EVALUATING BC'S COMMUNITY FOREST AGREEMENT PROGRAM AS A TOOL FOR SOURCE WATER PROTECTION

by

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ABSTRACT

The government of British Columbia introduced the Community Forest Agreement program (CFAP) in 1998. The program offers opportunities for communities to gain a degree of control over their surrounding forests through a form of timber tenure. Some communities have acquired a Community Forest Agreement with the intention of using it to protect the watersheds that provide their drinking water. This study evaluates the opportunities provided by the CFAP for source water protection and seeks to understand what changes communities and government could make to improve these opportunities. The experiences of the Harrop-Procter, McBride, and Creston community forests are used as case studies. The study concludes that community forests have been successful at protecting their source watersheds over the short term through the CFAP. It also recommends changes to forest planning approaches, governance arrangements, business structures, and tenure arrangements that could help improve long-term opportunities for community-based source water protection.

Keywords: Community Forest Agreement; source water protection; community forestry; community based natural resource management; drinking water; watershed management

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

AAC	Allowable annual cut
BC	British Columbia
CCF	Creston Community Forest
CFA	Community Forest Agreement
CBNRM	Community-based natural resource management
CVFC	Creston Valley Forest Corporation
FPB	Forest Practices Board
FRPA	*Forest and Range Practices Act* (S.B.C. 2002, c. 69)
FSC	Forest Stewardship Council
HPCC	Harrop-Procter Community Cooperative
HPCF	Harrop-Procter Community Forest
HPWPS	Harrop-Procter Watershed Protection Society
IRM	Integrated resource management
KCF	Kaslo Community Forest
LXCF	Likely-Xat'sull Community Forest
MCF	McBride Community Forest
MCFC	McBride Community Forest Corporation
MOF	British Columbia Ministry of Forests (the provincial ministry responsible for forestry regulation up until 2004)
MOFR	British Columbia Ministry of Forests and Range (the provincial ministry responsible for forestry regulation since 2004)
SOP	Standard Operating Procedure

1: INTRODUCTION

British Columbia is a province simultaneously blessed and cursed by expansive forests. Many of the province's cities, towns, and villages have been built upon the revenues generated from forestry; however, few communities, or ecosystems, remain untouched by the social, environmental, or economic impacts of logging. The forest industry is deeply ingrained in the culture and politics of BC, and it remains one of the most studied and debated topics amongst this province's political and academic associations.

Some of the problems traditionally associated with the industrial forestry model, including poor environmental management and boom and bust economic cycles, have produced long-standing conflicts between logging companies, governments, and resource-dependent communities (Hayter, 2003; McIlveen & Bradshaw, 2005). Export-dependence has made the forest economy and forest-dependent communities vulnerable to market fluctuations, and many argue that BC's forest resources have been overharvested and are nearing exhaustion (McIlveen & Bradshaw, 2005). Accordingly, since the mid- twentieth century, several reforms in BC's forest policy have taken place (Ambus, Davis-Case & Tyler, 2007). The concept of community-based forest management, especially, has been gaining support amongst the citizens of British Columbia, culminating in the emergence of the provincial government's Community Forest Pilot Project in 1998.

One of the potential core benefits of community forestry is the opportunity for an area's residents to determine for themselves what forest resources are valued over others (Anderson & Horter, 2002). Some BC communities see the forest in a similar manner to most logging corporations—as a source of revenue (McIlveen & Bradshaw, 2005). Others see the forest as a source of employment for local residents, while still others, particularly BC's First Nations communities, see the forest as a place where traditional activities and cultural connection can take place (British Columbia Community Forest Association, 2009a).

For much of BC, the forest is also a source of drinking water—a forest value that is of primary importance to many BC residents and water-dependent industries. Creeks and rivers that supply municipal or domestic water intakes often run through land that is part of the provincial timber harvesting land base. The quality, quantity, and timing of flow of water from both surface and ground sources are sensitive to the types of disturbances that timber harvesting, road building, and fires, can cause (Herbert, 2007). Hence, logging in source watersheds—watersheds that provide drinking water to individuals or communities—has traditionally provoked much tension between BC's forest sector and the communities in which it operates. Such conflict, and the demands of community members for safe and secure water supplies, has fuelled the growing movement towards increased levels of source water protection across much of Canada.

Source water protection refers to land management efforts that maintain water quality, quantity, and timing of flow in a manner that prevents or minimizes

threats to the safety of water for human consumption (Ively, de Loe, Kreutzwiser & Ferreyra, 2006). The concept is recognized as “almost invariably the best method of ensuring safe drinking water and is to be preferred to treating a contaminated water supply to render it suitable for consumption” (WHO, 1993, 8).

Source water protection in logged areas requires a commitment to forest practices that, in some ways, deviate from traditional industrial approaches (Lynch, Corbett & Mussallem, 1984). The condition of source water, unlike that of other forest resources, such as timber or botanical products, directly affects human health, and the consequences of water quality or quantity problems are experienced acutely. For these reasons, logging in source watersheds must be done carefully, with due consideration for the consequences of failure. Logging that protects source water quality is thus costly and time consuming, and it can be difficult to implement for large corporations with the mandate or motivation to maximize profits.

Not surprisingly, provincial and local governments alike have viewed community forests as a potential route through which to mitigate water-related conflict on crown land. It only makes sense that community members might feel more comfortable having their watershed logged by a local organization that is accountable to the community for its operations, rather than a large, anonymous corporation with little direct stake in local environmental conditions. Accordingly, some areas have begun to test the feasibility of source water protection through community forestry, and these areas are the focus of this study.

Titlebaum, Beckley, and Nadeau (2006) define community forests as any forest organization that is run by the community, for the benefit of the community. Davis (2008) further interprets a community forest as:

> a new kind of forest, wherein not only scientific management goals are central. The direction of economic output of the forest and the social impacts on the people in the region should also be a consideration. It is an organization of people, not merely a logging operation or a place on a map. (p. 14)

Although the specifics of forest management vary widely, in British Columbia, community forests, at least as they exist under the Community Forest Agreement Program (CFAP), support timber harvests. The CFAP, introduced as a successor to the Community Forest Pilot Project in 2003, now includes 39 community forests, which collectively manage over a million hectares of land. The objectives of the program are unique in that they advocate the adoption of forest management systems that incorporate local values and that diversify the benefits derived from the timber harvesting land base.

Thus, the BC Community Forest Agreement—the legal document that defines the relationship between a forest's managing entity and the crown—is more than just another provincial timber tenure. It is a unique opportunity for communities, in that it represents a transfer of rights over a defined land base from the province to a local organization. As such, a community is given a certain degree of control over how their nearby resources are managed, and, within certain constraints imposed by the province, it can establish what portions of the forest are dedicated to logging, environmental protection, recreation, or other uses.

Community forestry, at a wide scale, is new to British Columbia. Small, locally based organizations with limited capacity, capital, and experience characterize the movement (Ambus, 2008). Adaptive, learning-oriented strategies are therefore a central component of most community forests' operations. There is a growing body of literature originating from academia, governments, and the community forests themselves that attempts to share lessons learned by some communities for the benefit of others (see: Anderson and Horter, 2002; McIlveen and Bradshaw, 2005; Meyers Norris Penny LLP & Enfor Consultants, 2006; and others). For the most part, these lessons concern issues related to forest practices, tenure, governance arrangements, or market access. No study has specifically focused on the issues that community forests in BC face when attempting to manage drinking watersheds. The present study addresses that gap in the literature.

This research is part of an overarching project that addresses the general question of how community forests can act as a new model for forest management in BC. The wider project involves co-investigators from two universities and has been developed with input from representatives of the community forests that hosted our study. My specific research seeks to answer two questions. First, how and to what extent does the Community Forest Agreement Program offer opportunities for source water protection in British Columbia? Second, what changes could community forests or governments make in order to improve source water protection under the Community Forest Agreement Program? The associated objectives are threefold:

1. evaluate how successful current initiatives have been at protecting source water through Community Forest Agreements;
2. examine what aspects of the legal, institutional, social, economic, and ecological context of community forests either enable or hinder effective source water management; and,
3. identify what changes could be made in order to improve the potential for source water protection in community forests.

I attempted to fulfil this study's objectives by compiling primary and secondary data from a diverse array of sources. I, in collaboration with an interdisciplinary research team, completed over 75 interviews with stakeholders engaged with five community forests for which source water management made up at least a portion of their mandate. I used the experiences of three of these forests as case studies, and drew on results from two others for additional information. I used secondary data, in the form of management plans, monitoring reports, and other relevant sources of information, to corroborate findings from interviews and compare the experiences of case study forests with those at wider geographical scales. I chose to frame this study as an evaluation and I based its findings on the extent to which each case study forest achieved a set of objectives related to source water management in community forests.

This report begins by reviewing the literature on community forestry and source water management in BC in order to set the context for the discussion that follows. A methodology section describes the study and the specific procedures that were employed while collecting and analysing information. I then present the results from each community forest case study individually. Finally, I

discuss common themes from the results, and offer recommendations for how to adapt management structures of community forests and governments in order to improve the potential for source water protection under the Community Forest Agreement Program.

2: HISTORY OF COMMUNITY FORESTS IN BC

Considerable changes have marked the last thirty years in British Columbia's logging sector (Ambus et al., 2007). Notably, a shift has occurred in the parties that hold influence over the policies and regulations that guide forest management. Prior to the 1970s, the provincial government and major tenure holders almost exclusively determined forest management practices, but in recent years some control over logged lands has devolved and is now shared by a wider range of stakeholders (Ambus et al., 2007). This shift is evident in the emergence of an alternative mode of forest management in lands controlled by communities (Pinkerton, Heaslip, Silver & Furman, 2008). Community forestry enjoys a prominence in British Columbia that is unparalleled in other regions of Canada (Teitlebaum et al., 2006). This section explores the historic circumstances that have led to the present-day status of community forestry in the province, and examines how this approach has translated from a global movement to a series of localized initiatives.

For much of the twentieth century, the concept of 'sustained yield' drove forest policy in BC. Sustained yield is an approach designed to provide a constant supply of timber over the long term by systematically replacing old growth forests with even aged stands more suited to rapid timber production (Ambus et al., 2007). In North America, advocates of sustained yield practices marketed this approach as the saviour of both timber stock levels and the stable

employment opportunities that accompany predictable harvests (Bridge & McManus, 2000). In the 1970s and 1980s, however, the rise of environmentalism, both in Canada and abroad, forced a shift in the ideals that shape forest policy. As Lertzman, Rayner and Wilson (1996) argue, during this period environmentalists successfully demonstrated that the sustained yield paradigm failed to address important issues including the inequities of top-down, centralized forest management, and the lack of consideration for values, apart from timber, that stem from healthy forest ecosystems. Moreover, provincially-directed management based on sustained yield principles often did not accomplish even those things that it set out to do—namely stabilize the forest economy or assure the continuous availability of timber (Lertzman et al, 1996; McIlveen & Bradshaw, 2005). Sustained yield policy in BC had little impact on the volatility of the international commodity markets that characterize the increasingly globalized economy (McIlveen & Bradshaw, 2005), and the looming threat of the 'falldown[1]' hovered over the long-term productivity of BC's forests (Lertzman et al.,1996).

As knowledge of these shortcomings spread throughout the province, incidents such as the highly publicized logging-related protests at Clayoquot Sound and Lyell Island became more commonplace (Alper, 1997). Tensions between the citizens of British Columbia, the provincial government, and prominent corporations coalesced in the outbreak of the 'War in the Woods'—a decades-long dispute marked by citizen blockades, international boycotts on BC

[1] The 'falldown' is a term used to describe the eventual decline in biomass available for harvest when "original timber stocks", or old growth forests, are replaced by second growth stands (MOFR, 2008a).

timber and other forest products, and fierce calls for reform in the policies that governed the forest sector (Berstein & Cashore, 2000; Hayter, 2003).

In 1991, amidst the conflict and demands for change, the New Democratic Party was elected to power in BC. Almost immediately, the new government embarked on a series of attempts to provide local stakeholders in British Columbia a more direct role in the processes that planned the management of provincial land (Wilson, 2000). Notably, the Commission on Resources and Environment (CORE), launched in 1992, facilitated a series of strategic land use planning processes that developed, amongst a diverse array of stakeholders, collaborative visions for crown land management (Brown, 1996).

At about the same time, the government relaxed its stance on the historic policy of appurtenancy, which required that timber licensees build and operate a processing facility in the region where their harvest was based (Haley & Nelson, 2006). The appurtenancy policy, which the Ministry of Forests abolished altogether in 2003, had been highly criticized as it encouraged vertical integration of the industry, and the amount of capital required to develop a processing facility limited the diversity of companies that were able to enter into the provincial forest sector (Haley & Nelson, 2006). With the end of appurtenancy, however, came a reduction in the level of accountability between a forest company and the population of its operating area.

By the mid-1990s, BC's forest sector was in a state of crisis and the provincial government began to look at community forestry as an option with the potential to reconcile some of the pervasive friction between the Ministry of

Forests and the residents of British Columbia (McCarthy, 2006; Pinkerton et al., 2008). Proponents of community forestry argued that the concept had the potential to solve many of the problems faced by the logging industry—it could improve public relations, stabilize rural economies, and provide a host of other benefits to small communities (Ambus, 2008).

BC's movement towards citizen-led forestry did not occur in isolation. Global support for community-based natural resource management (CBNRM) has grown rapidly over the past several decades, partially in response to the failures of many traditional state-led resource management schemes (Armitage, 2005). Such conventional approaches have been linked to boom-and-bust economic cycles, resource collapse, and conflict between resource users (Bradshaw, 2003; Davis, 2008). As an alternative, CBNRM transfers some decision-making power from centralized governments to local communities and can be used as a strategy to empower impoverished populations and promote rural economic development. Involvement of local stakeholders in resource management decisions is now also recognized as potentially one of the most effective paths to sustainable resource use (Sekher, 2001; Taylor & Zabin, 2000).

Theoretical rationales for engaging in CBNRM have been widely publicized. First, by transferring decision-making power to the people who will directly benefit, or suffer, from the long term condition of a natural resource, it is assumed that management decisions are likely to incorporate considerations of sustainability (Bradshaw, 2003). Second, CBNRM can enhance social and economic systems at the same time that it safeguards the natural environment.

The social impacts and economic outputs of the resource use can be distributed in ways that the community decides are most appropriate (Davis, 2008). Third, collective management of a resource can build social capital by bringing local people together in ways that might not have occurred otherwise. Through the discussions and decision-making processes required to manage a forest, fishery, or watershed, relationships are built that can strengthen the community and enhance its ability to achieve collective goals (Ostrom, 1999). A host of other benefits to a community's environmental, economic, and social systems can be made available through CBNRM, and these are described in detail in the expansive literature that addresses the subject (see: Bradshaw, 2003; Armitage, 2005; Brosius et al., 2005).

In spite of the theoretical benefits of CBNRM, several practical issues, such as limited access to capital or capacity, can prevent community projects from achieving their often lofty goals (Ambus, 2008). CBNRM does not guarantee that a resource will be more sustainably managed (Davis, 2008), or that a community will experience great economic benefit (Bradshaw, 2003). As will be explored in the remaining sections of this paper, the community forestry experiment in British Columbia has certainly experienced its share of these difficulties.

Community forestry, as one form of CBNRM, has been embraced more fully in some areas of the world than others. In Mexico, up to 40 percent of timber production is achieved through logging operations controlled by agrarian communities (Taylor, 2003). In India, more than 80,000 community groups have

engaged in a form of community forestry through the Joint Forest Management Program (Agarwal, 2009). In developed countries, community-based natural resource management has been slower to take root, though authors such as Bradshaw (2003) and Teitlebaum et al. (2006) have described a limited number of cases in both the United States and Canada that have involved the devolution of power to local governments or First Nations.

British Columbia's experiment with community forestry may be one of the most comprehensive examples of CBNRM in North America. As far back as the 1945 Royal Commission of Inquiry into the forest resources of British Columbia (the Sloan Commission) calls were made by prominent citizens for more involvement of communities in forest management (Mitchell-Banks, 1997). At that time, BC's first municipal forests were established in Mission and North Cowichan. Through the 1990s, a series of tree farm licenses and volume-based forest licenses were also aquired by communities such as Lake Cowichan, Nootka Sound and Revelstoke (Howlett, 2000). Similar to many community forestry projects elsewhere, these initiatives had the common objective of retaining a high percentage of economic benefits within the geographic bounds of the community; however, the specific nature of BC's forest industry produced other objectives that have less often been witnessed in foreign experiments with CBNRM. Such objectives included mitigating the cyclical nature of the logging sector, thereby promoting regional economic and social stability. Opportunities for alternative uses of the forested landscape were also a motivation, as many citizens of BC expressed an interest in the option to recreate or collect non-

timber forest products in areas within the timber harvesting land base (Gunter, 2000). These first community forest ventures represented attempts, spearheaded by the communities themselves, to work within the industrial tenure system to achieve local goals for land management.

Eventually, the BC government itself demonstrated its support for alternative modes of forestry. The launch of the Community Forest Pilot Project in 1998 confirmed the government's confidence in the approach as a potentially powerful tool to bring stability and amity back to British Columbia's forests (Ambus, 2000). The Pilot Project issued five-year Probationary Community Forest Agreements to eleven communities as a means of testing the viability of CBNRM within the context of BC's working forests (Teitlebaum et al., 2006). The agreements were by no means examples of complete devolution, as the provincial government retained significant amounts of regulatory power (Bradshaw, 2003; Charnley & Poe, 2007). As with any form of forest tenure in BC, under the *Forest Act (*R.S.B.C. 1996, C. 157), the agreement holder was required to meet a set of expectations regarding timber production, environmental protection, and public accountability. The program remained, none the less, a promising option for many struggling forest-dependent communities.

Support for the program grew quickly, partially due to the effort shown by academic, political and civil organizations to evaluate the initiative. Landmark studies by authors such as McCarthy (2006), Gunter (2000), and Hayter (2003) drew attention to the program, and community forestry more generally, and identified feasible options for improving the efforts of both the provincial

government and the pilot communities. Independent consultants also completed a government-sponsored review of the program in 2006, which produced a set of 36 recommendations surrounding diverse issues including program governance and tenure arrangements (Meyers Norris Penny LLP & Enfor Consultants Ltd., 2006). The Ministry of Forests and Range (MOFR) has since implemented several of these recommendations (MOFR, 2007a). The British Columbia Community Forest Association, an association formed by holders of Community Forest Agreements, has acted as a liaison between the MOFR and the agreement holders, and has contributed to the community forestry movement by building relationships among communities, and by facilitating several important changes in the regulatory requirements associated with the tenure.

More than a decade after its inception, the Pilot Project has evolved into the Community Forest Agreement Program (CFAP), under which the MOFR has granted tenure to almost 40 communities (MOFR, 2010). In March 2009, the five-year Probationary Community Forest Agreement was abolished and all Community Forest Agreements are now initially awarded for a term of 25 to 99 years. CFAs are now the main route through which the provincial government transfers timber rights to communities (Weber, 2008). The official objectives of the CFAP are:

- provide long-term opportunities for achieving a range of community objectives, values and priorities;
- diversify the use of and benefits derived from the Community Forest Agreement area;
- provide social and economic benefits to British Columbia;

- undertake community forestry consistent with sound principles of environmental stewardship that reflect a broad spectrum of values;
- promote community involvement and participation;
- promote communication and strengthen relationships between Aboriginal and non-Aboriginal communities and persons;
- foster innovation; and
- advocate forest worker safety.

(MOFR, 2007b, 3)

Critics of the community forestry initiative in British Columbia continue to provide mixed reviews. As several authors have described, the Pilot Project and the CFAP have not been the unmitigated success that many hoped they would be. Several community forests have struggled to stay afloat financially, while others have had to reassess their visions for what their operation might provide in terms of jobs, funding, or environmental protection (McIlveen & Bradshaw, 2005; McCarthy, 2006). None the less, the program continues to expand, and more communities are attempting to become involved.

One apparent reason for the popularity of the CFAP is the opportunity it provides for rural populations to develop their own agenda for the management of local resources (Pinkerton et al., 2008). This aspect of the program is essential to the various innovative projects that community forests are engaging in across the province. Traditionally, logging operations in BC have paid very little heed to co-situated resources; however, as will be explored in the remaining sections of this paper, some communities are using their tenures to exert control over more than just their trees.

3: RELATIONSHIPS BETWEEN COMMUNITY FORESTS AND SOURCE WATER PROTECTION IN BC

Community forests are in a unique position in British Columbia in that they receive support from stakeholders, shareholders, and government alike for adopting more holistic management systems that consider multiple forest values. In fact, the Community Forest Agreement Program has the official objective of diversifying the benefits derived from forested areas (MOFR, 2007b). Accordingly, some communities are using their Community Forest Agreements to gain control over their drinking watersheds, and to manage them in a way that promotes long-term security of water quality, quantity, and timing of flow. These forests are therefore engaging in a form of integrated resource management (IRM).

IRM considers whole systems in its approach, and explicitly accounts for connections between water, air, and land, as well as relationships between the environment, the economy, and society (Bellamy & Johnson, 2000; Davis, 2007). The concept aims to improve environmental decision making by enhancing communication and collaboration between the managers and stakeholders that represent various resource sectors (Walther, 1987). The IRM approach, promoted by the Rio Declaration on Environment and Development as a practical route to sustainability, has become particularly prevalent in the management of water resources (Carter, Kreutzwiser & de Loe, 2005). Often referred to as river

basin management or watershed management, integrated water resources management has the potential to mitigate conflicts between water users, engage stakeholders at the grassroots level, and, ultimately, improve water quality (Davis, 2007).

Many Canadian regions have experimented with watershed-scale initiatives focused on securing water quality or quantity. For example, Alberta's Watershed Planning and Advisory Councils develop plans and coordinate activities to link land and water management (Ivey et al., 2006). Ontario's Conservation Authorities produce watershed and sub-watershed plans in an attempt to advise local governments regarding development in sensitive areas (Carter et al., 2005).

IRM in watersheds can be especially attractive for communities that wish to protect their drinking water sources. Source watersheds, because of their proximity to settled areas, often coincide with lands that witness a variety of uses, including recreation, timber harvest, or agriculture—all of which can have detrimental impacts on water quality (Davies & Mazumder, 2003). Increased levels of coordination among various users of source watersheds can provide more security concerning the availability of safe drinking water, and, ultimately, public health (Mitchell, 2005).

Recognition of the importance of source water protection has expanded markedly across Canada over the past decade (Simms, Lightment & de Loe, 2010). A series of tragic events in the early 2000s brought a great deal of attention to the influence that environmental conditions in source areas have over

drinking water quality as it is delivered to the consumer. Perhaps the most well known of these incidents occurred in Walkerton, Ontario, where, in May of 2000, over 2,300 people contracted E. coli poisoning from their drinking water (O'Connor, 2002a). The origin of the bacteria was traced to agricultural activities in the watershed; hence, one of the main recommendations put forth by a public inquiry into the incident stressed the need to implement a new approach to drinking water management that focused on protecting water quality, first and foremost, at the source (O'Connor, 2002b).

The O'Connor report on the Walkerton incident sparked a series of revisions to the legal frameworks that govern drinking water provision not only in Ontario, but across other Canadian provinces as well. In British Columbia, the introduction of the *Drinking Water Protection Act* (S.B.C. 2001, C. 9), represented a shift from a formerly disjointed approach to water management. Whereas, previously, a system of legislation regulated drinking water provision and source protection as separate processes, the Drinking Water Protection Act encouraged the integration of these activities by mandating source assessments, water monitoring, and, in unusual circumstances, the preparation of Drinking Water Protection Plans[2]. British Columbia's new Living Water Smart policy, released in 2008, also advocates a source-to-tap approach to drinking water management,

[2] Under the *Drinking Water Protection Act*, Drinking Water Protection Plans have the power to address significant threats to source watersheds and to bring stakeholder interests into watershed management. These plans, however, are only legally required as a last resort, when no other Drinking Water Protection Act provisions can address the problem with the water supply. As of 2007, no Drinking Water Protection Plans had been prepared (Nowlan & Bakker, 2007).

and promises corresponding reforms to the province's water laws (Nowlan, 2008).

