any of the survey respondents identified a concern with using the practices identified in the Forest Stewardship Plan for the purpose of this research, suggesting it is reasonable to assume the practices identified in a plan provide a good indication of the practices that will be implemented in the field.

6. Conclusion

This article has shown that the response of the regulated industry to opportunities for innovation provided through regulatory reform in

forest practices regulation was relatively limited — in the first round of plan approvals, only 10% of practices adopted under the new system can reasonably be classified as "alternatives" to the default prescriptive standards provided by regulators, and that only increased by 2% in the second round. The survey results provide some explanation for this limited innovative response. First, a majority of foresters believe that the prescriptive 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 operating plan approval', 'simplicity', and 'timelines' were identified as the second, third and fourth most important reasons respectively for the choice of default practices. These factors suggested that more innovation would occur in subsequent rounds, but our analysis shows that it is not the case. Challenging economic circumstances in the forest sector have, according to some respondents, resulted in staff cutbacks that have left little time and resources to invest in innovative planning. While the first round of plans, completed in 2007, was near the nadir of the economic cycle, robust profitability continues to elude the forest sector in British Columbia. BC forest sector sales in 2007 were 24% below their 2004 levels. They bottom out in 2009 at 50% below 2004 levels, and by 2013 had only recovered to 32% below 2004 levels by 2013 (BC Ministry of Forest, Lands, and Natural Resource Operations, 2014).

While only a few respondents specifically identified cost as one of 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, but our analysis suggests there is little relation between company size and opting for alternative forest practices. Perceptions of increased cost associated with the development of alternative practices were therefore confirmed in this research as influencing forest companies' willingness to innovate. In contrast, perceptions of increased risk and liability were not confirmed as influencing willingness to innovate. Foresters agreed that they have increased accountability under the new regime but did not confirm that this had a significant influence on their choice of forest practices.

The absence of meaningful increase in alternative approaches in the second round of plan approvals suggest the results are not a mere artifact of an early rush to get plans approved. The degree to which alternative approaches are proposed and approved in the future will likely continue to be significantly influenced by two key interrelated variables:

a) the approach and expectations of government decision-makers with respect to acceptable documentation and risk evaluation to support alternative practices, and;
b) the degree to which forest companies are willing to invest in research and monitoring of the implementation and effectiveness of alternative approaches.

It is entirely possible that the cost of research and monitoring could outweigh the perceived benefits of alternative approaches, influencing forest companies to either accept default and known practices or to pressure government to simply trust that industry will adequately manage risk to values. The government is clearly committed to supporting professional reliance and enabling innovation in forest practices where possible and government forest officials will be motivated to uphold this objective of government in their decision-making. However, the ultimate success of British Columbia's more performance-based regime is also very much reliant upon public support and confidence. 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 today, that the new regulatory framework is effectively about 'deregulation' of forest practices. This enduring tension will remain as a powerful influence on decision-making about future forest practices.

The response of the regulated industry to opportunities for innovation through more flexible regulation has revealed what at first seems to be a surprising lack of response. Upon consideration of the factors that motivate responses by regulated firms, however, challenging tradeoffs become more apparent. In this case, regulators did not specify measurable performance standards for most of the environmental values at stake, and essentially invited the regulated industry to take the initiative to do so. In a domain of high uncertainty and political sensitivity, it would be costly for firms to undertake the preparation and follow-through to develop standards that would be acceptable to government. As a result, most firms opted to simply stick with the prescriptive default rules of the previous regimes.

References

Association of BC Forest Professionals, 2009. 2009 ABCFP Public Opinion Poll Results [Last accessed 5 March 2011.] Available from URL: http://www.abcfp.ca/publications_forms/publications/documents/2009_results_report_final.pdf.

BC Ministry of Forests, 2004. Forest stewardship plans produce enforceable results Accessed 2 November 2015 from: http://www.for.gov.bc.ca/code/backgrounders/forstew.pdf.

BC Forest Practices Board, 2006. A Review of the Early Forest Stewardship Plans Under FRPA: Special Report 28 [Last accessed 15 December 2010.] Available from URL: http://www.fpb.gov.bc.ca/publications.aspx?id=2712.

BC Forest Practices Board, 2015. Forest Stewardship Plans: Are They Meeting Expectations? FPB/SIR/44, August. https://www.bcfpb.ca/sites/default/files/reports/SIR44-FSP-Are-They-Meeting-Expectations_0.pdf.

BC Ministry of Forest, Lands, and Natural Resource Operations, 2014,. 2013 Economic State of the BC Forest Sector August 2014. Available at https://www.for.gov.bc.ca/ftp/het/external/!publish/web/economic-state/Economic-State-of-BC-Forest-Sector-2013.pdf.

BC Ministry of Forests and Range, 2009. Administrative Guide for Forest Stewardship Plans: Volume 1: Preparation and Approval of an FSP Version 2.1. [Last accessed 30 August 2010.] Available from URL: http://www.for.gov.bc.ca/hth/timten/AGFSP/index.htm.

BC Ministry of Forests and Range, 2010. Professional reliance survey 2010: written comments [Last accessed 22 March.] Available from URL: http://www.for.gov.bc.ca/ftp/hth/external/!publish/Web/frpa-admin/frpa-implementation/workshops/professional-reliance/PR%20Survey%20Comments%20Sept%2027%202010.pdf.

Cashore, B., et al., 2001. In Search of Sustainability: British Columbia Forest Policy in the 1990s. UBC Press, Vancouver.

Coglianese, C., Lazer, D., 2003. Management-based regulation: prescribing private management to achieve public goals. Law Soc. Rev. 37 (4), 691–730.

Government of British Columbia, 2004. FRPA training companion guide: forestry modules.

Gunningham, N., 2009. Environment law, regulation and governance: shifting architectures. J. Environ. Law 21 (2), 179–212.

Hoberg, G., Malkinson, L., 2013. Challenges in the design of performance-based forestry regulations: lessons from British Columbia. Forest Policy Econ. 26, 54–62.

May, P.J., 2003. Performance-based regulation and regulatory regimes: the saga of leaky buildings. Law Policy 25 (4), 381–401.

May, P.J., 2007. Regulatory regimes and accountability. Regul. Gov. 1, 8–26.

Pralle, S., 2006. Branching Out, Digging In: Environmental Advocacy and Agenda-Setting. Georgetown University Press, Washington, DC.

Richardson, J.S., Thompson, R.M., 2009. Setting conservation targets for freshwater ecosystems in forested catchments. In: Villard, M.-A., Jonsson, B.-G. (Eds.), Setting Conservation Targets for Managed Forest Landscapes. Cambridge University Press, Cambridge, pp. 244–263.

Stanbury, W.T., Vertinsky, I.B., 1998. Governing instruments for forest policy in British Columbia: a positive and normative analysis. In: Tollefson, C. (Ed.), The Wealth of Forests: Markets, Regulation and Sustainable Forestry. UBC Press, Vancouver, pp. 42–77.

Tikina, A., 2006. Assessing the effectiveness of forest certification in the Pacific Northwest and British Columbia, Canada PhD Thesis University of British Columbia, Vancouver.

Laws cited

Forest and Range Practices Act, British Columbia (2002)

Forest and Range Practices Act Forest Planning and Practices Regulation (includes amendments up to BC Regulation 4/2010), British Columbia (Regulation no. 14/2004)

Forest Practices Code of British Columbia Act, British Columbia (1996)