EVALUATING BC'S COMM

by

Lauren Rethoret
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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	(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 resp

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.

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.

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

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 for10051➢3h3(m)3(m)-6(u)-3(n)-3(4(y)] TJETBT1 0 0 2 347704 543.31 Tm[(-)] TJET

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

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 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

undertake community forestry consistent with sound principles of

basin management or watershed management, integrated water resources management

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)

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

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,

this same act, and not timber harvest, mining, or agriculture

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

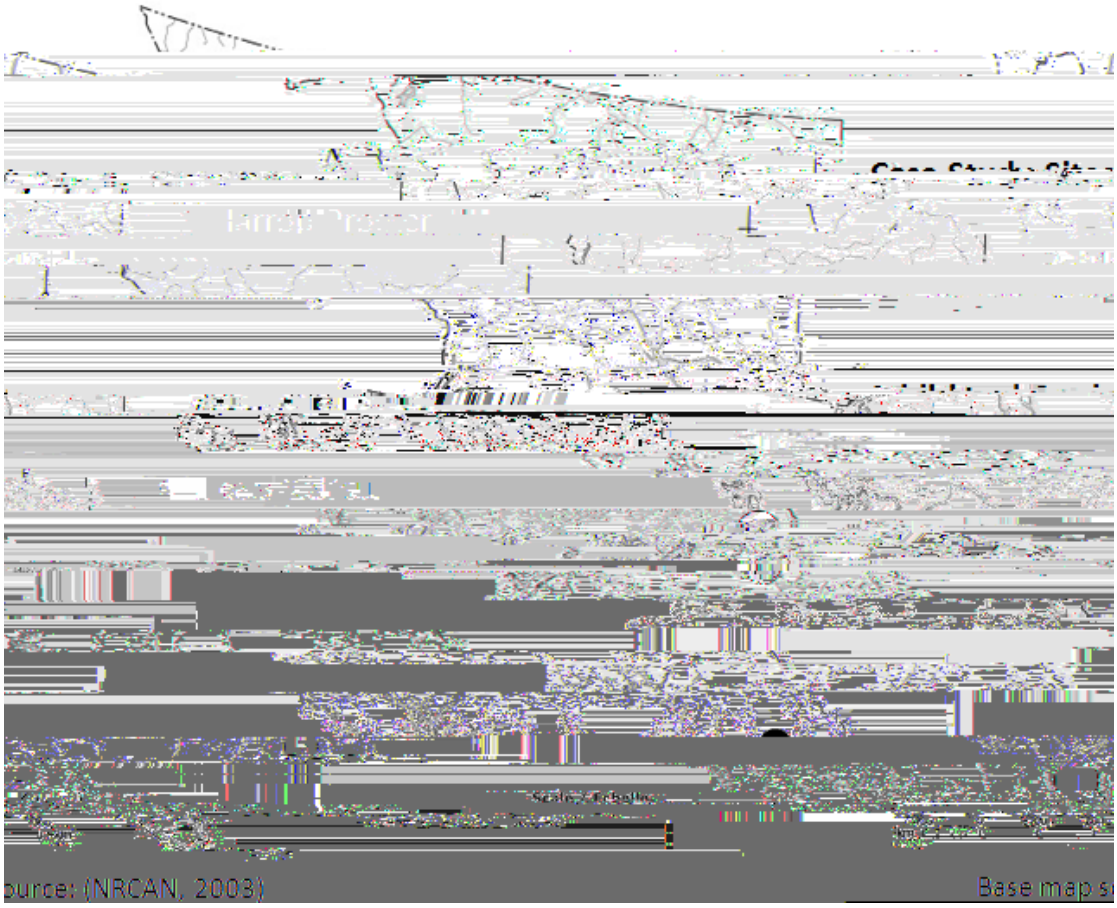
A long history of contraventions under FRPA and its predecessor, the Forest Practices Code (see, e.g., MOFR, 2007c; MOFR, 2008b; MOFR, 2009) , indicates that, despite the highly regulated nature of the logging industry, citizens reliant on drinking water originating in logged areas may have a genuine 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

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-

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

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).



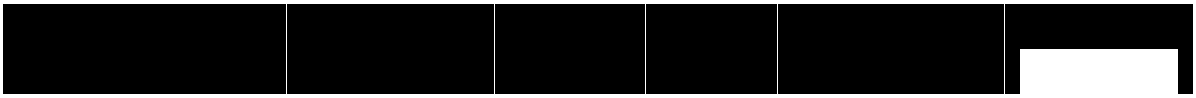
The Harrop-Procter Community Forest (HPCF), on the west arm of Kootenay Lake, is a small community forest that has an area of 10,680 hectares, and a negotiated allowable annual cut[3] (AAC) of just over 2,600 cubic metres. The MOFR awarded the forest a pilot agreement in 1999, and converted it to a CFA 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.