Inherent in the provincial shift to stronger source water management policies was the recognition that many resource activities negatively affect water quality and quantity. In BC, logging represents a significant risk to drinking water. A considerable proportion of BC communities' source waters lie within areas that are also within the timber harvesting land base. In addition, many of these waters originate in unstable, mountainous terrain that is particularly vulnerable to disturbances (Summit Environmental Consultants Ltd., 2002). Activities associated with logging, such as road building and timber removal, can alter water temperature and flow regimes, potentially causing erosion, stream sedimentation, and nutrient loading (Binkley & Brown 1993; Harr & Fredriksen, 2007; Herbert, 2007). Suspended sediments can facilitate the transport of bacteria and cysts. For communities with municipal water treatment systems, elevated levels of particulate matter in source waters pose challenges at the treatment stage, as filtration and high amounts of chemicals may be needed to prepare the water for human consumption (Davies & Mazumder, 2003). For communities without sophisticated treatment systems, a common situation in BC, logging-related water quality issues pose an even greater, and more direct, risk to human health.

More and more, communities are concerned about factors beyond logging in their forested source watersheds. The increasing incidence of forest health issues and forest fires in BC, attributed in part to climate change (Nitshke &

Innes, 2007), also presents hazards to water sources. Forests that exhibit low levels of diversity or resilience are vulnerable to pest infestations that can kill entire stands of trees, leading to changes in snow accumulation and melt patterns. Such changes can cause fluxes in runoff that alter sediment transport and timing of flow (Boon, 2008). Forest fires also contribute to erosion and changes in stream temperature. Further, wildfire management activities, such as retardant application and access road construction, can deposit materials into steams that negatively influence water quality (Landsberg & Tiedemann, 2000).

As Boyd (2003) discusses, fee simple ownership by the community is the most obvious route through which a local population can manage the land surrounding its source watershed. In British Columbia, however, much of the forested land base is owned by the provincial crown and is not available for community ownership. Under conditions of provincial crown ownership, citizens typically expect that provincial laws will protect the public by restricting the types of activities that pose substantial risks to the environment or public safety. Some BC residents point to a historic system of 'watershed reserves' as an important legal tool for source water protection that the provincial government has since abolished (Koop, 2006). These reserves were granted under the provincial *Land Act* (S.B.C. 2002, c. 69) and have been the subject of at least two cases where citizens brought forth litigation that questioned the legality of forestry in watersheds. Contrary to the statements of some activists, however, reserves designated under the *Land Act* only preclude other activities that are governed by

this same act, and not timber harvest, mining, or agriculture (Nowlan & Rolfe, 2001)

The *Forests and Range Practices Act* (S.B.C. 2002, c. 69) (FRPA) is now the primary vehicle through which the crown regulates forest practices on public land. FRPA allows for the designation of 'community watersheds'—portions of land deemed by the Minister of Agricultural and Lands to be suitable for additional protection. Community watersheds previously designated under the *Forest Practices Code of British Columbia Act* (R.S.B.C. 1996, C. 159) are also continued under FRPA. Logging can occur in community watersheds, but they benefit from more restrictive forest practices, such as larger riparian setbacks or machine-free zones, than those require on other areas on crown land. The designation requires that forest licensees meet specific government-mandated objectives regarding water management. According to the *Forest Planning and Practices Regulation* (B.C. Reg. 4/2010), unless otherwise established under the *Forest Practices Code*, the *Government Actions Regulation* (B.C. Reg. 582/2004), or by the Minister of Environment, these objectives state that no forestry activity may have an adverse impact on water quantity or quality in a manner that would pose a risk to human health considering existing levels of treatment. FRPA includes an additional caveat, however, that this objective "applies only to the extent that it does not unduly reduce the timber supply from British Columbia's forests" (s. 8.2). Not all source watersheds in British Columbia are classified as community watersheds. Those that serve only a few households often do not meet the requirements of the designation, and are considered

‘domestic watersheds’ instead. FRPA does not provide the same protection to domestic watersheds.

A long history of contraventions under FRPA and its predecessor, the Forest Practices Code (see, e.g., MOFR, 2007c; MOFR, 2008b; MOFR, 2009) , indicates that, despite the highly regulated nature of the logging industry, citizens reliant on drinking water originating in logged areas may have a genuine cause for concern. Many of BC’s communities have been actively opposing logging in source watersheds for decades. As Pinkerton et al. (2008) discuss, the Kootenay region of southeast BC, especially, has witnessed a strong history of this type of resistance. During the 1980s and 1990s, conflict between Kootenay residents and logging corporations raged over permits to log in drinking watersheds. Organizations such as the BC Watershed Protection Alliance, centred in the Slocan Valley, were instrumental in promoting citizen-led demands for increased environmental accountability in the logging sector (Pinkerton et al., 2008).

Beginning in the mid-1990s, some communities recognized and acted on an opportunity to protect their drinking water by working within the forest sector, instead of against it. The Kootenay communities of Creston and Kaslo both acquired forest licenses with at least a partial mandate to gain control over local source watersheds (CVFC, n.d.; Gunter, 2000). While the initiatives were moderately successful, they were encumbered by the restrictions imposed by the forest license form of tenure.

When the Ministry of Forests introduced the Community Forest Pilot Project in 1998, an alternative option emerged for communities hoping to gain

control over their source watersheds. The Pilot Project made new land available and offered an opportunity for communities to exercise greater control over how their watersheds are logged. The option not only provided benefits to communities, but also the Ministry of Forests. In some cases, public relations issues had prevented timber removal from sensitive watersheds for decades. Many parties hoped that community forests would open up these areas to at least *some* logging, while at the same time providing local jobs and allowing for diverse uses of the land base (Anderson & Horter, 2002). Communities such as Sechelt and Harrop-Procter were among the first to take advantage of the water-protection possibilities that the Community Forest Agreement Program offered. Since CFAs are area-based, entail stumpage fees that are lower than industrial tenures, and do not have some of the administrative requirements imposed on other tenures, both Kaslo and Creston, recognizing the additional benefits of the CFA, recently switched to this form of tenure.

4: METHODOLOGY

I performed an evaluation of three community forests' approaches to source water protection. I worked with an interdisciplinary research team to gather data through semi-structured interviews with a variety of stakeholders in each community forest. The team also used site visits, document review, and participant observation to gather primary research. I corroborated my own findings, to the extent possible, with those of other studies during the data analysis process. I used some aspects of 'grounded theory' when analysing data, but I modified the approach in accordance with the objectives of the study.

4.1 Links to Interdisciplinary Research

This study is part of a wider, overarching project that seeks to answer the question: *how and to what extent can community forests act as a new model for forest management in British Columbia?* Although I developed the research questions and objectives for the present study within the last two years, the overarching project has been in development since 2006. Faculty members involved from Simon Fraser University's School of Resource and Environmental Management included Dr. Evelyn Pinkerton, Dr. Murray Rutherford, Dr. John Welch, Dr. Ken Lertzman, and Dr. Ajit Krishnaswamy. Co-investigators at the University of British Columbia's Faculty of Forestry were Dr. Thomas Maness and Dr. Ron Trosper. These individuals met with each other at various points,

consulted with the British Columbia Community Forests Association and spoke with representatives of several community forests to define general research questions, select potential study sites, and recommend approaches to data collection. A field team consisting of one professor and four graduate students, each concerned with a somewhat distinct aspect of community forestry, collected primary data for the project over a ten-week period. One other professor joined the team for one week.

The involvement of such a diverse group of individuals created an interdisciplinary research environment that is all too rare. In addition, the attempts these individuals made to involve their research subjects in determining the purpose of the project make the present study, and others that will be produced under the overarching project, a unique contribution to research on community-based resource management.

4.2 Case Study Sites

The research group collectively spent time in five communities, and I travelled to one additional site alone. I chose to use the experiences of three of these sites for the primary case studies in my research. The research group selected these three case study sites based on a number of factors. First, the McBride, Harrop-Procter and Creston community forests are among the oldest and most well-established in the province, allowing for the collection of a rich history of data, and for the examination of issues that have developed over a longer term. Second, these cases are all within the Interior Cedar-Hemlock biogeoclimatic zone (MOFR, 2008c), indicating that differences in ecosystem

function and composition would not greatly affect the research results or the ability to compare experiences across cases. Third, and important to my specific research interests, the three community forests have historically shown very different approaches to source water management—for two, water quality is a primary consideration, while for one, it is less central to the day-to-day operations of the forest. The variation in ideologies and corresponding management practices strengthened the diversity and, therefore, general applicability of the analysis and findings for this project. I provide a description of each case study site below (Figure 1, Table 1).

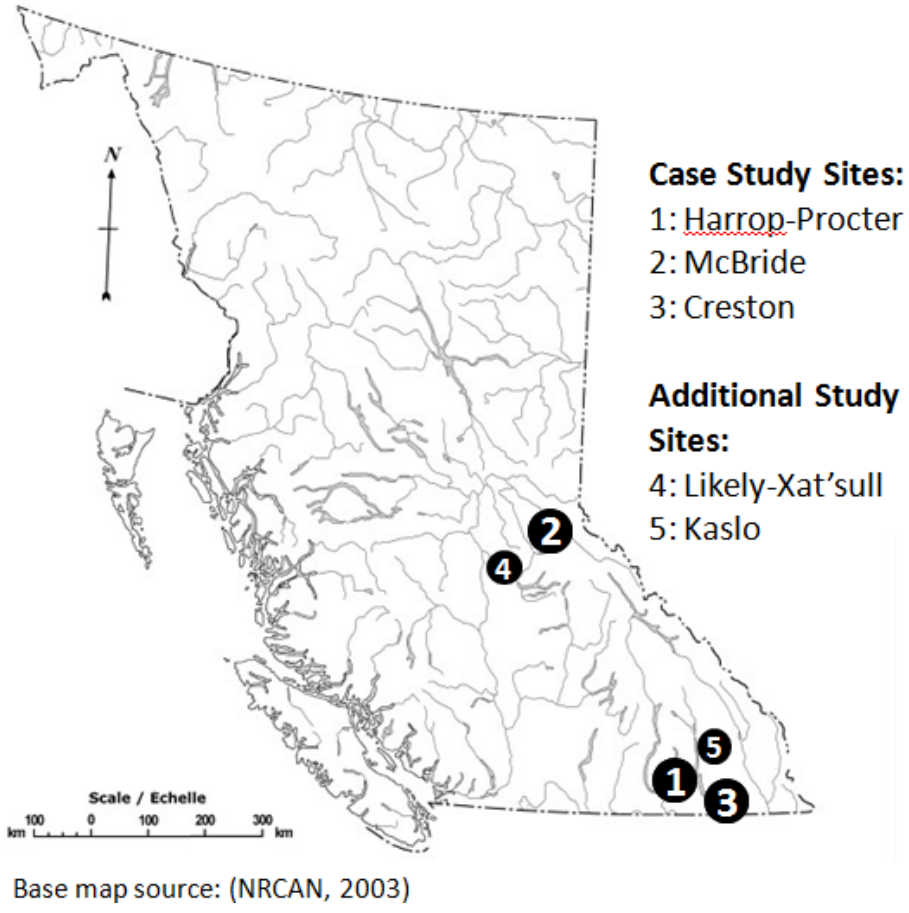

Figure 1: Location of study sites

The Harrop-Procter Community Forest (HPCF), on the west arm of Kootenay Lake, is a small community forest that has an area of 10,680 hectares, and a negotiated allowable annual cut[3] (AAC) of just over 2,600 cubic metres. The MOFR awarded the forest a pilot agreement in 1999, and converted it to a CFA in 2007. HPCF is one of very few community forests in BC to be run by a cooperative, and also one of a small number of provincial tenure holders to have acquired Forest Stewardship Council (FSC) certification. The Harrop- Procter Community Cooperative is closely associated with the Harrop-Procter Watershed Protection Society, which is the legal entity that originally applied for the community forest license. The villages of Harrop and Procter are both small, rural communities, with a combined population of approximately 650, that are only accessible by ferry. As a result, economic development in the surrounding area is very limited, and the communities remain somewhat isolated from other population centres in the West Kootenay region.

The McBride Community Forest (MCF), situated approximately 200 kilometres southeast of Prince George, was the largest community forest in our sample. MCF's community forest agreement stipulates an area of 60,860 hectares, and an allowable annual cut of 50,000 cubic metres. The MOFR awarded McBride a pilot agreement in 2002 and a CFA in 2007. In recent years, MCF also acquired a Salvage Non-Replaceable Forest License, which allows for additional harvest of salvageable timber in specified areas adjacent to the CFA. McBride Community Forest Corporation, which is run by a board of elected and

[3] Allowable annual cut is the amount of timber, as determined by the MOFR, that is permitted to be removed from a defined area each year (MOFR, 2008a).

appointed stakeholders from the village council and the populations of surrounding communities, operates the community forest. McBride originally developed as a railway town, but it presently relies on forestry, agriculture and adventure tourism to fuel its economy. It has a population of approximately 800.

The Creston Community Forest (CCF) is located just 15 kilometres from the US border, in the southeast corner of the province. The forest has an area of 17,639 hectares, and an allowable annual cut of 15,000 cubic metres. CCF is operated by the Creston Valley Forest Corporation, which has a board of directors made up of three equal shareholders that represent various interests in the community. The forest originated with the award of a non-replaceable forest license in 1997 and in 2008 CCF acquired a probationary Community Forest Agreement. The non-replaceable forest license is currently in the process of being retired. Creston is the largest of the communities profiled in this study, with a population of over 5,000. The Creston valley benefits from a diverse industrial base, with agriculture, forestry, tourism, retirement communities, and a major brewery all contributing to the local economy.

Table 1: Characteristics of case study sites

Community	Population	Size (ha)	AAC (m^3)	Management Structure	Year of Inception
Harrop-Procter	650	10,860	2,603	Cooperative	1999
McBride	740	60,860	50,000	Corporation	2002
Creston	5,000	17,639	15,000	Corporation	1997

4.3 Additional Study Sites

I spent a significant amount of time in two other community forests, in addition to the case study sites listed above, during the field research portion of this project. Likely-Xat'sull (LXCF) and Kaslo (KCF) Community Forests were initially selected as study sites for the same reasons that the primary case studies were selected, and I originally researched the experiences of these forests with the intention to use them as additional case studies. Upon completion of data collection, however, the results for these two forests were not adequately rich or useful for the research objectives of the present study. Likely-Xat'sull operates in drinking watersheds, but does not explicitly recognize its role as a source water manager. Correspondingly, it has not adopted any exceptional planning approaches or forest practices as part of its operations. Kaslo also manages source watersheds and, unlike Likely-Xat'sull, acknowledges drinking water protection as a significant portion of its mandate; however, only one week was available for field research in Kaslo and I was not able to triangulate most findings during that period. Accordingly, I used the results from LXCF and KCF to inform this study, but gave them less focus than those from HPCF, MCF, and CCF. Likely-Xat'sull and Kaslo's experiences have been incorporated into the section of this report that discusses common themes and recommendations for improvement of management conditions.

4.4 Evaluation Methods

4.4.1 Approach to Evaluation

In order to develop recommendations to improve the management of drinking water in BC's community forests I first identified a set of goals, objectives and criteria relating to source water protection and long term viability. I then used these criteria to evaluate the success of the case study community forests. Evaluations are important tools for resource managers as they assist in determining how well an organization has met its objectives, and they help identify strategies to improve management efforts (Conley and Moote, 2003). As Conley and Moote (2003) explain, there are several ways to approach the evaluation of a program or initiative. Comparing the effort to its own goals, to other similar programs, or to ideals are all common and accepted methods, but each approach has its own set of limitations. For example, comparing a program to its own goals assumes that these goals are identifiable, appropriate and broadly accepted. Comparisons across programs require that the various cases have an adequate number of common characteristics to provide for a meaningful assessment. Evaluations that focus on ideals based on established theories tend to gloss over the realities of 'on the ground' implementation. To overcome these limitations, my research combines all of the methods discussed by Conley and Moote (2003), so that one approach could make up for the shortcomings of another.

4.4.2 Evaluation Objectives

I assessed the community forest initiatives by evaluating their performance against a set of goals and objectives relating to source water protection and long-term viability. I then used the results from the evaluation together with the results of previous studies of community forestry in BC to develop a discussion of institutional and contextual factors that either facilitate or impede effective source water management under a CFA. The factors that I considered in this discussion originate from four sources—the community forest's own informal and formal governance arrangements, formal governance arrangements imposed by the provincial tenure system or forestry legislation, local social systems, and the forest economy. I did not discuss the ecological context in which the community forest operates in this section, since such a discussion would be beyond the scope of this project, and since other members of the research team thoroughly address this issue in their studies.

I developed a set of objectives and evaluation criteria that I considered common to all community forests who manage source watersheds. I also developed a set of objectives that are specific to each study site. I describe this evaluation protocol below.

4.4.2.1 Common Goals, Objectives and Criteria

I used a suite of 'common' goals and objectives to evaluate each forest's performance in regard to a standard set of expectations, and to make comparisons across the four case studies. I identified the common objectives from relevant provincial legislation and policy documents, and from the literature

on collaborative and community-based resource management, especially that which specifically pertains to water management initiatives.

Floress, Mangun, Davenport, and Williard (2009) state that evaluators must measure organizational success by assessing both the longevity of the entity, and the management outcomes for which it is responsible. Therefore, I developed the set of common objectives with two overarching goals in mind. First, in order to assure acceptable watershed conditions, community forests must engage in forest planning and practices that protect source water. Second, community forests must conduct their operations in a way that assures their long-term viability as the entity with management authority in the watershed. This second goal requires that the community forest succeed as a community-based organization, a business, and a timber licensee. I discuss the consequences of failure in any one of these categories below. To summarize, any significant problem with maintaining community support, financial viability, or legal compliance could affect the community forest's ability to operate effectively and efficiently. In extreme cases, a serious failure could prevent the community forest, directly or indirectly, from fulfilling the terms of its CFA—a problem that could lead to the suspension or cancellation of the Agreement. Below, I provide a table that summarizes all the common goals and objectives, along with the criteria I used to assess them. I then discuss each objective separately, and justify my decision to include it in the evaluation framework.

Table 2: Objectives, criteria, and measures for Goal #1

Goal #1: Ensure forest planning and practices result in acceptable water quality, quantity, and timing of flow

Objective	Criteria	Measures
Engage in forest planning and practices, for the following activities, that promote source water protection -timber harvest -reforestation -road building -pest/disease management -interface fire management	Water quality, quantity, and timing of flow conditions within the community forest land base have been considered satisfactory by water users since the community forests' inception	-Interview results suggest that community members have been satisfied with watershed conditions since the community forest's inception -Current provincial water notices (if applicable) describe favourable watershed conditions -Recent monitoring reports (if applicable) confirm acceptable watershed conditions within the community forest
	Efforts to monitor the effects of forest activities on watershed conditions are undertaken by the community forest	-Forest planning documents show evidence of monitoring efforts -Monitoring initiatives are discussed in interviews
	Responses to threats (or perceived threats) to watershed conditions have been addressed by the community forest to a degree that satisfies all stakeholders	-Interview results (especially from community members not directly associated with the community forest) suggest that community members are satisfied with the community forests' response to water management concerns
	Forest planning and practices in source watersheds meet accepted standards for logging activities that protect source water quality	-Forest planning documents demonstrate a commitment to implementing forest practices that promote source water protection -Discussions in interviews (especially from community forest staff and contract loggers) suggest that the community forest is implementing forest practices that protect source water -Site visits confirm that appropriate practices have been implemented on the ground -Forest Practices Board audits and Compliance and Enforcement evaluations have identified no problems with water management activities in the community forest

Table 3: Objectives, criteria, and measures for Goal #2

Goal #2: Ensure long-term viability of the community forest as the entity managing the source watershed

Objective	Criteria	Measures
Adopt effective governance arrangements, including sound decision making structures and stakeholder engagement strategies	The community forest demonstrates governance arrangements that serve the common interest. Additional protocols for effective community-based governance are also met.	-Interview results (especially from community forest staff and board members) describe the implementation of effective governance arrangements -Community forest governance documents describe effective governance arrangements
	Confidence in governance arrangements is expressed by community forest staff/board members/community members	-Interview results suggest that community forest staff and board members are comfortable with governance arrangements -AGM/board meeting minutes confirm internal confidence in governance arrangements - Interview results (especially from community members not directly associated with the community forest) suggest that public perception of the community forest and its management strategies/governance arrangements is positive
	Level of conflict between community forest and other community groups is manageable, and does not affect the community forest's potential for success	-Interview results identify a manageable level of conflict surrounding the community forest -Documented formal complaints are minimal and warranted
	Level of public engagement with community forest is high	-Interview results describe a high level of public engagement -Meeting minutes (if available) show good attendance levels
Achieve financial stability and funding for water management initiatives	Financial stability is demonstrated by community forest.	-Interview results demonstrate that community forest staff and board members are comfortable with the financial situation of the community forest -Reasonably low levels of debt are discussed -Annual reports (if available) confirm a sound financial position, or manageable levels of debt, given the state of the BC forest economy
	Commitment to implementing promising funding strategies is shown amongst community forest staff/board members	-Sound money-making strategies are discussed in interviews (especially by community forest staff) -Annual reports, meeting minutes, etc., show genuine progress

Objective	Criteria	Measures
		towards implementing sound money-making strategies -Literature on specific funding strategies verifies genuine potential for the strategy to benefit the community forest
Fulfil legal requirements in order to maintain authority over watershed	Environmental management requirements, including harvest commitments, are met by community forest	-Interview results (especially from MOFR personnel) suggest these requirements have been met
	Legislated planning and payment requirements are met by community forest	-Interviews results (especially from MOFR personnel) suggest these requirements have been met
	Performance on official audits and evaluations has been satisfactory	-Record of Forest Practices Board complaints is minor -Record of Compliance and Enforcement contraventions is minor

Engage in forest planning and practices that promote source water protection

As already discussed in section 3 of this report, primary forest activities including timber harvest, reforestation, and road building can have negative impacts on watershed conditions (Herbert, 2007). Pest infestation or fire can also bring on changes in ecosystem conditions that can lead to poor water quality or quantity (Gluns & Toews, 1989; Boon, 2008). Community forests, as entities tasked with managing a source watershed, are required by the expectations of the populations they serve to consider these risks when planning forest activities, and to implement appropriate forest practices accordingly. I identified maintenance or improvement of watershed conditions as the first common objective for evaluation because, ultimately, a successful source water protection initiative would result in positive impacts on the ground. Leach et al. (2002) agree that the most important accomplishment for community-based watershed management partnerships is the enhancement of water quality, quantity, and

timing of flow. Kenny (2001) also highlights the fact that ecological impacts are the primary indicator of success for many government-led initiatives, and they should therefore be the primary indicator of success for community-led initiatives as well.

The first criterion for this objective relates to current and historic watershed conditions. It is adapted from the *Forest Planning and Practices Regulation*, (B.C. Reg. 4/2010) which states that the default objective for forest management in watersheds is that primary forest activities do not have a material adverse impact on water quality, quantity, or timing of flow. The time frame for my evaluation of this criterion was limited to the period that the community forest has been managing the watershed in question. Due to the interview-focused nature of fieldwork for this project, and to the limitations of my own personal knowledge of forest ecology, I did not conduct detailed field assessments to measure this criterion, or any other for this objective. Regardless, since the availability of baseline data is very limited for remote, rural communities, such an assessment would be difficult to accomplish. Instead, I assessed performance on this criterion primarily through local residents' perceptions of watershed conditions, an approach that Leach et al. (2002) support. Current government-administered drinking water notices and drinking water inspection reports, if available, also provided information on the current state of the watershed. I also consulted water monitoring reports from the community forest or other monitoring agencies where available.

The second criterion evaluates the community forest's commitment to monitoring, a practice that is considered essential to the implementation of robust, adaptive watershed management (Leach et al., 2002). I assessed performance on this criterion by reviewing references to monitoring activities in official community forest documents and interviews.

The third criterion relates to the community forest's ability or willingness to respond to threats to watershed conditions. Threats can be either real or perceived. Capacity for problem solving, as with commitment to monitoring, is an important aspect of any community-based organization that practices adaptive management (Brunner et al., 2005). I assessed performance on this criterion primarily through the results of interviews, especially from interviewees who were not directly associated with the community forest, and who therefore were more likely to represent the perceptions of the wider community.

The fourth criterion qualitatively assesses the community forest's commitment to accepted standards for forestry that protects source watershed conditions. I developed this set of norms through conversations with foresters over the course of fieldwork. It includes: perform hydrological assessments prior to beginning harvest, harvest in a manner that results in a low equivalent clearcut area[4], build minimal roads, employ practices that promote minimal site disturbance, maintain adequate riparian buffers, remove wildfire hazards, and treat diseased stands. I assessed performance on this criterion by reviewing forest planning documents, examining provincial Forest Practices Board audits,

[4] Equivalent clearcut area is an index used by foresters to understand the effects that forest cover removal can have on the hydrology of a watershed. It is expressed as the percentage of a watershed's naturally forested area that has been removed (MOFR, 2008a)

and Compliance and Enforcement reports, and analysing results from interviews and site visits.

Adopt effective governance arrangements, including sound decision making structures and stakeholder engagement strategies

The first common objective under the second goal concerns decision making processes. Process evaluations are important because they allow evaluators to determine which factors bring about certain outcomes (Conley & Moote, 2003). Specifically, the objective evaluates the community forest's governance arrangements. More equitable and accountable governance strategies are an important factor that sets community-based forest management apart from more traditional approaches (Menzies, 2004). Indeed, the official objectives for the Community Forest Agreement Program itself reflect a need to "promote community involvement and participation" in resource management (MOFR, 2007a, 7). Several authors acknowledge that strong and effective governance arrangements are a key determinant in the success of community-based resource management initiatives (e.g., Kenney, McAllister, Caile & Peckham, 2000; Ivey et al., 2006). In the case of community forestry, failure to operate as an effective community-based organization could lead to the loss of local support or the forest's 'social license to operate'. Such a shortcoming would likely hinder the community forest's chances for success by reducing the amount of volunteer labour made available, by forcing community forest staff to spend more time addressing complaints and concerns, or by even precluding the forest from carrying out its operations.

The first criterion for this objective tests the community forest's commitment to institutional arrangements that serve the common interest and adherence to other general expectations for effective community-based resource governance. This study used a test of the common interest, adapted from Brunner et al. (2003) and Brunner et al. (2005), that compares community forest decision making structures and stakeholder engagement strategies to the following best practices:

- community forest board members and staff are representative of the community as a whole
- community forest board members and staff maintain accountability to the community and support transparency in decision making
- expectations of board members and community members for what the community forest will accomplish are reasonable, achievable, and compatible with other community goals
- community forest decisions, and the outcomes of those decisions, are acceptable to the community as a whole
- outcomes of community forest decisions are compatible with more comprehensive community goals
- governance arrangements are adapted if issues arise with community representation, accountability, or outcomes, that threaten the ability of the organization to serve the common interest

Authors such as Leach and Pelkey (2001), Kenney et al. (2000) and Frame, Gunton, and Day (2004) describe other standard protocols that have been associated with effective community-based resource governance. These protocols require that the community forest:

- demonstrates effective leadership

- has access to high quality information to aid with decision making
- has a set of well-defined decision making process protocols
- shows a commitment to educating and training board members and the community as a whole
- shows a commitment to learning and applying lessons to its operations

I assessed performance on each of the best practices and protocols listed above by reviewing official governance policies of the community forest, and by analysing interview results. I gave priority to interview responses from community forest staff and board members, as those people were likely to have more in-depth knowledge of governance arrangements. I used results from interviews with the broader community to corroborate and test results from the staff and board.

The second criterion for this objective evaluates the confidence amongst community forest staff, board members, and the community as a whole in the ability of current governance arrangements to serve the interests of the community forest as an entity that manages source water. I measured this criterion by reviewing interview results and examining the minutes of annual general meetings hosted by the community forest, if available.

The third criterion assesses the level of conflict between the community forest and other community groups. Leach and Pelkey (2001) state that low levels of conflict are key to the success of a community-based watershed management entity, as harmony and common understanding foster good interpersonal relationships and high levels of trust. At the same time, some authors recognize that disagreement over environmental policies can also incite

productive discussions and lead to more robust management strategies (e.g., Lee, 1993). I assessed levels of persistent conflict, and the constructiveness of public objection, by analysing documented formal complaints, including Forest Practices Board complaints, and by reviewing interview results.

The last criterion for this objective relates to the level of public engagement with the community forest. Williams and Ellefson (1997) state that the success of any collaborative resource management effort can be defined by its ability to elicit and maintain involvement from individuals and organizations. Leach and Pelkey (2001) agree that public engagement is a strong contributor to effective management of resources by community-based organizations. I assessed performance on this criterion by reviewing meeting minutes and interview results.

Achieve financial stability and maintain funding for water management initiatives

The second objective associated with the goal of ensuring long-term viability of the community forest is to achieve financial stability. A significant dilemma regarding funding for community forests has been well articulated by one forest manager who said “we’re managing for seven or eight identifiable values, and the only one that pays is timber, and yet the most important values are the ones that aren’t priced in the marketplace” (British Columbia Community Forest Association, 2009b). Source water protection costs money, and community forests, as logging businesses, do not receive public funds to carry out their operations. Failure to operate a successful business could lead to the loss of perceived legitimacy of the community forest as a resource management

agency. It could also impede the fulfilment of the community forest's responsibilities as a timber licensee because legislated planning, monitoring, and payment requirements all require adequate levels of funding. Financial failure could also result in bankruptcy and termination of the community forest or its tenure. Sommarstrom (2000) and Leach and Pelkey (2001) confirmed these realities when they found that access to stable funding was one of the primary factors affecting the success of collaborative watershed management organizations.

The first criterion for this objective asks simply whether the community forest demonstrates financial stability. Stability is a term that is difficult to define, but for the purposes of this study, I assessed it through the level of comfort that forest staff and community members expressed with the ongoing financial status of the community forest. Thus, I used interview results, especially from people most familiar with the finances of the community forest, as the primary measure of stability. I used annual reports, if available, to corroborate interview results. Any assessment of financial stability for companies involved with logging in British Columbia must consider the current state of the provincial forest economy. In reality, moderate levels of debt are commonplace in the industry and I did not therefore view them alone as indicators of a financial crisis.

The second criterion for this objective assesses the community forest's commitment to implementing promising funding strategies or moneymaking schemes. The Community Forest Guidebook, published by the BC Community Forest Association, states that a good business plan and secure funding sources

are essential tools that help community forests achieve their stewardship goals (Gunter, 2004). A stable community forest must achieve economic self-sufficiency and the most obvious route to attaining such a status is through operating the forest as a business enterprise, an approach advocated by Salafsky et al. (2001). I assessed the community forest's commitment to achieving financial stability through interview results, especially from forest staff, and through a review of the community forest's internal documents, including annual reports and meeting minutes. I corroborated the potential for any strategies discussed in these sources to provide genuine economic benefits through the literature that addresses the subject.

Fulfil legal requirements in order to maintain authority over the watershed

The final common objective for evaluation assesses the community forest's fulfilment of its legal obligations under the Community Forest Agreement and relevant pieces of legislation. Sections 76 and 77 of the *Forest Act, (*R.S.B.C. 1996, C. 157), state that a community forest agreement can be suspended or cancelled if the agreement holder does not adhere to the provisions of their agreement, those of the *Forest Act*, or those of the *Forest and Range Practices Act*, (S.B.C. 2002, c. 69).

The first two criteria for this objective ask whether the community forest has met legislated environmental management, planning, and payment requirements. The *Forest Act* stipulates that a Community Forest Agreement must require its holder to pay stumpage, pay waste assessments, submit a management plan, carry out audits, and make information available to the public

(s. 43.3). The *Forest and Range Practices Act* requires that a community forest agreement holder submit a Forest Stewardship Plan (s. 3), prepare a site plan before harvesting timber (s.10), adhere to regulated requirements for primary forest activities (s. 21-31, 46-58), and meet the objectives outlined by government for forest management (s. 149). I assessed performance on these two criteria primarily through interview results, and placed priority on statements from Ministry of Forests and Range personnel.

The third criterion for this objective requires that the community forest's performance on official audits and evaluations has been satisfactory. The Compliance and Enforcement Branch of the Ministry of Forests and Range publishes annual reports that detail all enforcement actions taken by the branch. The Forest Practices Board (FPB), which audits formal complaints from the public regarding timber licensees, also publishes summaries of its investigations. I used information from these two sources to assess the community forest's performance for this criterion.

4.4.2.2 Community-Specific Objectives

I also identified a set of case-specific objectives for each community forest studied in order to evaluate each forest's performance in regards to achieving its own water management goals. I identified case-specific objectives from official forest planning documents, including management plans and forest stewardship plans, and from interviews with forest personnel and community members. A community-specific objective was only included if it was directly related to source water management, and if it was not addressed in the common objectives. I

based the criteria for evaluation of all community-specific objectives on the results of interviews and a review of documents produced by the community forest, government sources, and other studies available to the public.

4.4.3 Scoring

I scored the community forest's achievement of each objective using the scores, *met*, *partially met*, or *not met*. I considered the community forest's performance on each relevant criterion when awarding a score. Scoring decisions were made qualitatively, but some general rules applied. If all criteria were realized, I awarded a score of *met*. If most of the criteria were realized, I awarded a score of *partially met*. If most of the criteria were not realized, I awarded a score of *not met*. The nature of any failures were also considered when awarding scores. For example, if a community forest achieved two of four criteria, yet one of the criteria was not achieved because of a significant shortcoming that the forest did not recognize or attempt to improve, I would award a score of *not met* instead of *partially met*.

4.5 Data Collection

I took a qualitative approach to the research to ensure that the full diversity of the forests' experiences was recognized because, as Patton (2002) illustrates, in many situations when researchers use case studies to examine an issue, there is no "average case". In order to understand the full complexity of the issue at hand, I anticipated that conversations and personal interaction would contribute

more to the study than would surveys, questionnaires, or quantitative ecological analysis.

In order to complete the field research for this project, the interdisciplinary research team spent two weeks in each of the primary case study communities performing interviews, participating in site visits to logged areas, gathering case-specific documents that were not otherwise distributed to the public, and conducting occasional focus groups. Although some interviews or site visits were conducted by only one or two members of the team, most research activities were undertaken as a group. Since all team members had their own specific research interests, the conversations and learning opportunities that the group collectively engaged in covered a broad array of topics related to forestry, environmental management, and community dynamics. As a result, a two-hour interview might only have addressed source water management issues, in the most specific sense, for fifteen minutes. Although less interview time was spent specifically on water than might have been the case in an independent research project, the broad interviews helped me to identify many more factors that directly affected the community forests' abilities to manage drinking water than I originally anticipated.

Semi-structured interviews provided the majority of data for this project, and many authors consider them to be one of the most effective methods for qualitative data collection (Marshall & Rossman, 1999; Babbie & Benaquisto, 2002). Rather than approaching the interview with a defined list of questions, a list of topics for discussion guided the conversations. The research team

discussed some general topics in all interviews, and chose specific topics based on the position of the interviewee. I have provided a list of sample discussion topics in the appendices of this paper. Semi-structured interviews allow for the development of rich understandings of concepts and perceptions, and they permit the respondents' perspectives to unfold as they understand them, not as framed by the researcher. Interviews also have the benefit of producing large quantities of data quickly, and of allowing for immediate follow-up regarding unclear issues.

The accuracy of interview results can be an issue in qualitative research and, of course, research participants were not obligated to tell the truth during conversations. Accordingly, results that I considered during the data analysis process were triangulated not only across different data sources within each case study, but for findings that apply at wider scales, across cases as well. Triangulation improves the validity of results in qualitative research, and allows, to some extent, for transferability of findings to areas that the study does not explicitly address (Marshall & Rossman, 1999; Berg, 2004). The amount of time and resources required to complete an interview can also lead to a small sample size (Babbie & Benaquisto, 2002), although, in the present case, the amount of time the research team spent in each community allowed for over 75 interviews to be completed over the course of field work.

We also formed two focus groups as part of the data gathering process. Focus groups elicit results that might not otherwise come up in one-on-one conversations because the atmosphere that is created as a result of the

presence of multiple group members allows participants to form and express opinions that may be sparked through interaction among peers (Marshall & Rossman, 1999; Babbie & Benaquisto, 2002). The facilitation of the focus groups used in this study followed an approach commonly referred to as Participatory Rural Appraisal (PRA). As described by the Food and Agriculture Organization,

> PRA is a growing combination of approaches and methods that enable rural people to share, enhance and analyse their knowledge of life and conditions, to plan and act and to monitor and evaluate. The role of the outsider is that of a catalyst, a facilitator of processes within a community which is prepared to alter their situation (Sontheimer, Callens & Seifrert,1999, 13).

PRA advocates a more humble approach to research than some traditional methods by assuming that rural people possess vast amounts of localized knowledge and insight that outsiders do not have (Chambers, 1981). By encouraging these people to actively engage in a research project—through, for instance, collectively mapping important resources or social institutions—instead of acting merely as passive participants, researchers are able to extract more of this valuable knowledge than would be available otherwise. While we found both focus group sessions based on the PRA model provided excellent data (in quality and quantity), we could not organize more because of the logistical constraints associated with bringing together many busy people at one time.

We selected interviewees and focus group members through a combination of theoretical and snowball sampling methods. Theoretical sampling, a technique from the grounded theory approach, involves seeking out participants that contribute to the elaboration of the researcher's understanding of important concepts. The researcher identifies these concepts as 'important' via

the data analysis that occurs in the field throughout the data gathering process (Corbin and Strauss, 2008). Snowball sampling is not specifically tied to any research approach, but involves identifying participants through conversations with other participants (Berg, 2004)—in the case of this project, we literally asked an interviewee, “who do you think we should talk to next?” Both sampling methods helped to ensure that the limited resources available for field work remained focused on the people who possessed knowledge that was deemed desirable for the project at hand. Ideally, a research project will only halt sampling once ‘saturation’ occurs. Saturation indicates that the researcher understands all concepts and results to a degree that would minimize the potential contribution of additional interviews or focus groups (Corbin & Strauss, 2008). Given the time and financial constraints of this project, saturation could not be fully achieved, although the research team concluded that we collectively understood enough about our various research subjects to be able to provide valuable evaluations and recommendations.

During the fieldwork, the research team also participated in several site visits to areas within the community forests. These visits provided a visual illustration of some of the concepts that we discussed during the interviews. They also allowed, to some extent, for the comparison of management objectives on paper with forest practices on the ground. Document review was also an integral aspect of the research process. As explained by Marshall and Rossman (1999), reviewing archival material, such as meeting minutes or historic forest management plans, can expand the researcher’s knowledge of the setting within

which research subjects operate, and can also corroborate the results gathered from interviews.

4.6 Data Analysis

When conducting data analysis for this project, I used a process that blended techniques from 'grounded theory' philosophy and more general qualitative research approaches. Originally proposed by Glaser and Strauss in the late 1960s, grounded theory advocates a 'reverse scientific method' approach to research (Babbie & Benaquisto, 2002). In other words, it stresses the value of engaging in research without any preconceived notions about the project outcome or potential results. The approach requires maintaining an open mind to all possible explanations of a problem throughout the research process. A researcher therefore only forms hypotheses, or theories, after analysing the data, and then tests their theories against all results from all sources (Blaikie, 1993).

To the informed reader, my use of grounded theory to complete an evaluation may seem inappropriate. Indeed, there are aspects of the approach that I did not use because they would not have served the objectives of this study. In particular, the principles of grounded theory advocate that the researcher inductively generate categories for coding data. Other research approaches, especially those specific to evaluative studies, utilize coding strategies that impose externally developed categories on the data (Berg, 2004). I borrowed from both of these schools of thought by developing codes both deductively and inductively. I chose this approach because I believed that a study that was framed as an evaluation would need to answer several key questions. In

other words, it was not enough to just ‘see what the data told me’, but it was also necessary to ‘see what the data told me about many specific subjects’.

I developed some categories from the literature surrounding community forestry and drinking water management. These codes were used to serve my first research objective, *evaluate how successful current initiatives have been at protecting source water through Community Forest Agreements.* I developed other codes from the data. These codes were generally used to serve my second research objective, *examine what aspects of the legal, institutional, social, economic, and ecological context of community forests either enable or hinder effective source water management.* Thus, I used grounded theory to inductively generate hypotheses regarding factors that either inhibit or facilitate objective achievement. In this way, I allowed the research results, instead of the literature, to tell me what factors were important to the success of each community forest.

Throughout the coding process, I explored relationships among the categories. I also tested potential findings or theories that emerged from this exploration continuously against all subsequently analyzed data. This process, termed ‘constant comparison’, is central to the grounded theory approach, and is a key factor in maintaining validity in qualitative research (Corbin and Strauss, 2008).

During the data analysis process, I also assigned a number to each interview in order to be able to personally identify the source but still maintain the anonymity of the interviewee in this report. Each notation consists of a number

identifying the community forest with which the interviewee was associated and a number identifying the specific interview.

5: CASE ONE: HARROP-PROCTER COMMUNITY FOREST

5.1 History and Local Motivations for Source Water Protection

The villages of Harrop and Procter have been involved for decades in a battle to protect their surrounding environment from the potentially damaging effects of logging. Beginning in 1985, when the provincial government announced plans to log the Lasca Creek drainage, a watershed just west of the villages, concerned residents came together to form the Harrop-Procter Watershed and Community Protection Committee. The Committee lobbied the local Ministry of Forests (MOF) office to try to develop policies to minimize the implementation of destructive logging practices in the area. The strategy proved ineffective, as the MOF's plan to log Lasca moved forward, largely unchanged (HPWPS, 2009). In response, residents of Kootenay Lake's communities, including Harrop and Procter, organized a series of blockades and protests that resulted in the arrests of several participants. In the early 1990s, activists found hope in the development of a proposal to protect the area as a wilderness park under the BC government's 1990s Protected Areas Strategy (Western Canada Wilderness Committee, 1992). The original proposal failed, but in 1995, after the Western Canada Wilderness Committee demonstrated its support for the proposal, the BC government announced the creation of the West Arm Wilderness Park. The park

protected the area surrounding Lasca Creek, but it did not include the land directly above the villages of Harrop and Procter (HPWPS, 2009).

The Harrop-Procter Watershed Protection Society (HPWPS) was formed in 1996 as a collection of citizens determined to keep industrial clear-cut logging out of the surrounding area, this time with the specific objective of protecting their local source watersheds. The BC government had recently announced its intentions to commence the Community Forest Pilot Project, and the HPWPS took hope in the potential for community forestry to bring nearby forested land under local control. The society submitted an application for a Community Forest Pilot Agreement, which the MOFR initially refused. The HPWPS spent the next two years gathering local support, embarking on public education campaigns, and working with the Silva Forest Foundation, a Kootenay-based organization committed to ecosystem-based forest management, to develop a plan to manage the neighbouring watersheds. Subsequently, the MOFR invited the HPWPS to submit a new application for a pilot agreement, and, in 1999, the tenure was finally granted (HPWPS, 2009). The MOFR converted HPCF's pilot agreement to a Probationary Community Forest Agreement in 2004 and, in 2007, to a long-term Community Forest Agreement.

The process leading up to the creation of the Harrop-Procter Community Forest was long and arduous for the residents of both villages. Not surprisingly, the history of the forest continues to inspire local residents who are concerned about the condition of their drinking water sources. Most of the residents we interviewed, when asked what they value most about the community forest, cited

their confidence in the community forest's ability to effectively manage their drinking water sources. The research team noted, however, that the villages of Harrop and Procter have engaged in community forestry reluctantly—many people stated that they would rather the area be a park, though they understood that the community forest was the best option available to help the communities achieve source water protection. As one community member stated, "if the West Arm Wilderness Park had expanded through Irvine Creek (to include all of Harrop-Procter's source watersheds), then I think that would have been so wonderful and I think we all would have thought that would have been so wonderful and that's not how it happened" (Interview 1-7). Some local residents also recognized the important opportunity for interface fire management that the community forest makes available. A large fire that was very close to entering one of the watersheds managed by the community forest in 2003 solidified the community opinion that wildfire poses a significant risk to drinking water quality and flow regimes.

As two very small, unincorporated municipalities, Harrop and Procter do not benefit from a central filtration or treatment system. There are 36 springs and creeks with water licenses for drinking water supply within the community forest land base, only one of which is classified as a community watershed (HPCC, 2001). Residents draw all drinking and irrigation water directly from surface sources that primarily include Harrop, Narrows, and Procter creeks. As such, the quality and quantity of water that originates from land managed by the community forest is of critical importance to the villages. Such a high level of direct reliance

on watershed conditions is a major motivating factor for the management strategies undertaken by the community forest.

5.2 Evaluation and Discussion

5.2.1 Common Objectives

5.2.1.1 Objective #1: Engage in Forest Planning and Practices that Promote Source Water Protection

Interview results and a review of monitoring documents indicated that water quality, quantity, and timing of flow in the watersheds managed by HPCF have been satisfactory since the inception of the community forest. The majority of respondents expressed their approval of the community forest's approach to drinking water management, and could think of no water-related incidents within the past several years that they associated with logging activities in source watersheds. I discuss the opinions of community residents who did not agree with this position below. A 2009 third-party water monitoring report confirmed that logging activities in the community forest appeared to have had no significant impacts on watershed conditions during the years 2005 to 2008 (Quamme, 2009).

The Procter Creek Improvement District, which represents water users on the only community watershed managed by HPCF, is currently under a boil water advisory, and has been for several years. Details of the advisory confirm, however, that it was issued not because of identified source water contamination, but because the level of filtration and disinfection applied by the Improvement District is below the provincially-recommended level of treatment.

Interview results indicated that HPCF recognizes the value of monitoring programs and has been actively engaged in the standardized assessment of watershed conditions. The community forest leads a monitoring program that has now been in effect for 12 years. Earlier portions of this program were carried out by an independent consulting agency, and the results of that part of the study are described above. The purposes of the monitoring program are to collect baseline water quality information and flow data, and to examine changes in these parameters as forest development occurs in the watersheds.

Acute threats to water quality recognized by community members in interviews primarily stem from wildfire risk management. Several local residents, including both those who are involved with the governance of the community forest and those who are not, discussed their opinion that HPCF was not addressing this issue to the degree that they considered necessary. Perceived threats to water quality have also played a role in board discussions over the past two years. HPCF made a recent decision to employ what some residents consider to be conventional logging practices in order to remove primarily dead or diseased timber from an area infected by mountain pine beetle (figure 2). A small percentage of community members indicated that they perceived the plan to be a threat to watershed conditions, as it involved the removal of a large amount of timber as compared to other cut blocks in the community forest. Since forest staff decided to go ahead with the harvest plans, despite the opposition, it is not surprising that the residents who disagreed with the approach felt that HPCF did not adequately address their concerns. It is important to note that

community forest staff originally designed the block to act as a wildfire break between two watersheds, and are refraining from completely restocking the area in order to maintain that function. Forest staff also noted that harvests in this block present the lowest risk to water quality of all previous blocks in the community forest because the area is on top of a ridge, on dry bedrock, and far away from any watercourse. Therefore, some respondents' perceptions of the threat this block poses to ecological health in the community forest may be exaggerated.

Figure 2: A controversial cut block in the Harrop-Procter Community Forest

Interviews with community forest staff indicated that, apart from the cut-block discussed above, Harrop-Procter generally takes a very restrained

approach to logging. In its forest planning and operations, HPCF strives to adhere to the principles of ecosystem-based management, and it uses a land-management plan prepared by the Silva Forest Foundation as a guide to forest development (Silva Forest Foundation, 1999). The 'Silva Plan' identifies a large percentage of HPCF's land base as inoperable due to sensitive local ecological conditions. It recommends an annual allowable cut that is far below what the Ministry of Forests and Range would typically recommend for such an area. Community residents used the results of this plan to negotiate a very low AAC during discussions with the MOFR prior to the signing of HPCF's Community Forest Agreement. In interviews, it became obvious that several community members, especially those that have been involved with the community forest since its inception, consider the negotiation of a low AAC to be one of their most important accomplishments, as it reflects, on the surface at least, their vision of logging watersheds in a very controlled manner. Multiple board members suggested that HPCF's AAC might increase in coming years, due to 'ground-truthing' of the forest's initial ecosystem based plan. A more thorough knowledge of the land base has led forest staff to believe that the ecosystem could support higher harvest rates, and that removal of more trees could actually improve the health of the forest. One community member stated their support for this opinion when they said, "I think that conversation needs to be opened up and it needs not to be about AAC and it has to be about ecology" (Interview 1-4).

Site visits and a review of forest planning documents indicated that specific forest practices employed by the community forest generally fit within

common expectations regarding logging to protect source water. A hydrologist completed an assessment for the entire forest during HPCF's initial planning stages, and the forest manager consults this report before harvesting in any source watersheds. Interviews with forest staff indicated that, in general, cut blocks are not located within any significant proximity to drinking water sources, and high levels of retention, as compared to other forest licensees, are prescribed in site plans. Mealiea's (forthcoming) review of forest planning documents submitted to the MOFR confirms this finding, as most of the harvests done by HPCF since 2004 use 'intermediate cutting[5]' or 'shelterwood[6]' silvicultural systems. Interview results also indicated that some of the roads built within the community forest are narrower than traditional logging roads, in order to minimize potential sources of sediment. In other cases, skid trails are lengthened and reinforced in order to eliminate roads altogether. Encouraging contractors to limb and top trees in the bush also reduces potential sediment issues associated with roads, as it prevents the need for large landings. The community forest has also used cable yarding as a strategy to minimize soil disturbance. The research team confirmed interview results regarding forest practices through site visits to logged areas in HPCF.

The controversial cut block discussed above was HPCF's first large-scale attempt to use logging to control forest health issues on the land base. Interviews with board members suggested there is some resistance in the community to

[5] Intermediate cuttings are small harvests that occur before a more significant harvest that leads to regeneration of the stand. Intermediate cuts are usually designed to improve the stand and enhance the quality of growing conditions for timber (Mealiea, forthcoming)

[6] "A silvicultural system in which trees are removed in a series of cuts designed to achieve a new even-aged stand under the shelter of remaining trees" (MOFR 2008b, 93)

implementing any similar plans in the future, partly due to some residents' assumptions that such high levels of harvest would negatively affect local ecological health or the long-term timber supply in the area. In reality, many experts in the field of ecosystem-based forestry agree that some large forest openings can benefit ecosystems at the landscape level by mimicking patterns of natural disturbance. In addition, since dead standing timber is lost from the timber supply regardless of whether it is harvested or not, this resistance may be unwarranted. A recent update of research results indicates that HPCF has received funding from the Regional District of Central Kootenay to engage in activities to reduce fire risk surrounding the villages of Harrop and Procter. As discussed above, however, at the time of field work, interface fire management was an issue that some residents said the community forest had not adequately addressed. For these reasons, I awarded Harrop-Procter a score of *partially met* for the objective of engaging in forest planning and practices that promote source water protection.

Factors that Inhibit Objective Achievement

Detrimental tenure arrangements

Harrop-Procter board members spoke of several instances, especially in the formative stages of the community forest, which clearly demonstrated that HPCF was attempting to engage in a type of forestry that was, at that time, anomalous in the provincial system. Specifically, efforts to negotiate a lower AAC and include a formalized commitment to ecosystem-based management in HPCF's license document were largely unsupported by Ministry personnel, and took years to accomplish. Though the relationship between the community forest

and the local MOFR office has greatly improved in recent years, staff and board members still acknowledged that there are issues with BC's forest policies and timber tenure system that occasionally hinder the ability of HPCF to achieve its goals. For example, some board members spoke of the provincial Mountain Pine Beetle Strategy, which required the community forest to develop and enact its own area-specific pest-management plan, as a significant drain on resources.

Conditions under which HPCF operates

The difficult economic conditions HPCF operates under have produced a debt-load that staff recognized as problematic in interviews. Payment commitments to lenders significantly reduce the funds that are available to engage in the type of innovative forest planning and practices that some community members said they would like to see implemented. I further discuss HPCF's debt-load below.

Preservationist nature of community

Some community members with higher levels of forestry knowledge, interestingly, spoke of the preservationist nature of the Harrop-Procter community as a barrier to effective source water protection. One resident described this concern by stating, "it's sort of one of these things where the low AAC is so important because of the history of the high AACs but the reality is, is it ecologically the best thing to be doing here? I'm not sure. I'm not sure if the AAC that we have set is in the end serving our interest to maintain clean water. Because if we have catastrophic fire we don't have clean water" (Interview 1-4).

Factors that Facilitate Objective Achievement

Formation of strategic relationships

Interviews with forest staff indicated that Harrop-Procter has established relationships with experts in the fields of ecosystem-based management and forest hydrology. These types of specialized skills are often lacking in small, rural communities (Gunter, 2000; Ambus, 2008), yet they are essential to any logging operation that has the primary objective of protecting source water. It became apparent through interviews in Harrop-Procter and with the experts themselves that these types of relationships with skilled professionals help the community forest to access the type of information it needs, without necessarily having the in-house expertise.

Trust in employees

Board members spoke of several lessons that the community forest has learned over time. One important realization was that the board cannot micromanage the forest manager or contract loggers. These people need to be able to make quick, sometimes unilateral decisions in order to respond to the variable conditions they work in. In order to release decision-making authority, however, board members realized that there must be a high level of trust in the forest manager or contract logger. They spoke, therefore, of the importance of hiring selectively, and of ensuring that personnel understand the vision of the community forest before they are given operational freedom. The value of a trusting relationship between a community and the people it expects to carry out its vision on the ground, has been recognized by other authors (Silva Forest Foundation, 2006).

Well-defined mission

A review of forest planning documents, including HPCF's management plan and 'Silva Plan' indicated that the community forest benefits from a very well-defined vision that helps orient all activities toward the goal of source water protection. For example, the first 'Agreement Holder's Goal' listed by HPCF in its management plan is, "ensure forest management does not impact water quality, quantity and timing of flow in the short- and long-term" (HPCC, 2001, 3). Gunter (2000) states that a well-articulated mission is essential to successful community forestry. HPCF board members spoke of their realization, early on, that it is important to stay focused on the vision of the community forest and avoid distracting 'side-projects' that consume valuable financial and volunteer resources. One person summarized the lesson by stating, "we did craft sales, ... we made teas, we had a small herb farm going, we had a couple of plots throughout the community at different people's houses. It was an extreme drain on volunteer manpower...and eventually, we did have to adjust. We can't do this. We don't – you know, we don't have the infrastructure. We don't have the manpower" (Interview 1-7).

Beneficial tenure arrangements

Respondents identified two aspects of HPCF's Community Forest Agreement as beneficial to helping the community forest achieve its source water protection goals. First, the area-based nature[7] of the agreement excludes any licensee except HPCF from operating in the area's source watersheds. Second,

[7] The BC timber tenure system includes both area-based and volume-based tenures. Area-based tenures grant exclusive harvest rights for a defined volume within a defined area. Volume-based tenures grant several licensees rights to harvest a defined volume within a given Timber Supply Area (MOFR, 2005a).

the MOFR's recent elimination of its minimum cut control[8] policy means that HPCF has the option not to log in years when environmental or economic conditions are unfavourable.

Low level of forest dependence in community

The villages of Harrop and Procter have historically demonstrated very low levels of dependence on logging to fuel their economies. The forest industry employs only a few local residents. In interviews, staff and board members recognized this community characteristic as a benefit, as HPCF does not experience the same pressures to log in marginal terrain, or under marginal economic conditions, that other forests may be subject to. HPCF is therefore able to operate in a manner that best serves the requirements of source water protection, instead of the needs of unemployed contract loggers.

High level of community support

The Harrop-Procter community is small, isolated, and highly motivated to protect source water. In interviews with non-residents, locals were recognized as having generally progressive views relating to resource management. One knowledgeable community outsider stated, "the Kootenays have been very active for years and years and years in defying industrial management, particularly in watersheds" (Interview 3-3). The community forest therefore enjoys relatively high levels of support for its activities, and a relatively low level of conflict

[8] Minimum cut control policies formally required that licensees harvest a volume within ten percent of their AAC over a five-year period. If the licensee failed to meet this requirement, their AAC was reduced accordingly (Anderson and Horter, 2002). This provision was recently eliminated, but there is still substantial pressure on community forests , from the MOFR, to cut their AAC. In addition, The Forest Act still states that a licensee's unused quota can be distributed to another licensee for a one-time 'license to cut', but this provision is rarely implemented.

surrounding decisions. It became apparent throughout the research process that these factors have contributed to successful management outcomes by fostering high levels of volunteerism, and by ensuring that forest staff can focus their resources on implementing ecosystem-based management, instead of conflict resolution protocols. The importance of volunteerism in helping community forests commence and maintain operations has been recognized in other studies (Gunter, 2000; Silva Forest Foundation, 2006)

5.2.1.2 Objective #2: Adopt Effective Governance Arrangements, Including Sound Decision Making Structures and Stakeholder Engagement Strategies

The Harrop-Procter Community Forest is operated by the Harrop-Procter Community Cooperative (HPCC), which receives policy guidance from the Harrop-Procter Watershed Protection Society (HPWPS). The intersection of the two boards creates a unique institutional environment and dynamic for community-based resource governance. Both organizations have a membership that is open to all local residents and an elected board of directors that makes decisions regarding activities within the scope of the organization. The size of both boards of directors varies depending on the level of community interest and willingness to engage in volunteer activities.

The community forest also has a small number of staff that varies depending on the funding available and the type of activities HPCF pursues. At the time of research, the community forest employed one full-time forest manager, one part-time value-added coordinator, and one part-time administrator. The staff, especially the forest manager, receive guidance from the

HPCC regarding forest planning, management decisions and funding strategies to pursue.

Several local residents and board members stated that they consider most members of both the HPCC and the HPWPS boards of directors to be environmentalists. Several community interests are represented on the various boards, including people involved in the forest industry, and people whose occupation has little to do with forestry or any form of resource management. Both organizations attempt to be highly inclusive in their recruitment of members, but some respondents from the wider community suggested that very few people who oppose any part of HPCF's mandate or operations attempt to get involved. In addition, a rule that at least 50 percent of HPCC board members must also sit on the board of the HPWPS somewhat limits the number of people, or interests, that are represented within the community forest's governance structure, but this was not recognized as a problem by any interviewee.

The boards maintain accountability to the community through Annual General Meetings, which are held separately for each organization. Semi-annual newsletters and a website also help to distribute information about HPCF's operations. Staff maintain accountability through the boards, which meet internally on a monthly basis. The HPCC board has a Forest Management Committee that meets regularly with staff to discuss and approve forest management decisions. A Business Committee and Human Resources Committee fill similar roles for those aspects of HPCF's operations. Thus,

multiple community interests sign off on decisions of the forest manager. The boards support transparency by keeping most meetings open to the public.

The set of expectations discussed by stakeholders for what the community forest might achieve were high, as they involve protecting the water resource under a system that is designed to manage another resource altogether. Nevertheless, the fact that the community forest is making genuine progress towards achieving these expectations demonstrates that they are still realistic. Some community members spoke of an evolution in expectations over time, as local residents became more aware of what it takes to run a successful forestry business, and as they began to understand that logging can be completed in a manner that does not necessarily affect water quality.

In interviews, most board members agreed that HPCF has a good record of implementing decisions that are made and supported by most participants in HPCC and HPWPS. As will be discussed below, only a few instances in Harrop-Procter's history have caused noteworthy conflict within and amongst the boards or other community groups. The HPWPS exists specifically to ensure that community forest decisions and outcomes are compatible with the community's goal of protecting source water quality. The rule that at least 50 percent of HPCC directors must also serve on the board of the HPWPS theoretically guarantees HPWPS's influence in this regard. Multiple board members expressed concern, however, that the activities of these two organizations have gradually merged since the inception of the community forest. A minority of respondents were of

the opinion that the HPCC has captured the HPWPS, resulting in the weakening of the society's role as 'watershed monitor'.

Interview results indicated that governance arrangements in HPCF have evolved over time to reflect lessons learned by the two boards. The community forest introduced a rule to disallow forest staff to serve on either organization's board of directors in response to a concern that the priorities of certain staff members were outweighing the priorities of the board or community as a whole. Some board members suggested that, in the months following data collection for this study, HPWPS would work to reassert its watershed protection role by pushing for more institutional separation from HPCC and engaging in water-related activities unrelated to community forestry.

Several respondents from both inside and outside the organization stated that the quality of HPCF's leadership was excellent. These people recognized the forest manager, chair of the HPCC, and chair of the HPWPS as intelligent, motivated, and energetic people with the ability to make significant progress towards achieving the source water protection goals of the villages of Harrop and Procter. The current forest manager, especially, was appreciated by many community members and MOFR representatives alike as an individual that is able to bridge the gap between the management approaches of the community and the provincial government—a benefit that has not always been available to HPCF.

The community forest has put significant resources into gaining access to the type of information that helps staff make effective forest management

decisions that promote source water protection. A forest-wide hydrological assessment and ten-year monitoring program are examples of information that the HPCF uses to make decisions. Forest staff and community members have also developed strong relationships with local ecosystem-based forestry experts, on whom they often call for guidance.

The HPCC has a well-defined set of ‘rules of association’ that outline, in an official manner, the board’s decision-making protocols and its relationship with the HPWPS. I could not determine whether a similar set of rules exists for the HPWPS.

Board members discussed occasional attempts by HPCF to educate HPWPS members, HPCC members, and the wider community about forest ecology and the logging industry, though these respondents recognized that the community forest’s educational role needs to be strengthened. Some board members cited a lack of forestry-specific knowledge within the organization’s membership as an occasional hindrance to effective, efficient decision making. Community forest staff, especially the forest manager, demonstrated a commitment to continuous learning about forestry and drinking water management. This same commitment, however, was not as noticeable amongst board members.

Staff and board members in Harrop-Procter expressed general satisfaction with the community forest’s governance arrangements as they exist at present. A moderate amount of disagreement centred on the intersection of the HPCC and HPWPS boards. Some respondents felt that the separation of the two

organizations was unnecessary and placed a heavy burden on the time commitments of board volunteers. Others felt that the separation was necessary and should be strengthened to prevent HPCF from straying from its original source water protection mandate. Community members other than forest staff and board members stated that they had the same general opinions about the governance of the community forest. Most local residents that we spoke with said that they had adequate opportunity for involvement, though not everyone elected to take that opportunity

Interview results suggest that Harrop-Procter benefits from a relatively low level of conflict surrounding its forest management, governance, and business policies. The one exception relates to the controversial cut block discussed in the evaluation of the first objective, which resulted in a divide between the community members who were more committed to preservation and those who were more committed to active management of the forest. The harvest was done in partial fulfilment of the community forest's commitments under the provincial mountain pine beetle management strategy, and partially to create a fire break between two watersheds. The harvest involved silvicultural practices, including low levels of retention, that were uncharacteristic of Harrop-Procter's operations up until that date. A few community members shared their belief that the decisions that went into planning and operationalizing the harvest for that block compromised the community forest's commitment to watershed protection. Most other local residents said that they believe the harvest strategies were in line with modern understandings of ecosystem dynamics, and that they were necessary to fulfil the

community forest's tenure requirements. Interview results suggest that the meetings and discussions that occurred in association with that conflict appear to have had a positive impact on HPCF's overall operations, as they incited learning opportunities about the realities of forest ecology and the economics of the forest industry.

The level of public engagement with HPCF is high as compared to other community forests. One board member estimated that ten percent of the population has been involved with either board at one time or another. Some respondents recognized the community forest as an important public organization in the villages of Harrop and Procter, which, because of their size and isolation, do not benefit from the type of well-developed civic community that may exist elsewhere.

In general, the governance arrangements adopted by the Harrop-Procter Community Forest display a strong commitment to effective community-based resource management. For that reason, I awarded HPCF a score of *met* for this objective.

Factors that Inhibit Objective Achievement

Problematic board structure

Some respondents discussed the nature of the relationship between the Harrop-Procter Watershed Protection Society board and the Harrop-Procter Community Cooperative board as limiting the number of local residents willing to get involved with community forest governance. The rule that at least fifty percent of board members from the HPCC must also sit on the board of the HPWPS placed a heavy burden on volunteers. Thus, board representation has remained

more static than might be desirable for an organization that demands a strong volunteer commitment, and fresh energy amongst its directors, in order to carry out innovative and well-planned forestry. Though not explicitly recognized by interviewees, this policy also limits opportunities for representation of all community interests within HPCC.

Limited volunteerism in community

Some respondent discussed their frustration with the fact that, while the wider community generally supports the community forest, most community members were unwilling to act as a board member for either the HPWPS or the HPCC. One current representative expressed their desire to relinquish their seat on the board, and also their inability to do so because of concerns that no other community member would be willing to fill their spot. Volunteer burnout is common in community-based organizations, and the ability to attract and maintain the involvement of local residents is a significant problem faced by many community forests (Silva Forest Foundation, 2006).

Cohesive viewpoint of board members

In interviews, community forest board members discussed a relatively cohesive set of personal beliefs surrounding environmental management. Some interviewees and focus group participants stated that, in a way, the unity of both boards discourages people with alternative viewpoints from getting involved with the forest. These people believed that dissenters fear they will be socially isolated and their opinions may not be genuinely considered. A full spectrum of values is important for all community-based resource management institutions to

consider, as it helps to ensure that the institution is able to define and serve the common interest (Brunner, 2002).

High personal investment in outcomes

A local population that is deeply and personally motivated to protect their surrounding resources, as is present in Harrop-Procter, can lead to problems that prevent the community forest from serving the common interest. For example, interview results from HPCF indicated that a former staff person with a high level of investment in community forest activities had, in the past, attempted to gain control over the collaborative decision making process—not necessarily because they had bad intentions, but because they felt so strongly that they knew what course of action would be best in helping HPCF achieve its goals. This finding was corroborated by the Silva Forest Foundation's (2006) report on community forests in BC.

Factors that Facilitate Objective Achievement

High personal investment in outcomes

While high levels of personal investment in the outcomes of the community forest have, in some ways, hindered operations, in other ways, they have greatly benefitted the governance of HPCF. For example, interview results indicated that several board members, because of their commitment to the mission of HPCF, had willingly been involved with the community forest for many years. It was apparent that such high levels of continuity in leadership helped facilitate institutional learning processes that greatly improved the organization's ability to gather lessons and apply them to its activities.

Adoption of unofficial roles

The adoption of unofficial 'roles' by certain board members, over time, was also recognized by some respondents as an important factor in contributing to well-ordered, equitable, and effective decision making. These roles were described by one person as the 'eagles', or those who steadfastly advocate the original vision of HPWPS, the 'monitors, or those who ensure that the organization adheres to its process rules, the 'bridge-builders', who understand many perspectives and help groups with different world-views to understand each other, the 'communicators', who help build the profile of HPCF in the community, and the 'bulldogs', or those who work relentlessly with MOFR personnel, lenders, or other groups to ensure that HPCF achieves its vision. The importance of well-defined roles in community forest management, whether official or unofficial, has been described by the Silva Forest Foundation (2006).

Cooperative governance structure

Finally, the decision to initially organize the community forest's operating entity as a cooperative instead of a corporation or another type of governance structure was recognized in interviews with board members as a factor that helps HPCF enact its vision of careful logging and watershed protection. Each member of a cooperative has only one vote in collective decisions, and membership is open to all community members. Thus, the structure guarantees that no one interest will dominate the types of decisions that are made by the entire HPCC membership.

5.2.1.3 Objective #3: Achieve Financial Stability and Maintain Funding for Water Management Initiatives

Interviews and a review of other studies suggest that Harrop-Procter has struggled to achieve this objective since the community forest's inception. Initial visioning documents produced by the community forest discussed plans to implement enterprise strategies that would provide the funding necessary to perform careful, ecosystem-based forestry. These schemes included developing a company that produced and sold botanicals, and operating an ecotourism business. While HPCF made genuine attempts to implement both of these strategies, they were ultimately abandoned, because, as discussed by long-term board members, they required too much volunteer effort and resulted in only minimal economic gain. Instead, community members focused their energy on obtaining a number of grants and loans that allowed HPCF to fulfil the planning and business start-up requirements that were necessary to get the forest up and running. These financial contributions were significant, but nevertheless, the Harrop-Procter Community Cooperative remained several hundred thousand dollars in debt as of the summer of 2009. In reality, that level of debt is not unusual in BC's forest sector, though the persistence of the finance problem in Harrop-Procter is not as common. Regardless, staff and board members discussed their opinion that HPCF is in a good economic position for the future, as all major fees associated with initial inventory and planning have now been paid.

The community forest has put significant effort into developing a value-added strategy that, if effectively implemented, would help HPCF to attain a

higher return for its timber. ”Value-added” is a term often used within the forest industry to describe manufacturing processes, beyond simply converting raw logs into dimensional lumber, that help forest communities access a higher financial return on wood products. Almost all respondents agreed that, for a community forest that has such a low AAC, yet is committed to a type of forestry that is so expensive, ensuring that a considerable portion of harvested wood is sold at a price premium is a necessity. Value added strategies are being pursued by many community forests (Anderson and Horter, 2002), and they are widely recognized as an approach that could help stabilize resource-dependent communities and improve the state of BC’s forest economy as a whole (Hoberg, 2001; DeLong, Kozak & Kohen, 2007). Value-added implementation in the forest industry has proved challenging, however, as many businesses have struggled to find the resources and capital necessary to finance expansion, do market research, and adequately train workers (DeLong et al., 2007).

A recent update of research results revealed that, over the past year, sales from Harrop-Procter’s value-added program delivered approximately 200,000 dollars in revenue to HPCF. For a forest with such a small AAC, this return is significant, and demonstrates genuine progress towards a more secure financial position for the community forest. This update also confirmed that HPCF made a small operating profit in each of 2007, 2008, and 2009 fiscal years. For this reason, I awarded HPCF a score of *partially met* for the objective of achieving and maintaining financial stability.

Factors that Inhibit Objective Achievement

High cost of careful forestry

Respondents widely agreed that Harrop-Procter's commitment to ecosystem-based forestry, while facilitating the achievement of its source water protection mandate, hinders the ability of the community forest to remain financially viable. With steep drainages, several forest health issues, and numerous source watersheds, implementing ecosystem-based management on the HPCF land base is even more costly than it would be in more forgiving environments. One forest staff member stated that harvests from the community forest produce four low-value cubic metres of wood for each high-value cubic metre. For a community forest with an annual allowable cut of just over 2000 cubic metres, such a low availability of high value timber creates few opportunities to achieve economies of scale, a factor that Ambus (2008) recognizes as key to determining financial competitiveness in the forest industry.

Small land base

The size of the community forest land base was identified by forest staff and some board members as another significant barrier to the long-term viability of HPCF. Gunter (2000) confirms that this is a problem for many community forests. A larger land base would allow for a larger annual allowable cut, and would also allow the community forest to avoid harvest in drinking watersheds except when absolutely necessary to maintain forest health. Anderson and Horter (2000) discuss their related concern that community forests are often 'ghettoized', being forced to operate only in socially contentious areas, without

more unconstrained or productive forests to augment available economic opportunities.

Forest economy controlled by larger companies

Not surprisingly, many community forests across the province are finding it difficult to compete in a forest economy that, for many years, has been dominated by large industrial logging companies (Anderson and Horter, 2002). HPCF is no exception. While the forest economy in the Kootenay region is not as heavily controlled by major interests as other areas, most other tenure holders in the region still have higher AACs and adhere to a forest management approach that is less expensive to implement. Consequently, the prices HPCF is able to attain for its logs or wood products do not allow for significant profits.

No payments for ecosystem services

Further exacerbating the problems associated with the forest economy is the lack of economic return available for the value of ecosystem services provided by forests, an issue recognized by HPCF staff in interviews. The 2006 Community Forest Program Review (Meyers Norris Penney LLP & Enfor Consultants Ltd., 2006) acknowledged that several community forests were managing for values, such as water or recreation, that had worth for BC residents, yet did not produce any economic return for the organization.

Factors that Facilitate Objective Achievement

Beneficial tenure arrangements

HPCF staff and board members pointed to the CFA's tabular stumpage rate[9] as a major factor that enabled financial viability. Tabular stumpage is widely recognized amongst community forests as a policy that has been instrumental in levelling the economic playing field between community forests and larger licensees. Because tabular rates negate the need to participate in the provincial timber appraisal system, community forests are also exempted from the requirement to perform timber cruises, which further reduces operational costs.

Community support

Interview results indicate that community and board members have been extremely generous with their time and commitment to the community forest. Some community members even invested their own funds in the community forest during its early stages, in order to demonstrate the access to financial capital that was required to secure other sources of funding. HPCF staff have also helped the community forest through financial hard times, often working without pay or under the assumption that they would be paid at a later date.

Economic rewards for commitment to sustainable forestry

Some funding opportunities are only available to forest operations that demonstrate a commitment to sustainable forest management. Staff indicated that HPCF's FSC certification and cooperative governance structure have helped the community forest to secure grants or loans that would have been otherwise

[9] Tabular stumpage rates were negotiated in 2006, in part by community forest representatives. They require CFA holders in interior regions of BC to pay only fifteen percent of the average district stumpage rate for other tenures. CFA holders on the coast pay thirty percent of the same rate (Ambus, 2008).

inaccessible. These funding sources have been instrumental in helping the community forest to survive past the expensive first stages of operating a logging company. FSC certification has also helped to keep certain wood markets open to the community forest when they would have otherwise been inaccessible.

5.2.1.4 Objective #4: Fulfil Legal Requirements in order to Maintain Authority over the Watershed

Results from official audits indicated that Harrop-Procter's fulfilment of its tenure requirements has been exemplary. In interviews, Ministry of Forests and Range personnel did not describe any failures by HPCF to meet environmental management, planning, or payment requirements. One HPCF staff member described the reason for the community forest's high level of regulatory compliance by stating, "we're so far beyond what regulations there are in BC that we never ever have a problem. Like the Forest Practices Board came here, we didn't have one infraction. And they said that rarely happens and because we're not doing that much and everything we do is so precautionary that there's just not going to be the same issues" (Interview 1-3). A review of Compliance and Enforcement reports since 2003 revealed no enforceable contraventions under the Forest Act or Forest and Range Practices Act (MOF, 2004; MOFR, 2005b; MOFR, 2006; MOFR, 2007c; MOFR, 2008b; MOFR, 2009). For these reasons, I awarded HPCF a score of *met* for the objective of fulfilling the legal requirements associated with BC's timber tenure system.

Factors that Inhibit Objective Achievement

Detrimental tenure arrangements

HPCF has been highly successful in meeting its legal obligations; however the community forest has had to work very hard to do so, in some cases at the expense of the achievement of alternative objectives. As discussed by forest staff and board members in interviews, HPCF's most significant barrier to meeting its tenure obligations is simply the fact that the obligations are unrealistic for community-based organizations with forest management goals that do not centre on timber extraction. These respondents identified administrative requirements, especially, as time consuming, expensive, and inappropriate for a licensee with such a small AAC. MOFR staff that we spoke with shared the view that there are aspects of BC's current timber legislation and policies that are inappropriate for community forests. More than one Ministry representative that we spoke to stated their belief that there is a need for a new regulation that addresses the unique position of community forests as medium-sized tenures that often operate with small budgets and minimal staff.

Factors that Facilitate Objective Achievement

Flexibility of tenure and MOFR staff

Though there are certainly aspects of the provincial tenure system that are recognized by community forests as problematic, the Community Forest Agreement (CFA) and the government representatives administering it have proven to be flexible enough that HPCF has been able to successfully achieve their objectives within the legal bounds of their tenure. Specific instances that were pointed to by respondents as evidence of this finding were the MOFR's

willingness to extend deadlines for the submission of forest planning documents, the opportunity to negotiate a lower AAC, and the acceleration of the process to grant HPCF long-term tenure.

5.2.2 Community-Specific Objectives

As an organization that recognizes its primary function as manager of source watersheds, HPCF understandably lists several goals and strategies related to water management in its official forest planning documents. Community members also discussed a relatively cohesive set of informal objectives for the management of their drinking watersheds in interviews. Most of the published and discussed objectives were in line with the common objective, *engage in forest practices that promote source water protection*, as they most often related to maintaining watershed conditions, engaging in monitoring activities, and managing the forest in a manner that reduces the risk of pest outbreak or wildfire. Interview results identified one additional community-specific objective, however, which was distinct from the common objectives evaluated above. Most Harrop-Procter residents agreed that drinking watersheds should be protected, but that they should also be accessible for recreational use by the public and for harvest of a diversity of forest resources, including firewood, berries, and other non-timber forest products. I evaluate HPCF's achievement of this additional, community-specific management objective below.

5.2.2.1 Objective #1: Manage Watersheds in a Manner that Allows for Source Water Protection while Simultaneously Allowing for the Use or Harvest of Multiple Forest Resources

All results suggest that this objective has been fully *met* by HPCF. In interviews, forest staff and board members recognized the importance of crown land and resource access to local residents. Many engage in recreation or berry picking on the community forest themselves. HPCF has not attempted to restrict public access to the community forest, nor did respondents discuss the possibility for future implementation of such a policy.

Factors that Inhibit Objective Achievement

The research results identified no factors that inhibited achievement of this objective.

Factors that Facilitate Objective Achievement

Community involvement in decisions

In Harrop-Procter, a governance structure that promotes full community involvement contributes to the accessibility of crown lands and resources. As discussed by board representatives, members of the community forest's decision-making body hold this objective as one of their own, and thus ensure its implementation.

5.2.3 Summary of Scores

Table 4: Evaluation scores for the Harrop-Procter Community Forest

Objective	Score
Engage in forest planning and practices that promote source water protection	Partially Met
Adopt effective governance arrangements, including sound decision making structures and stakeholder engagement strategies	Met
Achieve financial stability and maintain funding for water management initiatives	Partially Met
Fulfil legal requirements in order to maintain authority over watershed	Met
Manage watersheds in a manner that allows for source water protection while simultaneously allowing for the use or harvest of multiple forest resources	Met

6: CASE TWO: MCBRIDE COMMUNITY FOREST

6.1 History and Local Motivations for Source Water Protection

McBride, and the Robson Valley more generally, have been deeply involved in BC's forest economy for many decades. As described in MCF's original proposal for a community forest, the Village has been subject to the booms and busts of the logging industry, and has, for many years, recognized the resulting need to encourage a more stable local economy (MCF, n.d.). When the BC government introduced the Community Forest Pilot Project, local residents saw community forestry as a way to capitalize on the area's rich forest resources, yet maintain accountability and a commitment to the well-being of the community and its residents (MCF, n.d.).

The McBride and District Community Forest Corporation, the entity that prepared MCF's proposal, originally imagined the community forest as a route through which to develop a strong forest-products industry that utilized the diverse array of goods available to be harvested. As such, supporters of the McBride Community Forest saw the pilot project as a way to gain access to the resources needed to support a more diverse economy, and as a way to guarantee a certain amount of employment for the many foresters, loggers, sawyers, and other people involved with forestry in the valley (MCF, n.d.). It was on these grounds that the MOFR awarded a Community Forest Pilot Agreement to McBride in 2002.

Due to the expressed desires of both McBride and the Ministry of Forests, the land base specified in the pilot agreement included Dominion Creek, the watershed from which the Village of McBride draws its drinking water. Dominion Creek is the only community watershed, as designated under FRPA, that is managed by MCF; however, several additional domestic watersheds also lie within the community forest land base, and the users that rely on these watersheds do not benefit from the level of treatment and filtration that McBride village residents enjoy. McBride's official forest planning documents recognize both Dominion Creek and the domestic watersheds as important forest resources (MCFC, 2003; MCFC, 2007a). As discussed above, however, protection of these watersheds was not the primary impetus for the community forest. Research results also indicated that considerations surrounding source water protection do not take precedence over timber harvest activities on a day-to-day basis. I will further discuss this finding in the sections below.

When we asked residents what they value about living in McBride, many listed clean, drinkable water as an important factor. Some also recognized water management as a potential benefit that MCF can provide to the community. In interviews, for the most part, local people recognized the risks that logging poses to water quality and quantity, though they also acknowledged the potential for forestry to be conducted safely in a watershed. Many also spoke of the opportunity for forestry, especially careful, community-controlled forestry, to actually improve watershed conditions through debris removal and fire or pest outbreak mitigation efforts. As one resident stated, "my personal opinion is that

you have to deal with it from a forest health perspective. Go in there, keep it clean, keep a whole bunch of garbage out of people's domestic water. You know, trees fall in it, smash things, you don't want to leave a bunch of dead wood standing around that's going to go smashing their intakes and making a mess" (Interview 2-3).

Source water protection is certainly one of the most prominent environmental issues in the Robson Valley. Respondents suggested that, despite the area's traditional reliance on resource exploitation for economic development, a 'greener' mentality has been developing amongst the younger McBride residents for some time. Several community residents supported a historic moratorium on logging in the area now controlled by the community forest. An interviewee who is also a local resident led the political push for the moratorium, which was implemented due to concerns over certain forest practices that posed a risk to source water quality. The campaign was successful and prevented logging in the area around town through most of the 1990s. Other residents spoke of their concern over logging-related water problems in nearby communities. Evidently, even if the community forest does not overtly discuss source water protection as a primary concern, the level of community interest in water issues ensures that effective water management is at least an important consideration for MCF.

6.2 Evaluation and Discussion

6.2.1 Common Objectives

6.2.1.1 Objective #1: Engage in Forest Planning and Practices that Promote Source Water Protection

As with the Harrop-Procter community forest, interview results suggest that McBride and area residents have experienced no significant issues with source water quality, quantity, and timing of flow since the inception of the community forest. No resident spoke of source water problems that they considered to be linked to forest operations by MCF. Public water notices for the Village of McBride confirm that the lowest level of risk exists for problems with the community water system. Some domestic water users in the area have been on boil water advisories for several years; however, the notices list inadequate treatment levels, as opposed to source water contamination, as the reason for issuance (Northern Health Authority, 2010).

MCF has developed an informal partnership with the water system operator for the Village of McBride in order to ensure that any problems with water quality are reported to the community forest. Respondents did not discuss any monitoring initiatives in the many domestic watersheds that serve residents in the 'footprint' area of the community forest—the rural area outside the Village of McBride that is still within MCF's land base.

Though MCF's record with source water problems provides evidence that the community forest has maintained favourable source watershed conditions, interview results indicate that some community members *have* in the past come

forward with concerns over MCF's forest practices and planning approaches in drinking watersheds. In one case, a community member noticed logging activities nearby and did not receive clear identification from the logging contractor regarding how close harvest activities would come to their water intake. The issue was resolved when the forest manager spoke to the logging contractor and identified a clear boundary for timber extraction. Another concern, which a community member eventually submitted to the Forest Practices Board, related to the building and use of an unpermitted road close to a domestic water intake. Community forest staff stated in interviews, and in the Forest Practices Board audit, that they were not responsible for building the road, nor did they authorize its existence. This defence was accepted by the Forest Practices Board (FPB, 2008).

McBride's forest practices in the watershed that serves the Village appear to generally fit within standard protocols for forestry in source watersheds. Forest staff stated that MCF tries to avoid any harvest in the Dominion Creek watershed whatsoever, having only contracted one small special forest products harvest in the area. A contractor completed this harvest with all-terrain vehicles, which negated the need for any road building in the community watershed. MCF's updated management plan also describes the community forest's involvement in a project that removed debris from the area surrounding the Dominion Creek water intake (MCFC, 2007a). Contract loggers generally discussed implementing forest practices in domestic watersheds that fit with standard regulations—for example, leaving wider-than-typical riparian buffers, taking extra care to avoid

spills of toxic substances when refuelling machinery, and logging sensitive areas during the winter season, when the frozen ground prevents many problems with soil disturbance.

Most residents of the Village of McBride that we spoke to expressed confidence in the community forest's ability to effectively manage their drinking water, but some residents of the 'footprint' area did not exhibit the same sense of security. Multiple interviewees discussed their opinion that MCF applies management standards in the community watershed that are not utilized elsewhere, suggesting that the heavy involvement of the mayor of McBride in the governance of the community forest ensures that the village's water system receives exceptional levels of protection. Though these interviewees identified few examples of specific substandard forest practices, they highlighted problematic aspects, described below, of the community forest's approach to forest planning in domestic watersheds.

Since at least 2008, most harvest activities in the community forest have occurred under a large cutting permit for special forest products and intermediate cutting. Such a permit is intended for what the MOFR has termed "pick and poke" harvesting—removal of individual trees for stand thinning or special wood products such as shakes and shingles (figure 3). In interviews, several community members noted that the widespread use of this permit, for the reasons discussed below, has resulted in limited site planning within the community forest over the last two years.

Figure 3: "Pick and poke" harvesting for special forest products in the McBride Community Forest

According to the requirements of the *Forest and Range Practices Act*, (S.B.C. 2002, c. 69), small harvests under this type of permit are not required to have an associated site plan. Usually, site plans formally identify the area that will be harvested, set allowable site disturbance levels, and describe how the licensee will meet provincial environmental management expectations. In interviews, some 'footprint' residents shared their concern that, without this important level of planning, MCF is not adequately meeting its responsibilities with regard to providing guidance to contract loggers, and to maintaining a reliable record of activities on the timber harvesting land base. This is especially worrisome for domestic water users, who understandably see drinking

watersheds as sensitive areas that require higher levels of formalized planning and protection.

Some respondents involved in the forest industry also discussed their concern that many of the contract loggers employed by MCF are not completely familiar with the set of provincial regulations that govern forest practices. According to these interviewees, this shortcoming, combined with the lack of formal input and planning on the part of community forest management, has created a dangerous situation where logging activities in and around watersheds may be carried out by improperly informed loggers with inadequate supervision. As one concerned logger put it, the community forest management staff “kind of let you do your own thing” (Interview 2-9). There were some suggestions from a knowledgeable community member that, in response to this problem, MCF has recently begun to require its contract loggers to develop an informal site plan before commencing harvest. These site plans, although not publicly available, purportedly require loggers to identify harvest and reserve areas, map out skid trails, and distinguish riparian buffers.

With regard to planning forest activities in order to remove water quality threats from wildfire and pests, MCF’s response has been commensurate with the historically low wildfire risk associated with the ecological conditions in the area. McBride also benefits from low levels of pest infestation, as compared to other case studies in this report. MCF’s management plan specifically lists, as one of their objectives regarding water quality, the need to “protect watersheds from catastrophic events which could produce poor quality water” (MCFC, 2003,

4) and, in 2004, the community forest focused the majority of its harvest activties on removing trees killed by mountain pine beetle. Forest staff, however, did not discuss any more recent initiatives to address fire risk or pest infestations.

The McBride Community Forest has therefore been successful at managing source water, without having fully implemented the planning processes typically considered to be important to guarantee high levels of protection. For this reason, I awarded MCF a score of *partially met* for this objective.

Factors that Inhibit Objective Achievement

Lack of access to specialized knowledge

Research results demonstrated that access by MCF to the specialized skills or knowledge that may be necessary to protect source watershed conditions under a timber tenure is insufficient within the governance structure of MCF. While the forest manager is a Registered Professional Forester, respondents did not discuss any formalized relationships with hydrologists or ecosystem-based forestry experts. Regular engagement with experts in these fields could help improve the level of understanding surrounding modern or ecosystem-based forest practices amongst community forest contractors, board members, or the community as a whole.

Insufficient commitment to formalized decision-making and planning

It was clear that a lack of commitment to formalized decision making and planning affects the potential for MCF's source water protection strategies to have lasting impacts. The production, in recent years, of only a few formal site plans indicates that some harvests within the community forest have been

completed without thorough advance planning. This problem also lessens the community forest's accountability to water users, as it limits the publicly available record of logging activities. MCF has not developed a set of Standard Operating Procedures for forest activities in drinking watersheds, though such standard procedures are often utilized by major licensees in BC, and the importance of doing so is recognized in the forest's original management plan (MCFC, 2003).

Factors that Facilitate Objective Achievement

Involvement of water users on board

The involvement of McBride water users within the governance structure of the forest helps to ensure that only minimal logging occurs in the source watershed that serves the Village of McBride.

6.2.1.2 Objective #2: Adopt Effective Governance Arrangements, Including Sound Decision Making Structures and Stakeholder Engagement Strategies

The McBride Community Forest is operated by McBride Community Forest Corporation (MCFC), which is wholly owned by the Village of McBride. MCFC has a seven-member board of directors, populated by three councillors from the village, one administrator from the village, and three members at large. The members at large must be people who live outside the Village of McBride, but within the 'footprint' of the community forest.

MCFC has two staff members—one forest manager and one field operations coordinator. The community forest does all logging through contracts.

The nature of McBride's governance structure ensures that MCF is not wholly representative of the community. Three of the seven board members are

local politicians, and up until very recently, these politicians appointed the three remaining board members. Interviewees suggested that in the past, there has been significant criticism from the footprint communities about their lack of representation on the board of the community forest. Several respondents mentioned their concern that the village council had captured the board and that the community forest distributed its earnings accordingly. In response to this criticism, board members have recently implemented a policy where members at large are now elected at the community forest's annual general meeting. At the time of my research, this policy was very new, and, therefore, I cannot evaluate its effectiveness here. MCF also has a conflict of interest policy that requires McBride residents who want to sit on the community forest's board of directors to openly disclose their involvement in the local forest industry before joining the board. While MCF implemented this policy in order to allow local contractors to participate in the governance of the community forest, interview results suggested that loggers, tree planters, and wood products manufacturers are still reluctant to join the board out of fear that their involvement could be seen by the wider community as a conflict of interest. Accordingly, as discussed by several respondents, little knowledge of logging or the forest industry is present within the governance structure of the community forest.

Mechanisms to maintain accountability to the community include two public general meetings per year, a website, and an open-door policy at the community forest office. Forest staff produced a newsletter in the early years of the community forest with the intention of keeping residents informed about MCF

activities, but it was discontinued in recent years because, as discussed in interviews, forest staff thought it encouraged an unreasonable level of criticism from the local population. Board members said that forest staff make most day-to-day forest management decisions, without significant input from the wider community. As a result, decisions are evidently not approved by a representative sample of McBride residents, and therefore do not necessarily serve all community interests.

Some of the conflict surrounding MCF seems to be related to an unreasonable set of expectations among local residents regarding the community forest and what it might achieve. Discussions with representatives of several community interests revealed two conflicting opinions regarding MCF's role in the local economy. Some thought that the community forest had a responsibility to keep loggers and wood processors working by allowing access to harvestable timber. Others thought that the community forest should be focusing on distributing benefits to the community as a whole, and that it was not the responsibility of MCF to support otherwise unviable local businesses.

Accordingly, and as discussed in interviews with respondents not involved in community forest governance, local residents do not necessarily approve of the outcomes of community forest management. The McBride area population does not hold the same homogeneous, or nearly homogeneous, set of objectives for forest management that may be present in smaller isolated communities like Harrop-Procter. Some residents said that they are perfectly happy with MCF operations, while others think the community forest should pay more attention to

environmental concerns, the financial well-being of the local wood products industry, or equitable representation on the board of directors.

Research results suggested that the community forest's willingness or ability to adapt to these concerns has been somewhat lacking. Except for the change in board member representation, the institutional arrangements of MCF have remained relatively static over the course of the community forest's existence.

Interview results revealed that the leadership of the community forest has been frequently criticized by community residents, but it is clear that much of this criticism is unwarranted and brought on by personal grudges or small-town politics. Some respondents felt that the forest manager was inaccessible to the local population, while others felt intimidated by the staff's level of education or employment experience in high-level positions with the MOFR. Despite these criticisms, it was clear that the forest manager had developed a set of relationships, and achieved a series of successes, that have greatly benefitted the day-to-day operations of the community forest. Due in part to his status as a former forest-district manager, he has developed strong working relationships and good communication with MOFR personnel that make it easier for the community forest to efficiently meet legislated expectations. In addition, as a member of the BCCFA board of directors, the forest manager has been instrumental in negotiating tenure arrangements, including a stumpage rate for CFAs in BC that is far below that for other types of tenures, that have greatly benefitted the financial position of all community forests.

As a Registered Professional Forester, the forest manager is also the major source of information on forest practices for the community forest. For the most part, staff and board members agreed that they had access to most of the information they see as necessary to manage the land base. The only significant information gap identified by respondents concerned the accessibility of a complete and up-to-date map of domestic water intakes within the community forest. MCF does have a map of officially licensed water intakes associated with its Forest Stewardship Plan, but some respondents felt that this map does not effectively capture the exact locations of intakes or illustrate the location of unlicensed source watersheds.

MCFC, as a corporation, has not had to develop the type of official decision making protocols that the Harrop-Procter Community Cooperative has implemented. Interviews and official forest documents revealed that MCF generally made decisions on an ad-hoc basis. For example, several interviewees discussed the community forest's timber-allocation process as usually involving a contract logger approaching a staff member with a potential harvest site in mind, and asking the staff member for approval. As one respondent said, "they (a contract logger) would say 'I got a site up there, up by wherever, and I want to go and cut some trees'... So buddy (the contract logger) would just draw a little map, draw a little thing like that, buddy (a forest staff member) would sign it, and off he'd go" (Interview 2-2). It appeared that this approach has been somewhat improved in recent years, by requiring the contractor to submit an informal site plan; however, basing the location of cut blocks on requests from contract

loggers, instead of a holistic, long-term harvest plan for the community forest, limits the level of organization and foresight displayed by MCF. It was apparent that a more defined approach to decision making and forest planning would improve the accountability and transparency of the community forest.

The commitment to education and training exhibited by the community forest reflects some of the problems MCF has had with accessing highly trained loggers who are familiar with provincial forest regulations. As discussed by forest staff and board members, concerns over a deficiency in local knowledge of basic forestry principles forced the community forest to host a series of workshops for its contract loggers in recent years. Forest staff and local forestry experts hosted the workshops, which were designed to improve the attendees' understanding of subjects such as forest succession and site disturbance. Notably, no workshop specifically addressed best practices for logging in drinking watersheds. In the wider community, MCF participates in a program with local schools that involves hosting a tree planting event in the community forest for young children. The program helps spread awareness about the community forest and forestry in general among the children of McBride.

Representatives of the community forest did not describe any strong commitment to learning. Some board members spoke of their interest in knowing more about the principles of forestry; however, forest staff and contract loggers did not express the same desires in their interviews.

In interviews, community forest staff and board members expressed mixed opinions on the ability of the present governance arrangements to allow for

effective management of the land base. Respondents discussed the problem of board-level representation of footprint communities often, but they also considered the new election policy to have solved the problem. Some board members, though not all, recognized that there were persistent problems with incorporating more environmentally-focused community interests into decision making. No current board members discussed or recognized the problems with accountability that are inherent in McBride's decision-making processes.

As discussed above, there is a high level of conflict originating from local residents concerning the governance structures and management decisions of the McBride Community Forest. The conflict primarily originates from community members who reside outside of the Village of McBride. Though some of the conflict has been beneficial, as it has led to improvements in the structure of the board, or to investing resources to educate contract loggers, not all disagreements, including personal attacks on the forest manager, have been constructive. The level of conflict has elevated to the point where the forest manager said that he now spends the vast majority of his time dealing with political matters, instead of focusing on actual forest management issues.

It was apparent that low levels of public engagement reflect and also contribute to the high level of conflict surrounding the community forest. Several respondents spoke of poor attendance at general meetings, in addition to a generally low level of interest in the community forest across the population of the McBride area. Some residents said that they attributed the minimal level of public engagement to a common perception that there would be very little opportunity to

make any difference in how the community forest operates, given the dominance of certain community interests on the board of directors. Other respondents simply discussed the fact that local residents were too busy with their families, jobs, or other civic engagements to commit more time to another community organization.

As demonstrated, the McBride Community Forest adheres to a set of governance arrangements that are significantly out of step with general expectations for community-based organizations that serve the common interest. For this reason, I awarded MCF a score of *not met* for this objective.

Factors that Inhibit Objective Achievement

Inadequate community representation

Capture of MCF by the village council has, at least allegedly, compromised the community forest's commitment to domestic watershed management for residents that live outside of the village itself. In addition, a common opinion exists amongst local people actively involved in the forest industry that there would be an insurmountable conflict of interest if they were involved on the board of directors. This discourages community representatives with operational forestry knowledge from joining the board, contributing their knowledge, and sharing their perspectives.

Polarized nature of community

It was apparent that the McBride community forest does not benefit from the support of the type of engaged and cohesive population that is present in Harrop-Procter. Respondents discussed a certain polarization of the McBride

population—between the more conservative and more progressive residents—that affects the expectations placed on the community forest, and the willingness of people to work collaboratively. Accordingly, as discussed by forest staff, very few people, other than those who have a complaint to make, attend general meetings or participate in decision-making processes.

Low levels of concern regarding source water protection

McBride residents, especially villagers, also lacked the sense of concern over the quality of their source water that was present in Harrop-Procter. Most likely because of the presence of McBride's municipal water system, which removes most immediate threats posed by source water contamination, village residents did not express any significant level of concern regarding potential logging activities in their watershed. A historically low level of risk associated with wildfire and pest outbreaks in the region seemingly also contributes to the low level of local concern about source water protection. Not surprisingly, then, source water management issues have not been prioritized by the community forest.

Factors that Facilitate Objective Achievement

Knowledgeable forest manager

It was clear that the community forest greatly benefits from a forest manager who is familiar with the policies of the MOFR. This person's knowledge has allowed MCF to identify ways to work within the legislation that permit the community forest to engage in legal forest management that does not require the level of administration that other community forests face. We also saw that the

forest manager's professional connections allow MCF good access to influential MOFR personnel.

Resource-dependent nature of community

McBride is, and has historically been, a resource dependent community, with about ten percent of the labour force obtaining direct employment from resource industries (Statistics Canada, 2010). As interviewees discussed, dozens of families continue to look to forest licensees, including the community forest, to sustain their livelihoods. It thus follows that there would be a strong motivation amongst community residents to see MCF succeed. Gunter (2000) recognizes dependence on the forest resource as a key factor in enabling the successful operation of a community forest.

6.2.1.3 Objective #3: Achieve Financial Stability and Maintain Funding for Water Management Initiatives

McBride Community Forest board members and staff recognized MCF's role as a primary economic driver in the community. Correspondingly, the community forest has continued to engage in harvest activities throughout the recent downturn in the forest products sector. Not all community forests have pursued this strategy—others have elected to put off harvests until the forest economy rebounds and the potential returns to make significant profits. McBride's persistence, however, has ensured that a number of local loggers have remained employed, and that the community forest has continued to generate revenue over the last few years.

Annual reports and discussions with community forest staff indicated that MCF has remained in a positive financial position for several years (MCFC, 2007b). Consequently, the community forest has been able to fund a variety of community initiatives, including a portion of a recent project to upgrade McBride's water supply system. One strategy that forest staff and board members discussed as a potential opportunity to further improve finances was working with a bioenergy company that has shown interest in building a plant in the area. No significant progress had been made on this project by the time that my research concluded, however, and several community residents shared their scepticism of the feasibility of a local bioenergy plant in interviews. Studies on the practicality of bioenergy in British Columbia generally agree that the concept could become economically feasible when other energy options become more costly; however, the current limited availability of appropriate technology and the comparatively low cost of alternative energy sources negates the potential for profits (Stennes & McBeath, 2006; Stennes, Niquidet & Kooten, 2009). Some experts are also concerned about the ecological impacts associated with the type of large-scale removal of wood waste from the forest ecosystem that is required to feed a bioenergy plant (Lattimore et al., 2009)

Some community members suggested that McBride's favourable financial position might be at risk for the future, as they see the current state of the forest sector as a motive to liquidate valuable forest resources. Current log and lumber prices encourage contractors to target only the most profitable species. A few respondents expressed their concern that MCF's objective to keep loggers

continuously employed will result in problems with the future supply of timber, especially the most valuable species that contractors are pursuing at present. As one logging contractor put it, “don’t get me wrong, they kept it (the local forest economy) going when it would have been flat. But you know, look at the other side of it—at what cost? You know, because they’ve been selling off some of the prime wood at bargain prices and, you know, five years from now, the price of wood could be five times what it is right now” (Interview 2-9). Nevertheless, it is difficult, in some ways, for the present study to predict the financial future of MCF, given the many factors that could influence the future viability of any forest enterprise. It is only possible to make judgements based on past experience and, for that reason, I awarded McBride a score of *met* for the objective of maintaining financial viability.

Factors that Inhibit Objective Achievement

Low level of economic diversification

The McBride region suffers from low levels of economic diversification (MCF, n.d.). Contract loggers stated that they have few alternative options for employment when work is not available from the community forest or other nearby licensees. Thus, there is evidently public pressure on the community forest to engage in logging activities even when market conditions dictate that all or most logging should cease, as they have in other community forests. For example, the Likely-Xat’sull community forest has made the decision not to log for the past two years, electing to wait for more favourable log markets and the opportunity to gain a higher profit for their wood. Many Likely residents, however,

have been able to secure alternative employment in the mining industry, which is booming in the Cariboo region of BC.

Detrimental tenure arrangements

In interviews, MOFR staff in McBride, as in Harrop-Procter, recognized that the current suite of legislation occasionally affects the economic viability of small tenures. These respondents spoke of a need for a system that can formalize the type of 'pick and poke' harvesting done by the community forest. Some interviewees in McBride and elsewhere suggested that allowing community forests to apply for one cutting permit that covers their entire land base would be greatly beneficial. The current system requires all forest licensees to acquire a separate cutting permit for each individual harvest activity. Cutting permits take time to apply for and have approved, and can thus hinder a community forest's ability to quickly respond to fluctuations in market demand for any one forest product. The MOFR is making progress toward implementing a 'one cutting permit' policy. The system is currently being tested in woodlots, and MOFR staff said they expected it to expand to community forests in the coming years.

Factors that Facilitate Objective Achievement

Beneficial tenure arrangements

Forest staff and contract loggers in McBride expressed appreciation for the same aspects of the community forest tenure that Harrop-Procter residents discussed as economically beneficial, including tabular stumpage rates and no minimum mandatory harvest. As discussed above, opportunities provided by a

cutting permit for special forest products and intermediate harvests have also greatly benefitted the efficiency and financial viability of the community forest by allowing it to target certain types of wood, and by reducing the requirements for expensive administrative processes. It is important to note, however, that this permit has also clearly promoted a low level of forest planning within MCF.

6.2.1.4 Objective #4: Fulfil Legal Requirements in order to Maintain Authority Over Watershed

Interview results from forest staff and Ministry personnel indicate that the McBride Community Forest has fulfilled all of its environmental management and planning requirements as a timber tenure holder. Though the lack of site plans prepared by the community forest was a concern to local residents, it is a permissible strategy, as MCF is adhering to the requirements of the type of permit it has been operating under.

MOFR Compliance and Enforcement has not issued any enforcement actions to MCF (MOF, 2004; MOFR, 2005b; MOFR, 2006; MOFR, 2007c; MOFR, 2008b; MOFR, 2009). In 2008, a series of complaints to the Forest Practices Board from four community residents incited an official investigation of the McBride Community Forest. The complaints included allegations that MCF contractors damaged existing roads, that they built an unauthorized road near a water intake, that they inappropriately located slash piles, and that they failed to notify a trapper when logging near a trap line. The results of the investigation revealed that one complaint was substantiated, others were unsubstantiated, and still others were best looked into by the Compliance and Enforcement Branch of

the MOFR. The report also discusses some minor contraventions of the legislation by MCF (FPB, 2008).

Because of these complaints and the results of the Forest Practices Board investigation, I awarded MCF a score of *partially met* for the objective of fulfilling the legal requirements associated with a timber tenure.

Factors that Inhibit Objective Achievement

Lack of formalized decision making

A lack of formalized decision-making processes affects the ability of MCF to remain accountable to local residents. In interviews, it became clear that this lack of accountability led to a community member filing the Forest Practices Board complaint. The results of the investigation also discussed the need for MCF to improve its record keeping and commitment to public consultation.

Factors that Facilitate Objective Achievement

Opportunities for self-regulation

Research results showed that few Compliance and Enforcement evaluations had taken place within MCF over the last several years, and, as discussed by forest staff, the community forest had essentially become self-regulating. Self-regulation allowed MCF to operate efficiently. Yet, the concerns several community members discussed regarding the relatively low level of knowledge amongst contract loggers regarding acceptable forest practices suggests that a higher degree of scrutiny would help ensure stewardship of the landscape.

6.2.2 Community-Specific Objectives

McBride's official forest planning documents, as would be expected, do not discuss source water protection to the same degree as Harrop-Procter's. In addition, the residents of McBride did not discuss a cohesive set of expectations for management of their drinking watersheds in interviews. Accordingly, research results identified only two community-specific objectives for MCF. McBride's Management Plan, which was first written in 2003 and then updated in 2007, provided one of these objectives. The section that discusses management approaches for water resources states that MCF will endeavour to "increase the current level of domestic water management" within the community forest (MCFC 2003, 4). The plan provides a list of strategies that helps to clarify the meaning of the objective. The strategies include developing a plan to monitor the effects of forest activities on domestic water, generating an inventory of domestic water intakes in order to identify unlicensed source watersheds, and encouraging the formation of water user groups that represent regional collections of domestic water users. Forest staff confirmed the importance of this objective in interviews, as they felt that the existence of domestic water usage was more extensive than would be apparent from a listing of legally licensed surface intakes.

Interview results identified a second community-specific objective. Most McBride residents, similar to those of Harrop and Procter, agreed that they would only support source water protection efforts that still allowed for other uses of the local forested land base, including harvest of non-timber forest products and wilderness recreation.

6.2.2.1 Objective #1: Improve Domestic Water Management

McBride's updated Management Plan, and discussions with forest staff, indicated that this objective has been largely *not met* by the community forest (MCFC, 2007a). Though MCF originally hoped to develop a monitoring strategy for domestic watershed conditions, the community forest had not done this as of the summer of 2009. An improved inventory of domestic water intakes within the community forest land base, the importance of which is discussed above, has also not been completed. Legally, such an undertaking would be the responsibility of the BC Ministry of Environment; however there were no indications that MCF had attempted to work with the Ministry in order to encourage advancement of the project. In the 2003 Management Plan, McBride stated its intention to encourage the formation of domestic water users groups in order to facilitate more effective communication between the community forest and water users. MCF has not followed this intent, and effectively dismissed it in the updated 2007 Management Plan for not having "been an issue at public meetings" (MCFC, 2007a, 4).

Factors that Inhibit Objective Achievement

Prioritization of other values

MCF has evidently failed to achieve this objective primarily because it has not prioritized domestic water management issues for several years. Other objectives, including keeping local loggers employed, and contributing to community development projects, have consumed all available financial and human resources. The reasons for MCF's lack of commitment to domestic water management seems to primarily be attributable to the nature of the McBride

community, which, itself, has not advocated for improved source water protection strategies.

Factors that Facilitate Objective Achievement

Research results identified no factors that facilitate the community forest's achievement of this objective.

6.2.2.2 Objective #2: Manage Watersheds in a Manner that Allows for Source Water Protection while Simultaneously Allowing for the Use or Harvest of Multiple Forest Resources

All results indicate that MCF has *met* this objective. In interviews, forest staff recognized the value that community members place on the ability to use and gather a variety of forest resources from the areas that surround town. The community forest has not made any efforts to restrict access to drinking watersheds. The licensing of non-timber forest products by MCF, an option available under the provisions of the Community Forest Agreement, has also not been pursued. Respondents generally agreed that community members would resist the restrictions that such a licensing system would place on free and unencumbered use of the forest for traditional harvesting and recreational activities.

Factors that Inhibit Objective Achievement

Research results identified no factors that inhibit the community forest's achievement of this objective

Factors that Facilitate Objective Achievement

Involvement of community members on board

As in Harrop-Procter, involvement of recreationalists and users of non-timber forest products on the board of the community forest helped to ensure that access to crown land and resources remained open to all McBride residents.

6.2.3 Summary of Scores

Table 5: Evaluation scores for the McBride Community Forest

Objective	Score
Engage in forest planning and practices that promote source water protection	Partially Met
Adopt effective governance arrangements, including sound decision making structures and stakeholder engagement strategies	Not Met
Achieve financial stability and maintain funding for water management initiatives	Met
Fulfil legal requirements in order to maintain authority over watershed	Partially Met
Improve domestic water management	Not Met
Manage watersheds in a manner that allows for source water protection while simultaneously allowing for the use or harvest of multiple forest resources	Met

7: CASE THREE: CRESTON COMMUNITY FOREST

7.1 History and Local Motivations for Source Water Protection

Creston's experiment with community forestry began in 1997, when the manager of the Kootenay Lake Forest District announced the availability of a forest license for a community-based organization. In response, a group of stakeholders representing the Town of Creston, the regional district, a local development authority, a neighbouring First Nation, and a prominent Kootenay-based environmental organization assembled and submitted an application. The group was named the Creston Valley Forest Corporation, and it was awarded a non-replaceable forest license in October 1997 (CVFC, n.d.).

The operating area for the new license included Arrow Creek, the surface source that supplies water to the town of Creston and the neighbouring community of Erikson. Industrial forestry had not occurred in the Arrow Creek watershed since the early 1970s—it was a highly contentious area that was the focus of a significant level of local opposition to industrial logging practices. Logging in the Creston area produced such pervasive conflict that, in 1977, the provincial government established, amongst Creston-area residents, the first Public Advisory Committee to the Forest Service. The committee functioned for 24 years to provide advice to the provincial government regarding controversial resource management issues; however, it ultimately failed to appease the portion of the local community that remained wary of conventional logging (CVFC, 2010).

Thus, the main factors that motivated the formation of the community forest were that local residents wanted greater control over their source watershed, and the provincial government wanted the Arrow Creek area to be re-opened to timber extraction.

The Creston Community Forest (CCF) land base adjoins a relatively heavily populated area that includes the Town of Creston and several nearby communities. Accordingly, the community forest manages numerous community watersheds in addition to Arrow Creek (which supplies the Town of Creston). Sullivan, Camp Run, Floyd, Lister, and Russell Creeks all provide water to residents of the communities surrounding Creston. Several domestic watersheds exist in CCF as well (CVFC, 2008). The Town of Creston recently installed a multi-million dollar, state of the art water filtration system, but the communities that are served by the smaller community and domestic watersheds are more directly affected by watershed conditions. Consequently, representatives of the local Improvement Districts, the organizations that oversee the management of drinking watersheds, are very concerned about, and interested in, logging operations in CCF.

The Creston area's economy is highly dependent on clean, plentiful water. The most significant economic activities in the area centre on the fruit agriculture industry, in addition to the Columbia Brewing Company (CVFC, 2008). Locals estimate that the watersheds managed by the community forest provide a value to the Creston community that exceeds 400 million dollars annually (CVFC, 2008). Community forest staff spoke often of the importance of water quality to

their day-to-day operations. The significance of source water protection to CCF is echoed in its planning documents, which acknowledge watershed protection as the main impetus for the community forest, identify water as the most valuable resource available from the forest, and list watershed conditions as a primary operational concern (Silva Forest Foundation, 2003; CVFC, 2008).

The resource-oriented nature of the Creston economy is associated with a population that supports active management of the drinking watersheds. In fact, during a land management planning process in the 1990s, agriculturalists and loggers in Creston actively opposed the formation of a park in the Arrow Creek watershed. Unlike in Harrop-Procter, where many local residents would rather see the forest land left untouched, most respondents in Creston said that they recognize the value of the resources available from the watersheds, and would like to see some of that value transferred to the city and its residents.

Interview results indicated that because the Creston and area community is large and geographically expansive, a smaller percentage of local residents engage with CCF on a regular basis compared to the other community forests we investigated. Of the people that we talked to, however, a large percentage recognized the important role that the community forest plays with regards to watershed protection. These same residents further acknowledged the risks that wildfire poses to their drinking water quality, and therefore supported the community forest in its extensive interface fire management efforts.

7.2 Evaluation and Discussion

7.2.1 Common Objectives

7.2.1.1 Objective #1: Engage in Forest Planning and Practices that Promote Source Water Protection

Similar to the two cases discussed above, water users served by the watersheds managed by the Creston Community Forest identified no problems with source water quality, quantity, or timing of flow that they could attribute to CCF's logging activities. Several provincial water quality notices are in effect for the small communities that surround Creston; however, the details of the notices reveal that they were issued for inadequate levels of treatment, or that they have been in place since before the community forest took over the management of the watershed. The Arrow Creek watershed, which feeds Creston's municipal water system, does not currently have any active water advisories (Interior Health Authority, 2010).

Improvement Districts and the federal government have monitored water quality in the larger community watersheds near Creston, including Arrow Creek, Russell Creek, and Sullivan Creek, for many years (CVFC, 2008). The community forest does not perform these monitoring activities, but the results act as sources of information for forest managers. CCF's management plan states that, in 2002, the community forest installed a water monitoring station at the headwaters of Arrow Creek that the town used to develop a three-year inventory of baseline data on water quality and flow regimes (CVFC, 2008). Interviewees did not discuss any water monitoring programs that the community forest is administering at present.

According to forest staff and board members, the main threats to Creston's source watershed generally originate from pest or wildfire risk—both of which CCF actively manages. Some community forest staff also considered recreational access to source watersheds as a risk to water quality, but, as of the date I completed my research, CCF had taken no genuine steps towards removing this threat. Local residents, especially those who live in the communities outside Creston, spoke often in interviews of their concerns over the perceived threat that logging poses to their watersheds. The resulting conflicts between CCF and local improvement districts have evidently come to dominate the social environment surrounding the community forest in recent years. I will discuss these conflicts at length in the evaluation of the next objective.

Creston's logging policies demonstrate adherence to standard protocols for careful forestry in source watersheds. Similar to the Harrop-Procter Community Forest, Creston takes an ecosystem-based approach to logging that is guided by a landscape-level plan prepared by the Silva Forest Foundation (Silva Forest Foundation, 2003). As forest staff discussed in interviews, CCF consults a hydrological assessment before harvesting any block located in an identified source watershed. While harvest strategies have somewhat shifted in recent years, CCF's initial cut blocks mostly utilized shelterwood or selection[10] silvicultural systems. Accordingly, hand falling or cable-harvesting is often employed, which results in a low level of site disturbance (figure 4). Winter

[10] "A silvicultural system that removes mature timber either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained" (MOFR 2008b, 92)

conditions are also preferred for many harvests, as they allow for minimal site disturbance. More recently, CCF has prescribed some clear cuts with reserves in order to remove large stands of beetle-killed timber.

Figure 4: A cable-logged area in the Creston Community Forest

While CCF has skidded long distances in order to avoid road building in source watersheds, forest staff also recognized that roads provide a means of access to fight fire. Fire protection is a primary concern of the community forest, and informed respondents discussed it as a significant risk to drinking watershed conditions. CCF has logged several blocks with the specific objective of reducing wildfire risk. Correspondingly, in order to install fire breaks around the town and its water source, the community forest has chosen not to replant these areas in a

manner that meets the conventional stocking standards[11] described in provincial regulations. A 2008 audit by the Forest Practices Board highlighted this management strategy as a significant act of non-compliance (FPB, 2009a); however, community forest board members maintain that CCF's approach to wildfire management is sound.

The Creston Community Forest therefore consistently engages in forest planning and practices to protect source water. For this reason, I awarded CCF a score of *met* for this objective.

Factors that Inhibit Objective Achievement

Low level of forestry knowledge on board

In interviews, some respondents cited the limited amount of forestry knowledge present amongst board members as a barrier to effective community forest and source water management. Low levels of resource-specific knowledge are common in community-based organizations, and other authors recognize this as a significant impediment to effective governance (Anderson & Horter, 2002).

Factors that Facilitate Objective Achievement

Low levels of forestry knowledge on board

While some respondents said that the low level of forestry knowledge present on the board hindered the success of the community forest, others said that it promoted the implementation of CCF's non-traditional objectives. Since the board of directors represented a variety of interests and viewpoints, these

[11] A term used to define the legally required density and spacing of healthy trees that are of a desirable species after harvest. Stocking standards can be met by leaving a certain amount of standing timber after harvest, or by replanting the area following more extensive timber removal (MOFR 2008b)

respondents believed that board members were able to share their perspectives without having their opinions skewed by any commonly-accepted theories of forest management.

Strategic relationships

CCF representatives spoke in interviews of several lessons learned regarding the community forest's approach to logging operations. Most prominently, forest staff and board members have developed a firm belief in the value of building strong working relationships between the community forest and contract loggers, in order to ensure on-the-ground implementation of the innovative forestry principles to which CCF subscribes. A former staff member described his approach to relationship building with contract loggers as follows: "you catch more flies with honey than you do with vinegar. And I get these guys trained and they do it right and right away, I give them positive feedback. Give them positive feedback or gently correct them and... They bust their butts for us" (Interview 3-3).

Motivated staff and supportive board members

Interviews with board members indicated that CCF staff have always been highly committed to the principles of ecosystem-based management. From the inception of CCF, the community forest has prioritized watershed protection through careful logging over all other values. Forest staff enjoy strong support for their efforts from the board of directors, who shared their belief that they are similarly committed to sustainable forestry and source water protection.

7.2.1.2 Objective #2: Adopt Effective Governance Arrangements, Including Sound Decision Making Structures and Stakeholder Engagement Strategies

The Creston Community Forest is operated by Creston Valley Forest Corporation (CVFC), which, as of early 2010, is governed by three equal shareholders. The Town of Creston, a local environmental organization named Wildsight, and the Regional District of Central Kootenay all maintain shares, while the Lower Kootenay Band of the Ktunaxa Nation and the Creston Valley Development Authority recently relinquished theirs[12]. CVFC's shareholders also collectively appoint five general directors from the community on an annual basis. Together, the shareholders and general directors form the board of directors. At the time of research, CVFC's staff included one full-time forest manager, one full-time forest planner, and one part-time contract administrator.

The CVFC board of directors appears to be relatively representative of the many community interests in Creston, given the difficulties many community organizations face in enlisting and maintaining volunteer support. Of note the board includes two members with a background in forestry; however, no agriculturalist or representative of the Columbia Brewing Company—two industries that have a significant stake in the activities of the community forest—sat on the board at the time of fieldwork. The community forest recruits new general directors from across the community, and several directors have served

[12] The Creston Valley Development Authority relinquished its share because it, as an organization, folded shortly after the fieldwork for this study ended. While the research team was unable to interview a representative of the Ktunaxa Nation, interviews with forest staff suggest this stakeholder relinquished its share because it was no longer interested in collaboratively managing the land base. The Ktunaxa Nation had, up until that point, only shown minimal interest in the community forest and had not attended meetings for several years.

for more than one year because of a lack of interest amongst other local residents. Thus, one could assume that any community member who wishes to serve on the board of directors could do so. In principle, the fact that the town and the regional district are shareholders helps to ensure representativeness to the community. These entities could, in theory, make up for the loss of the business-like interests of the Creston Valley Development Authority with their broad mandate. The loss of the Ktunaxa Nation as a participating shareholder, however, is also the loss of an important community interest that cannot otherwise be represented on the board of directors.

The board maintains accountability to the community through one public annual general meeting, regular meetings with water user groups, a website, and monthly board meetings that are also open to the public. These mechanisms ensure that at least a portion of the community approves higher-level decisions; however, in interviews, directors described the relationship between the board and community forest staff as “hands-off”. Correspondingly, the forest manager has a large amount of discretion in making day-to-day forest management decisions. While some respondents recognized this policy as an important step in maintaining an efficient forest company, the forest manager openly stated that he would prefer to have a higher level of input from board members. He maintains that collaborative approval for major decisions would improve the number of community voices that are considered when making these decisions, and would therefore improve the overall accountability of the community forest to the public.

The conflicts between CCF and the Improvement Districts that rely on the CCF watersheds are evidently related to a perhaps unachievable set of expectations placed on the community forest by some community groups. The Kitchener and North Canyon Improvement Districts, who represent users of water from Russell and Camp Run Creeks, respectively, have been involved in a series of disagreements with the community forest surrounding plans to conduct logging in their watersheds. Interviews with representatives of these organizations clearly indicated that some water users from these Improvement Districts were wholly uncomfortable with any amount of logging in their source watersheds, or that they would only approve of logging practices, such as helicopter logging, that would not be economically feasible for a small, community-based organization such as CCF. It would be difficult for the community forest to achieve such a lofty set of expectations while still surviving as a business or fulfilling their obligations as a forest licensee. Consequently, CCF has moved forward with its plans to remove beetle-killed timber from the Russell Creek and Camp Run Creek watersheds. The community forest harvested the first load of logs ever to be removed under the provincial tenure system from Russell Creek in 2009 and, though plans to log Camp Run Creek are currently on hold, CCF representatives claimed that there is a need to eventually log in that drainage because of pest infestation issues. Forest staff also clearly stated in interviews that logging in Camp Run Creek is part of their tenure obligations, as the watershed is within CCF's timber harvesting land base.

Apart from these two cases, outcomes of community forest logging activities generally appear to have pleased community members and been compatible with community goals. On CCF's website, community forest staff describe the process of gaining the trust of the community as a long and difficult one. Several years ago, however, Arrow Creek was logged successfully and with the support of the community, demonstrating a belief amongst local residents that the operations and objectives of CCF are in line with those of most other community groups (CVFC, n.d.).

The adaptability of Creston's governance arrangements seems limited, despite obvious problems with public engagement. Interview results suggested that CCF's institutional organization has remained static for several years, though there was an indication from some board members that there would be a willingness to adapt if there was some external guidance on how to do so.

For several years, the Creston Community Forest was led by a manager who was well known in the forestry community for his progressive and non-traditional beliefs surrounding ecosystem and watershed management. A group of like-minded board members supported the manager. As indicated by interview results, this group collectively led the community forest in a direction that deviated from the traditional community mindset at the time. Support from the community built over several years in accordance with efforts by the forest manager to engage in a public education process that helped spread awareness about the ecosystem-based forestry concept. Though the manager's energy and steadfastness helped CCF with its initial planning stages, and solidified its course

towards achieving its vision, interview results from board members suggested that this manager's focus on implementing holistic forestry might have compromised CCF's financial viability. As will be described below, the manager made a series of decisions several years ago that resulted in high stumpage payments that continue to affect the financial status of the community forest. This manager was replaced by another in 2003 whose approach to forest management and fiscal issues was described as imprudent by one respondent. As a result, Creston's financial issues continued. In recent years, a new forest manager has started work with CCF. Though it was clear that this person remains committed to the principles of ecosystem based management, he is also more focused on alleviating some of CCF's persistent debt problems. His experience working with major licensees and private consulting firms assists the community forest in more successfully working within the forest economy and provincial timber appraisal system.

The community forest appears to have access to all the information it needs, as no interviewees mentioned this issue as a problem. CCF has formed a relationship with a hydrologist whose hydrological assessments provide site-specific information on ecological conditions.

Community forest staff or board members did not discuss any standard decision-making protocols in interviews. Board members spoke loosely of striving for consensus in decision-making, but no official policy required such an approach. While the forest manager voluntarily keeps board members informed

about operational decisions, evidently, the rules of the corporation do not require him to do so.

CCF demonstrates its commitment to education and training through the relationship between forest staff and contract loggers. Forest staff stated that they understand that the type of forestry Creston is trying to accomplish may be different from what loggers have done with other licensees in the past. These respondents discussed their related efforts to provide detailed guidance, and to work with new contractors in order to ensure that they understand how to implement special forest practices. The community forest has also participated in a program with a local high school that takes students into the forest on a regular basis. Interviewees did not discuss any other attempts to educate board members or adult public audiences, though some respondents recognized that an educational campaign could greatly benefit CCF operations by improving the board's knowledge of forest issues, or by increasing awareness about the community forest amongst local residents.

The community forest did not demonstrate a significant specific commitment to learning. Staff and board members did not discuss their engagement in any external training opportunities with the specific intent of improving community forest governance or operations.

Staff and board members stated that they recognize that CCF's governance arrangements are not ideal and that the engagement of both board members and community members with forest management decisions could be improved. These problems are not new, and have been plaguing the community

forest for several years. In interviews, however, the board demonstrated interest in learning about alternative governance arrangements and in putting them to use. Based on our discussions with Creston residents not directly involved with the community forest, it appears that opinions from the wider community surrounding the governance arrangements of CCF are generally neutral, as very few local residents are informed regarding the details of the community forest's organizational structure.

The conflicts with local Improvement Districts have been a significant problem in the past. At one point, as discussed by the forest manager, protest from the North Canyon Improvement District escalated to a level where an official complaint was submitted to the Forest Practices Board, and a highly critical letter was sent from one North Canyon representative to the Minister of Forests and Range. The Forest Practices Board launched an audit to investigate the complaint, but the final report did not describe any significant finding of non-compliance (FPB, 2009b). Nevertheless, in an attempt to temporarily appease the North Canyon community, CCF elected to halt operations in Camp Run Creek in 2008 and agreed not to move forward with harvest activities in that watershed for at least two years. An update of research results suggests that, according to forest staff, this conflict has subsided to an extent, though in all likelihood it could resume when the CCF's self-imposed logging moratorium expires later this year.

The level of public engagement with CCF is relatively low. Most respondents estimated that only two to five percent of local residents had any

significant knowledge of the purpose of the community forest, or its day-to-day operations. One former board member described the problem when he said, “I talked to people and I say you know, I'm on the, one of the directors on the community forest, cause they’re logging Arrow Creek and they said, ‘What are you talking about? Community forest, what’s that?’” (Interview 3-5). Board members stated that most public meetings are sparsely attended, and attempts to improve turnouts have not been successful.

The governance arrangements employed by the Creston Community Forest are, as demonstrated, imperfect in several respects. There is, however, within the Creston Valley Forestry Corporation, an understanding of some of the most significant shortcomings, and a willingness to improve. For that reason, I awarded Creston a score of *partially met* for this objective.

Factors that Inhibit Objective Achievement

Low level of engagement from board

The current ‘hands-off’ approach to management taken by Creston’s board of directors limits the variety of perspectives that contribute to decision making in the community forest. Such a policy therefore also restricts the ability of CCF to define and serve the common interest (Brunner, 2002). The forest manager stated that he actively seeks greater input regarding forest management decisions, and has gone to the length of specifically inviting representatives of the Improvement Districts to sit on the board. It is clear that a more collaborative approach to decision making would benefit the public image of the community forest, as well as possibly providing other benefits. Greater

community involvement might also reduce the pressure of high expectations that, at the moment, rests largely on the forest manager.

Low level of community engagement

Creston does not benefit from the high level of community engagement that is present in Harrop-Procter. Knowledge of water issues amongst a large portion of area residents, especially those that reside within the Town of Creston, appears to be low. According to interviewees, few people recognize the important role that the community forest plays in the well-being of the Creston community. Such low levels of engagement by the town's population may in part be due to the fact that most Creston residents are served by a large, state-of-the-art municipal water system that eliminates the direct connection between water users and the water source.

Activist nature of community

The Creston area has a history of environmental activism, especially with regard to source water protection. The activist mindset continues to this day, and has evidently contributed to the ongoing conflict between CCF and two local Improvement Districts. Interviewees from these water users groups continue to be highly suspicious of claims that logging and source water protection can occur simultaneously, despite significant improvements in technology and understanding in this regard since the 1970s.

Factors that Facilitate Objective Achievement

Trust and relationship building

The approach to relationship building that CCF has used to improve on-the-ground operations has also benefitted the forest's governance arrangements. Where strong relationships exist, they have assisted CCF in developing trust and credibility—two factors that are essential to ensuring community support for logging in and around source watersheds. As an example, CCF has had several years to demonstrate their competence with Arrow Creek water users, as the community forest has been operating in that area since its inception. CCF's operating area only expanded into Russell Creek when Creston was granted a CFA in 2008. In addition, while CCF's operating area has always included Camp Run Creek, until recently, no plans were in place to log that watershed. Therefore, the community forest has not had the opportunity to develop the same level of trust amongst water users in those areas. Not surprisingly, the conflict surrounding CCF primarily stems from the Kitchener and North Canyon Improvement Districts supplied by Russell Creek and Camp Run Creek, and not from Arrow Creek water users. One respondent highlighted the importance of a good 'track record' in improving relations between CCF and the Improvement Districts, "I think if you showed them a lot of the stuff they've done here, I don't think there would a problem with it. People would change their minds" (Interview 3-4).

Support from water users

CCF still, for the most part, enjoys support from sectors of the local population that are not involved with the Kitchener and North Canyon

Improvement Districts, yet are still dependent on well-managed source water. For example, interviews with community members indicated that agriculturalists in the valley are especially cognizant and appreciative of the community forest's activities. Some respondents felt that the objectives of the community forest fit well within a prominent local ethic that supports taking personal responsibility for the well-being of the community and its surrounding environment.

7.2.1.3 Objective #3: Achieve Financial Stability and Maintain Funding for Water Management Initiatives

At the time of research, CCF's financial position was the least stable of the community forests studied. A debt of over half a million dollars remained from early on in the community forest's existence, when a forest planning error caused CCF to incur stumpage payments and silvicultural costs of approximately 700,000 dollars[13]. Since that time, the MOFR has implemented tabular stumpage rates, which make it more financially feasible for community forests to engage in careful forestry; however, given the current state of the forest economy, Creston has still had trouble generating the amount of revenue that it requires to fully repay its initial debt.

[13] Forest staff further described this error in interviews. Under the provincial appraisal system, licensees are assessed stumpage for all timber harvested. Stumpage rates are reduced if licensees build roads in order to access timber, or if they are required to replant an area after harvest. In 2003, Creston logged a block in a manner that left ample cover to ensure natural regeneration. Therefore, CCF was assessed a stumpage rate that did not account for silvicultural obligations. Shortly afterwards, however, the forest manager realized that the characteristics of the logged stand represented a fire hazard. As a result, the community forest went back into the stand to harvest more timber. By the end of the second harvest, the forest was thinned to a degree that required re-planting to ensure it met provincial stocking standards. Thus, the community forest had to replant the whole stand, while only receiving credit under the appraisal system for the silvicultural activities that occurred as a result of the second harvest.

As discussed in interviews, the debt concerns board members, and critical local residents point to it as a reason why the community forest has not been, or will not be, successful. As one community member stated, “so, to me that tells me a lot that if you have a corporation and they're in operation for twelve years and they're still in debt...at the bank, it's not too profitable” (Interview 3-5). The debt has also prevented CCF from implementing forest management or public engagement strategies that would increase the financial burden carried by the community forest. For example, interview results suggest that board members would like to develop a value-added strategy, and that they would like to engage in a community education program. These same respondents also acknowledged, however, that the community forest cannot afford the resources to pursue either initiative, as forest staff are often too busy just trying to make sure CCF can pay its bills. One board member described the difficulties the community forest has had in meeting simultaneous objectives when he said, “he (the forest manager) hasn’t had time. He’d been scrambling too much to keep the thing alive. And I sit there...and I say, ‘That’s – that may be true but part of the problems that we’re facing right now are lack of education.’ And so, maybe we’re going to have to rearrange priorities” (Interview 3-3).

CCF does not benefit from the high level of volunteerism that has helped Harrop-Procter through some of its toughest financial troubles. Interview results suggest that staff, however, have been generous with their time and have worked for periods without pay under the assumption that they would be compensated when possible.

In recent years, CCF has started exporting some of its lowest quality logs to the United States in order to increase revenue. The strategy has been highly beneficial economically to the community forest, given its close proximity to the border and the higher log prices that can be accessed in the United States. Export of raw logs, however, is also a highly controversial issue in the Creston area because it supplies wood for processing elsewhere, and several community members discussed CCF's involvement in the activity as a key factor affecting the level of local support for community forestry.

Future schemes that CCF representatives discussed as having potential to improve the community forest's financial viability include FSC certification or negotiating payment from other local industries for the provision of clean and plentiful drinking water from the Arrow Creek watershed. Interview results from Harrop-Procter suggested that FSC certification would not necessarily improve the price CCF can attain for its logs, but that it may help to open up access to alternative markets or funding sources. CCF staff and board members said that they hoped that FSC certification would help to convince Creston's industrial water users that their water comes from a sustainably-managed land base, and that they should contribute financially to the community forest in order to help guarantee the future condition of their source watershed. Experience elsewhere in the world suggests such an arrangement can be mutually beneficial for all parties involved. For example, a beer company in Costa Rica pays the government which in turn pays local landowners to preserve their private forests

in order to ensure that the quality and quantity of water available meets the standards required for beer production (Miranda, Porras & Moreno, 2003).

In a recent update of my research, CCF staff indicated that the forest's financial position has significantly improved as a result of a few profitable logging activities over the past year. The current forest manager's focus on maintaining a small, competent staff that is well-versed in forest economics and planning has also helped Creston achieve recent financial successes. Such a quick change of circumstances demonstrates that a few hundred thousand dollars of debt is not insurmountable in the forest industry when there are timber resources available and prices are sufficiently high. For this reason, I awarded the Creston Community Forest a score of *partially met* for the objective of achieving financial stability.

Factors that Inhibit Objective Achievement

Strained relationship with local mills

CCF's rapport with local mills has historically been somewhat strained, which has limited the opportunities available for the community forest to sell its wood locally. Interviewees discussed several reasons for the poor relationship. Some community members thought it was because part of the original harvest volume allocated to Creston came from the quota and traditional operating area of one of the local mills (i.e., the mill's AAC was reduced by the amount allocated to CCF). Other respondents thought it was because one of the mills disapproved of CCF's involvement in the export of raw logs. Still others thought it was simply due to a lack of mutual understanding regarding logging practices and approaches to forestry. Representatives from both the community forest and the

mills stated, however, that the relationship between their organizations has improved over time. A recent update of research results suggests that a series of mutually beneficial transactions occurred between CCF and one mill over the past several months.

Detrimental tenure arrangements

Forest staff and board members also identified the financial difficulties brought on through earlier issues with stumpage rates as a factor that has had lasting impacts on the economic viability of CCF.

Factors that Facilitate Objective Achievement

Beneficial tenure arrangements

Most staff and board members discussed CCF's recent switch from operating under a Non-Replaceable Forest License to a Community Forest Agreement as a great benefit to the organization. These respondents recognized tenure provisions available under a CFA, and not a Non-Replaceable Forest License, as changes that had made financial resources available for more rapid progress towards the achievement of CCF's environmental management objectives, including source water protection. The area-based tenure, tabular stumpage rate, exemption from timber cruise requirements, and long-term agreement were all cited as beneficial features of the tenure, for the reasons already discussed in this report.

Option to export logs

Another beneficial economic factor discussed by forest employees relates to Creston's proximity to the US border. CCF has used export opportunities,

especially over the past few years, to earn profit on what it calls the 'guts and feathers', or less desirable species or grades of wood.

7.2.1.4 Objective #4: Fulfil Legal Requirements in order to Maintain Authority Over the Watershed

At present, all results suggest that CCF has fulfilled all requirements of their tenure. A review of Compliance and Enforcement annual reports reveals no enforcement actions against CCF since 2003 (MOF, 2004; MOFR, 2005b; MOFR, 2006; MOFR, 2007c; MOFR, 2008b; MOFR, 2009). Interview results from Ministry personnel and forestry staff also did not include any discussion of a failure by Creston to meet its legislated obligations.

In 2008, however, a Forest Practices Board audit found that the community forest failed to meet provincial stocking standards on over 170 hectares of harvested land. Though CCF staff stated that they intended that most of this land remain sparsely vegetated for the purposes of interface fire management, there were also areas where that was not the case. The community forest was required to immediately regenerate some sites, and submit revised stocking standards for others (FPB, 2009a).

Due to this past infraction, I awarded CCF a score of *partially met* for the objective of meeting provincial tenure obligations.

Factors that Inhibit Objective Achievement

Detrimental tenure arrangements

In interviews, CCF representatives discussed their opinion that the systems designed to regulate forestry in BC are reductionist and fail to adequately support licensees who attempt to practice more careful, holistic

forestry. As one respondent said, “forestry is wonderfully, mysteriously complicated, but our regulatory systems are designed to simplify it” (Interview 3-3). Interviewees pointed to the Forest Practices Board investigation discussed above as confirmation of this belief.

Factors that Facilitate Objective Achievement

Research results identified no factors that facilitated the community forest’s achievement of this objective.

7.2.2 Community-Specific Objectives

Because the Creston Community Forest has been operating longer than most others in the province, forest staff and directors have a more extensive background in managing to protect source water. This background has allowed for the development of a detailed set of management objectives and strategies that are clearly expressed in CCF’s Management Plan (CVFC, 2008). Many of the objectives described in the Management Plan are similar to the common objectives already discussed above; however, it is possible to infer three additional objectives from the section of the plan that discusses strategies for drinking water management. First, CCF endeavours to develop and employ innovative strategies for road building, trail design, and riparian management in order to maintain or improve source water quality. Second, when economically and physically feasible, the community forest attempts to rehabilitate existing problem areas within watersheds that contribute high levels of sediment to surface flows. Third, operating under the assumption that a diverse forest is a healthy forest that produces high quality water, CCF aims to use silvicultural

systems that minimize equivalent clearcut area and maximize stand-level diversity (CVFC, 2008).

When I asked community members how they would ideally see their source watershed managed, many had the same opinions that residents of McBride and Harrop-Procter expressed. As town residents rely on resources from the surrounding forests for their livelihood, a high percentage of interviewees stated that they would prefer to see their drinking watersheds managed in a way that allows for use or harvest of multiple forest resources, while simultaneously protecting water quality, quantity, and timing of flow.

7.2.2.1 Objective #1: Employ Innovative Strategies for Road Building, Trail Design, and Riparian Management

Several of CCF's earliest cut-blocks demonstrated the types of modern and novel approaches to forest management that were reflective of ecosystem-based management principles and the community forest's dedication to interface fire management. In interviews, community forest staff, board members, and loggers alike spoke of the pride they had in these areas once harvest was completed. One former staff member even suggested that other licensees in the area have adopted some of CCF's silvicultural approaches. For this reason, I awarded Creston a score of *met* for this objective.

Factors that Inhibit Objective Achievement

Lasting debt-load

As evidenced by site visits and discussions with forest staff, Creston's financial troubles, in combination with the overwhelming nature of the mountain

pine beetle epidemic and the recent state of the forest economy, have prevented CCF from working towards this objective in recent years. Most harvests over the last few years have been medium sized, relatively open cut-blocks designed to remove all or most of the pine in order to prevent beetle infestations.

Factors that Facilitate Objective Achievement

Motivated staff and supportive board members

Respondents stated that, in the early days of the community forest, CCF benefitted from a forest manager who was deeply committed to, and had extensive experience in, ecosystem-based management. Evidently, this manager ensured implementation of innovative forest practices by prioritizing watershed protection over all other objectives. Creston board members shared similar ethics and supported the forest manager in his approached to forestry.

7.2.2.2 Objective #2: Rehabilitate Existing Sediment Sources

No information regarding this objective was available from the research results. Therefore, I did not award a score for its achievement.

7.2.2.3 Objective #3: Minimize Equivalent Clearcut Area and Maximize Stand-Level Diversity

The fulfilment of this objective goes hand in hand with that for the first objective discussed in this section. According to Creston's forest planning documents, Creston designs innovative forest practices in order to promote a diversity of species and age classes on every hectare of the community forest. We confirmed this result through site visits to logged areas. Forest managers

also shared, in interviews, their opinion that equivalent clearcut area is one of the most important factors in determining the potential for logging activities to affect watershed conditions. For these reasons, I awarded CCF a score of *met* for this objective.

Factors that Inhibit Objective Achievement

Lasting debt-load

The same barriers that inhibited CCF's ability to employ innovative forest practices apply here. The economic downturn and mountain pine beetle outbreak have negatively affected CCF's ability to achieve this objective in recent years.

Factors that Facilitate Objective Achievement

Motivated staff and supportive board members

The same factors that promoted CCFs ability to employ innovative forest practices apply here. Creston has historically benefitted from progressive and environmentally-conscious staff and board members.

7.2.2.4 Objective #4: Manage Watersheds in a Manner that Allows for Source Water Protection while Simultaneously Allowing for the Use or Harvest of Multiple Forest Resources

At present, all results suggest that this objective has been 'Met' by the community forest, as Creston residents are fully able to access all portions of crown land managed by CCF.

Factors that Inhibit Objective Achievement

Research results identified no factors that inhibit the community forest's achievement of this objective.

Factors that Facilitate Objective Achievement

Involvement of community members on board

The same practice of community involvement in decision making that has allowed other community forests to achieve this objective also applies to the Creston Community Forest.

7.2.3 Summary of Scores

Table 6: Evaluation scores for the Creston Community Forest

Objective	Score
Engage in forest planning and practices that promote source water protection	Met
Adopt effective governance arrangements, including sound decision making structures and stakeholder engagement strategies	Partially Met
Achieve financial stability and maintain funding for water management initiatives	Partially Met
Fulfil legal requirements in order to maintain authority over watershed	Partially Met
Employ innovative strategies for road building, trail design, and riparian management	Met
Rehabilitate existing sediment sources	Unknown
Minimize equivalent clearcut area and maximize stand-level diversity	Met
Manage watersheds in a manner that allows for source water protection while simultaneously allowing for the use or harvest of multiple forest resources	Met

8: COMMON THEMES AND RECOMMENDATIONS

Several key findings, or ‘common themes’, are apparent in the discussion provided above. Below, I discuss these themes and offer recommendations for how the community forests I studied, and others, can eliminate or overcome some of the major obstacles they face in their attempts to manage and protect source watersheds.

The present study addresses a relatively small number of case studies and the experiences of each community forest I studied were very different. These factors indicate that caution should be exercised in attempting to generalize my findings and recommendations to wider scales. On the other hand, the fact that I was able to identify common themes from these three diverse cases, and that my findings are, to a large extent, supported by those of other studies, indicates that there are some shared problems that community forests face as businesses, tenure holders, and community based organizations. As such, the recommendations offered here could be applicable to community forests outside the scope of this study. While certain findings and recommendations are specific to the CFAP, others could be useful for community forests or community-based source water management organizations at wider geographical scales.

8.1 Satisfactory Record of Source Water Protection but Deficiencies in Planning for the Future

Community forest harvest activities are currently not detrimentally affecting source water quality, quantity, or timing of flow; however, deficiencies in forest planning exist that affect the guarantee of adequate source watershed conditions in the future.

8.1.1 Summary

Local water users considered source watershed conditions in all of the case study forests to be satisfactory. Two of the three community forests had developed their own water monitoring programs, but all of the cases had access to monitoring information in one form or another. The community forests, however, demonstrated different levels of willingness or ability to respond to threats to watershed conditions.

Forest practices for all three forests generally fit within the common expectations for logging in source watersheds, though there were some suggestions that contract loggers in one forest were not familiar with modern forest regulations. Other forests dedicated significant resources to ensuring contract loggers were aware of, and prepared to implement, specific forest practices designed to protect source water quality.

The approach to forest planning demonstrated by the McBride Community Forest resulted in significant deficiencies in MCF's accountability to the community and the ability of the community forest to think strategically. The Harrop-Procter and McBride Community Forests were also failing to address the threat of wildfire to the degree that some stakeholders felt was necessary. Again,

research results linked low prioritization of interface fire management to an absence of forward planning within these community forests.

8.1.2 Recommendations

1. *Community forests should develop long-term, multi-objective strategic plans in order to map out future operations and to prioritize source water management issues. Where feasible, community residents and other stakeholders should develop these plans collaboratively.*

Some community forests have engaged in strategic planning exercises in order to ensure that current forest management approaches do not compromise the future economic viability and ecological health of the forest. Strategic forest planning helps managing entities to orient their activities in order to maximize the utility they are able to gather from the landscape. Further, *multi-objective* forest planning allows communities to determine which types of benefits are most important to them, and to develop management strategies for maximizing those benefits (Pukkala, 2002). Based on the results of my research, community forests could best use strategic plans to determine:

- how specific portions of the land base will be managed over time;
- how the community forest intends to achieve its objectives regarding environmental management, community engagement, and financial viability; and,
- how the community forest intends to adapt to anticipated changes in environmental, economic, and social systems over time.

Community forests may have already addressed the first bullet in this list through a “Total Chance Plan”, or “Total Resource Plan”, which “designs long-term forest development and guides timber harvesting over an entire area, such

as a watershed, and confirms how approved objectives for identified resource values will be achieved on the ground" (MOF, 1993, 1). Total Chance Planning is a useful tool for community forests responsible for source water management, as the process helps identify ecologically sensitive areas, and it requires that appropriate management approaches be defined for those areas. The MOFR does not require that licensees develop a Total Chance Plan, but it is a process that many have voluntarily engaged in because of the efficiencies it can help produce in harvesting and road building (BCTS, 2009; Bell & Apostol, 2008).

Strategic plans should include clear, measurable objectives as well as realistic strategies for how to achieve those objectives (Ministry of Sustainable Resource Management, 2004). The process to develop a strategic plan will likely take significant time and volunteer resources, especially if it is developed collaboratively among a variety of community stakeholders. The outcomes of a strategic planning process, however, could serve to greatly reduce conflict originating from community groups by clarifying what areas will be harvested, and for what purpose. The plan could also help members of the community to identify shared goals for the community forest and to clarify their expectations about what the community forest is able to achieve regarding environmental management and economic stimulus.

At the time of research, Harrop-Procter had requested that a board member develop a strategic plan for the community forest, with the specific objective of clarifying how HPCF will address interface fire management issues. The Kaslo Community Forest just completed a strategic planning process that,

unlike the Harrop-Procter process, was a collaborative effort amongst a group of diverse community stakeholders. The Kaslo Community Forest engaged in the process because of a long history of disagreement between various sectors of the local population regarding how the community forest should manage its land base, and how it should distribute benefits related to forestry. Trained mediators facilitated the process, which forest staff considered highly successful and a worthwhile use of resources. This type of process, though more costly and time consuming, would provide more benefits to community forests than a process undertaken by one or two people, as it could help to mediate conflict at the same time that it develops strategies for future management.

2. *Community forests should develop their own set of Standard Operating Procedures for logging activities in source watersheds*

Logging companies sometimes develop Standard Operating Procedures (SOPs) to ensure that workers implement the institution's own policies for forest operations in a consistent manner (Interfor, 2004). Community forests could use SOPs to ensure that contract loggers are aware of the specific mandate of the community forest, and to ensure that all logging crews adhere to a set of forest practices that protect source watershed conditions. In the case of the McBride community forest, Standard Operating Procedures for logging in source watersheds would provide much-needed guidance to the many small, independent contractors who work in the community forest. The Harrop-Procter

and Creston Community Forests could also distribute SOPs to logging crews in order to reduce the resources forest staff must commit to supervising contractors.

Each community forest should develop their own Standard Operating Procedures, as they need to reflect the specific environmental, social, and economic conditions that affect the organization and land base. They should be well researched, and reflect commonly accepted 'best practices' for logging in source watersheds. The Community Watershed Guidebook, produced by the BC Ministry of Forests under the *Forest Practices Code*, could provide a starting point (see: MOF, 1996). The British Columbia Community Forest Association could provide extension support to help community forests develop SOPs in the same way that the organization has helped some communities navigate the application process for the CFA program.

8.2 Variable Demonstration of Collaborative Governance Principles

The ability of governance structures employed by community forests to serve the common interest varies widely; however, the governance structures that are most able to achieve this goal incorporate all community interests in decision making to the highest degree possible.

8.2.1 Summary

The community forests addressed in this report employed a variety of approaches to governance. Collaborative governance improved source water management in successful community forests in three ways:

- the inclusion of as many stakeholder groups as possible in decision-making ensured that the interests of one water users' group were not prioritized over another;

- collaboration among stakeholder groups facilitated learning processes that reduced the level of resistance to community forest activities in source watersheds; and,
- high levels of mutual understanding, and low levels of conflict, promoted community support for the forest in the valuable form of volunteerism.

8.2.2 Recommendations

3. Community forests should develop a set of standard protocols for decision-making

In the same way that community forests could benefit from a set of Standard Operating Procedures for logging in source watersheds, they could also benefit from a standardized process for their own decision-making. Leach and Pelkey (2001) state that well-defined decision-making protocols assisted many collaborative watershed management groups in achieving their goals. Frame et al. (2004) further agree that clear ground rules are an important aspect of collaborative resource management processes. Such protocols could help improve a community forest's accountability to its constituents by mandating that decisions are made in a manner that considers all community interests, instead of on an ad-hoc basis. Each community could develop decision-making protocols that serve its own needs. For example, the Creston Community Forest could introduce a protocol that requires board approval for certain forest management decisions.

The Harrop-Procter Community Forest has, in some ways, already developed standard decision-making protocols; however, McBride and Creston

have not. The Likely-Xat'sull Community Forest developed, early on in its existence, standard protocols for sharing work amongst board members, making board-level decisions, solving disputes, allocating logging contracts and distributing benefits (LXCF, 2002). As LXCF is run as a partnership between two organizations, these policies have been instrumental in ensuring equitable governance and a well-functioning community forest.

4. *Community forests should consult experts in the fields of stakeholder engagement and conflict resolution, so that forest managers can focus more on forestry. The British Columbia Community Forest Association should consider offering assistance in this regard.*

Research results clearly demonstrated that forest managers, especially in McBride and Creston, were spending a large percentage of their time mediating community-based conflict, or dealing with other political issues. The administrative and operational requirements of running a forest company are already extensive. Community forest staff do not have adequate resources, or training, to be acting as both general managers and public relations specialists.

Frame et al. (2004) state that trained support staff and independent facilitators greatly improve collaborative resource management processes. Consulting experts in the field of stakeholder engagement and conflict resolution could help community forests to effectively and efficiently deal with public concerns. The small budgets that community forests operate with would likely eliminate the possibility of acquiring professional assistance on a case-by-case

basis; however, the BCCFA could help community forests to pool funds and gain collective access to this type of support.

5. *Community forests should give greater priority to public education campaigns, in order to improve public knowledge of the community forests' approaches to source water management*

Many BC residents retain feelings of mistrust for the forest sector, especially when it comes to logging in source watersheds (Koop, 2007). These feelings may change when the forest comes under local control, or, they may not. The cases studied demonstrate that community forests should not assume the surrounding population will be supportive of their efforts. Instead, they should work to show, not tell, their critics that their approach to forestry involves a commitment to management strategies that protect source water quality. All three community forests recognized that public education could benefit their operations by improving mutual understanding between the organization and local residents. It was also clear that education of board members could assist forest managers in making more collaborative and informed decisions. Kenney et al. (2000) stated that about two thirds of the collaborative watershed management groups they studied engaged in educational campaigns. Further, these groups listed public and participant education as one of the key factors to their success.

To date, however, the community forests we studied have prioritized the fulfilment of other responsibilities. It is quite possible that public education could reduce the amount of time and resources needed for these other responsibilities,

as levels of conflict could diminish and levels of volunteerism could improve, accordingly.

8.3 Watershed Stewardship Inhibited by Financial Issues

Community forests are surviving financially, but have very limited financial resources to engage in activities, not related to timber harvests, that promote source water protection and awareness.

8.3.1 Summary

Though the Creston and Harrop-Procter Community Forests carry significant debt-loads, and have for several years, their financial positions have proved manageable, and their debts have steadily decreased over recent years. The McBride Community Forest's finances have been stable throughout its existence. None the less, these three community forests have had difficulty accessing the type of revenues that they require to engage in ongoing systematic water monitoring or public education programs.

The most commonly-cited barriers to developing more stable financial positions were:

- a lack of capacity to research and implement moneymaking strategies;
- no economies of scale to allow for the development of reliable relationships with value-added producers;
- not enough unconstrained, productive forest land to subsidize management activities in source watersheds; and,
- expensive tenure obligations and start-up costs.

These issues have also been recognized by other authors as important factors that inhibit the success of community forests (Anderson and Horter, 2002; Ambus, 2008; Usborne, 2010).

8.3.2 Recommendations

6. *Community forests in different communities should work together to pursue strategies for greater financial stability*

Though the present study demonstrates that economic issues have hindered community forests' abilities to achieve their source water protection goals, it is beyond the scope of my research to investigate and recommend detailed strategies for improving the financial status of community forests. Several other authors have already attempted to address this issue (see: Anderson and Horter, 2002; Ambus, 2008)

The British Columbia Community Forest Association has dedicated significant resources to helping community forests access information and form partnerships that could help them implement strategies related to value-added manufacturing or bioenergy. The BCCFA should continue and, if possible, expand these programs, and community forests should consult and utilize any research and programs introduced by the BCCFA to the full extent possible.

7. *Government should expand the land base of community forests operating in highly constrained areas in order to allow for greater opportunities for profitable logging activities*

Several of BC's community forests, including those featured in this study, have stated that an expanded land base would greatly assist them in achieving financial viability. Anderson and Horter (2002) shared this opinion. For community forests that are particularly concerned with source water protection, more productive land with less operational constraints would allow these organizations easy access to timber. As such, land base expansion could reduce the pressure on these organizations to log in watersheds simply in order to pay staff or other expenses. Of course, because nearly all of BC's timber harvesting land base is currently allocated to existing forest licensees, such an undertaking would require reallocating quotas from some licensees to others. Therefore, the MOFR would need to demonstrate a significant commitment to the future prosperity of the CFAP. Community forest expansion is also a current focus of the British Columbia Community Forest Association's extension programs.

8.4 Watershed Stewardship Inhibited by some Tenure Requirements

Community forests are generally fulfilling their legal obligations; however, some tenure requirements inhibit the success of community forests and their source water protection objectives

8.4.1 Summary

The research results demonstrated that none of the community forests studied had significantly failed to meet its legal obligations as timber licensees. It was clear, however, that while certain aspects of the CFA tenure were beneficial to community forests, others hindered their abilities to achieve goals other than timber harvest. Specifically, forest managers cited administrative obligations as

time consuming, expensive, and too extensive for licensees with small AACs. This finding was shared by Anderson and Horter (2002). Some respondents also shared their opinion that certain community forests subscribed to a philosophy concerning forestry that was incompatible with that of the Ministry of Forests and Range. As such, these respondents felt that community forests did not receive adequate support from the provincial system that administers forest legislation. The Silva Forest Foundation confirmed this finding in its 2006 report on BC community forests.

8.4.2 Recommendations

8. *Government should consider introducing a new form of tenure that allows communities to manage their source watersheds without having to engage in extensive timber harvests*

There remains in BC a significant demand amongst rural communities for greater control over their source watersheds (Koop, 2007). Though some community forests have been successful at protecting their drinking water, at least in the short term, through the Community Forest Agreement, an alternative form of tenure could allow for more stable protection over the long term. Only some of the respondents in our study felt strongly that a new form of tenure is necessary; however, alternative arrangements could help to serve communities that have engaged in the CFAP with the primary goal of source water protection. By eliminating the requirement to run and operate a logging business, an alternative land management arrangement could reduce threats to the stability of

community-led watershed protection initiatives. These threats include failing as a logging business or as a community-based organization.

Based on the results of the present study, an alternative tenure arrangement should provide long-term opportunities for protection, bestow management rights to local populations, and still allow for occasional timber harvests, when necessary, to remove threats to watersheds posed by wildfire or pest outbreak. It should require that communities follow a broadly accepted list of best practices for logging in source watersheds, in order to eliminate the possibility that struggling communities would expand timber harvests during difficult economic times. A provincial body that does not expect that logs from source watersheds will significantly contribute to the provincial timber supply should administer the tenure. In this way, community forests could log selectively to maintain forest health, without experiencing pressure from the MOFR to manage the forest as if it were part of the timber harvesting land base. Government could arrange the new form of tenure to transfer management rights for multiple resources, allowing communities to administer non-timber forest products, recreation, and ecological services such as carbon sinks, in addition to source watersheds. As such, further economic opportunities could be made available to struggling communities, and tenure holders could take a holistic and integrated approach to land and watershed management.

Several studies on community forests have recommended an alternative form of tenure (see: Anderson and Horter, 2002; Meyers Norris Penny LLP and Enfor Consultants, 2006). These authors generally agree that a land trust model

could provide opportunities for community forests to set their own ecosystem management priorities. The City of Vancouver has negotiated a land management agreement for their watersheds that could act as a prototype for other communities. The city holds 999-year land leases, under the *Land Act*, for its three source watersheds and pays only one dollar per watershed, per year, to the Crown (Greater Vancouver Water District, 2002).

9. *Government should adapt legislation to reflect the specific situation of small to medium-sized tenures*

If an alternative form of tenure is not possible, the BC government should, at minimum, consider revising the *Forest and Range Practices Act*, the *Forest Act*, and their associated regulations, to lessen the administrative burden on community forests. Other authors have also identified a need for the MOFR to reassess its approach to regulating the CFAP and its licensees (see: Meyers Norris Penney LLP & Enfor Consultants, 2006).

As discussed in the pages above, allowing community forests to operate under one blanket cutting-permit would lessen the time and resources required to have individual cutting permits approved. The policy could also help facilitate the implementation of landscape-scale management strategies. There are, of course, risks in allowing a licensee greater freedom in deciding when, where, and what to harvest. CFA holders with significant profit motives or other priorities relating to economic gain could use such a policy in way that might compromise the future health or productivity of a forest. Community forests must thus demonstrate their ability to responsibly implement landscape-level forestry through planning and

on-the-ground operations. Government-led monitoring processes, especially within the first few years of implementing a 'one cutting permit' policy, will be very important.

The MOFR should also consider revising legislation to reflect the increasingly accepted paradigm of ecosystem-based management (McAfee & Malouin, 2008). Regulations should be adapted for licensees who demonstrate a commitment to more holistic forestry. Standard regulations for environmental management are not always appropriate when the managing body considers whole landscapes and all ecosystem values in its approach. As one interviewee stated, "we don't fit and we're still in the era of transcending from the goals and objectives of communities versus...the longstanding goals and objectives of the industry (Interview 3-3).

9: CONCLUSIONS

9.1 Current Opportunities for Source Water Protection under the CFAP

I developed four key findings, or 'common themes' from my discussion of the results. They are:

1. *Community forest harvest activities are currently not detrimentally affecting source water quality, quantity, or timing of flow; however, deficiencies in forest planning exist that affect the guarantee of adequate source watershed conditions in the future.*
2. *The ability of governance structures employed by community forests to serve the common interest varies widely; however, the governance structures that are most able to serve the common interest incorporate all community interests in decision making to the highest degree possible.*
3. *Community forests are surviving financially, but have very limited financial resources to engage in activities, not related to timber harvests, that promote source water protection and awareness.*
4. *Community forests are generally fulfilling their legal obligations; however, some tenure requirements inhibit the success of community forests and their source water protection objectives.*

This research shows that the community forests I studied have been able to effectively manage source watersheds over the short time that they have existed. There are threats, however, to the long-term stability of these community forests that, in turn, also threaten the degree of control a community is able to

enact over its drinking water source. Deficient forest planning in some community forests creates additional long-term threats to watershed conditions.

Not surprisingly, the factors that either inhibit or facilitate the community forests' abilities to protect source water are very much dependent on the history of the region and the social conditions that surround the organizations. In all forests examined, however, the level of direct dependence a population had on high quality source water, either for drinking or industrial activities, greatly impacted community support for water management initiatives and other community forest activities.

Economic conditions were also a central concern, as many community forests, being relatively small players in an industry dominated by multi-national corporations, were struggling to survive financially. The expensive nature of well-planned and carefully-implemented forest practices further taxed the finances of community forests. Studies by many other authors confirm that some community forests have struggled to remain economically viable since the first stages of the CFAP (Anderson and Horter, 2002; Meyers Norris Penny LLP & Enfor Consultants, 2006; Silva Forest Foundation, 2006; Ambus, 2008).

In addition, and as predicted in the literature on collaborative resource management (see: Frame et al. 2000; Kenney et al. 2000; Leach and Pelkey, 2001), governance arrangements influenced community forests' abilities to implement source water protection projects. Board structures, stakeholder engagement strategies, and decision-making protocols all affected the number of

people willing to get involved in the organization, and, therefore, the ability of the community forest to serve the common interest.

Finally, tenure arrangements both enabled and hindered source water protection by community forests. Some aspects of the Community Forest Agreement, including exclusive harvest rights, tabular stumpage rates, and exemptions from timber cruising requirements, made water management easier for community forests than for other types of licensees. Other aspects, including onerous administrative requirements, were cited as factors that drained community forests' already thin human and financial resources. Again, these findings are echoed by other authors, though not specifically in the context of community forests' role as entities engaged in source water management (McIlveen & Bradshaw, 2005; Meyers Norris Penney LLP & Enfor Consultants, 2006; Ambus, 2008).

9.2 Recommendations for Community Forests and Government

Several respondents shared their opinion that community forests will remain an important part of BC's timber tenure system, and that the CFAP could expand in the future. Accordingly, new community forests with the objective of source water protection could benefit from knowing what aspects of other approaches have been beneficial, and what aspects should be revised.

Based on the common themes listed above, I offered a set of nine recommendations regarding how community forests and government could improve opportunities for source water protection under the CFAP. The recommendations are:

1. *Community forests should develop long-term, multi-objective strategic plans in order to map out future operations and to prioritize source water management issues. Where feasible, community residents and other stakeholders should develop these plans collaboratively.*
2. *Community forests should develop their own set of Standard Operating Procedures for logging activities in source watersheds.*
3. *Community forests should develop a set of standard protocols for decision-making.*
4. *Community forests should consult experts in the fields of stakeholder engagement and conflict resolution, so that forest managers can focus more on forestry. The British Columbia Community Forest Association should consider offering assistance in this regard.*
5. *Community forests should give greater priority to public education campaigns, in order to improve public knowledge of the community forests' approaches to source water management.*
6. *Community forests in different communities should work together to pursue strategies for greater financial stability.*
7. *Government should expand the land base of community forests operating in highly constrained areas in order to allow for greater opportunities for profitable logging activities.*
8. *Government should consider introducing a new form of tenure that allows communities to manage their source watersheds without having to engage in extensive timber harvests.*
9. *Government should adapt legislation to reflect the specific situation of small to medium-sized tenures.*

9.3 Final Thoughts and Future Directions

It comes as no surprise that the evaluation results show the Community Forest Agreement Program is not an ideal venue for communities to gain control over, and protect, their drinking water. To date, however, the provincial

government has not been amenable to the idea of removing source watersheds completely from the timber harvesting land base. The question therefore becomes—are community forests doing a better job at protecting source water than other licensees? The answer to that question greatly depends on the licensee to which a community forest is compared. Most respondents considered modern forest regulations and guidelines to be stringent enough to protect source water *if* licensees operate strictly within them. Some licensees, of course, are more motivated than others to adhere to the regulations. For example, many small to medium-sized mills in BC also hold timber tenures in community watersheds. Representatives from these mills stated that they are, in essence, de-facto community forests, as mill owners are known to local residents and therefore accountable for their management decisions.

This research is only one step in understanding how local control over forests can help alleviate some of the risks—perceived and real—associated with logging in source watersheds. As each community forest is unique, future studies could test the findings of this research at wider scales, and further explore whether other small tenures are able to achieve similar goals. While community forests are still relatively young in BC, some have now learned enough to share their lessons with others. This knowledge-sharing process, facilitated by organizations such as the BC Community Forest Association, and further supported by studies like this one, will be crucial to the future success of the CFAP.

APPENDIX

Sample Interview Questions

In what ways are you involved with the community forest?

How important do you think drinking water protection should be to the community forest?

Do you think the community forest is doing a good job at managing the watershed?

What do you think the community forest is doing well? What could it do better?

In your experience with the community forest, what water-specific objectives do you think it works towards on a daily basis?

In your experience with the community forest, what specific forest practices do you see being employed with the specific objective of water protection?

Do you think these practices are good enough to ensure quality drinking water?

Do you think other members of the community support the community forest and its efforts to protect drinking water?

Do you think other objectives of the community forest, such as job creation or habitat protection, are preventing good water management?

Do you think the community forest tenure allows the community to effectively achieve source water protection?

What changes to the regulatory system do you think should be made to allow the community forest to be more successful?

Without the option of the CFA, what do you think the community would have done to protect its source watershed?

Do you think the community forest's board of directors is well structured?

What lessons has the community forest learned about water management throughout its existence?

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