In order to develop recommendations to improve the management of

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

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

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

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

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 , (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

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)

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 rran

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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 h(f)-11(ine)cs of n. 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.

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 oobpl69(fo)1(t)6(h)-3(e)-3(a)-(inciares06.75T1 0 0 1 89.7.

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

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.

I scored the community forest‘s achievement of each objective using the scores, , , or . 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 . If most of the criteria were realized, I awarded a score of . If most of the criteria were not realized, I awarded a score of . 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 instead of .

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

presence of multiple group members allows participants to form and express opinions that may

which research subjects operat

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,

I developed other codes from the data. These codes were generally used to serve my second research objective,

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

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

Interview results and a review of monitoring documents indicated

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‘ perceo D mO] q e

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-

common expectations regarding logging to protect source water. A hydrologist

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,

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.

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.

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).

Interviews with forest staff indicated that Harrop-

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-

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)

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

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

the opinion that the HPCC has captured the HPWPS, resulting in the weakening

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

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 for this objective.

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.

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).

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).

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

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

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 for the objective of achieving and maintaining financial stability.

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.

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

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.

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

inaccessible. These funding sources have been instrumental in helping the community forest to survive past the expensive first stages of operating a logging

All results suggest that this objective has been fully 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.

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

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	

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).

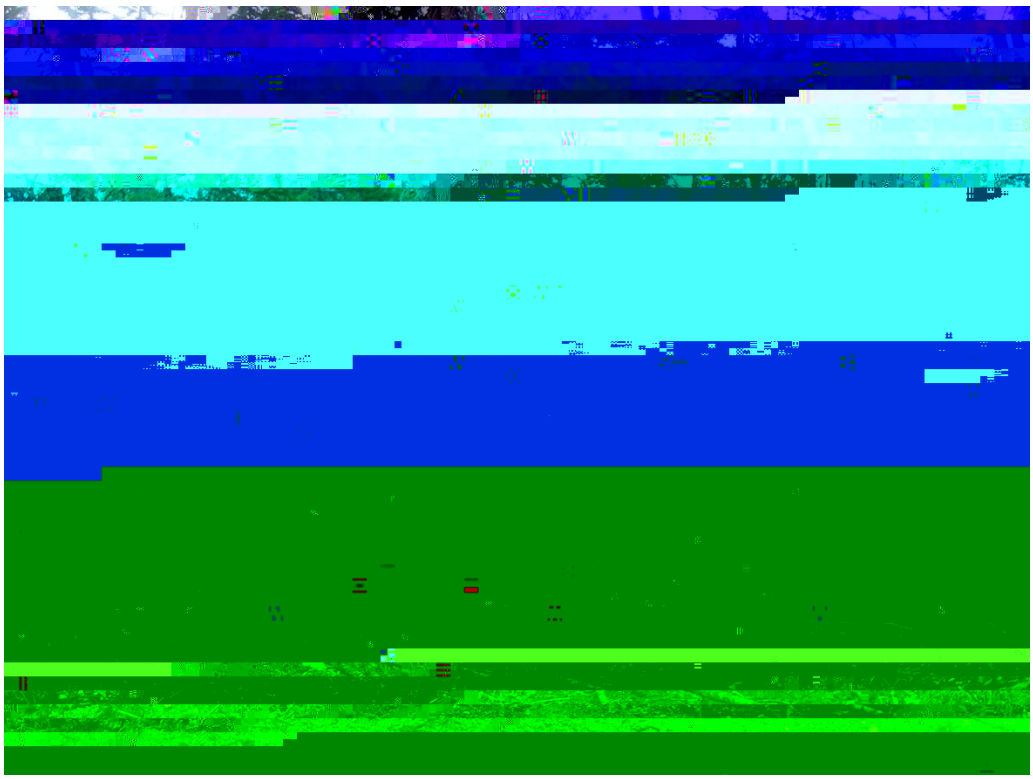
Source water protection is certainly one of the most prominent

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

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



According to the requirements of the ,

(S.B.C. 2002, c. 69), small harvests under this type of permit 8(l fo.27 Ta 0 0 .621 0 0 1 410.86 320

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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 for this objective.

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.

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

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 (a)-3(s d)-5(iscusse

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

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.

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 inform‖location pp sbu; (t)-3(Mo-3

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 for this objective.

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 boardm1(kn)(rom)-7(jETB6(o)-e)-t comg the l

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

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

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

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.

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 for the objective of fulfilling the legal requirements associated with a timber tenure.

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.

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.

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

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

All results indicate that MCF has this objective. In interviews, forest

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.

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 surroun

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.

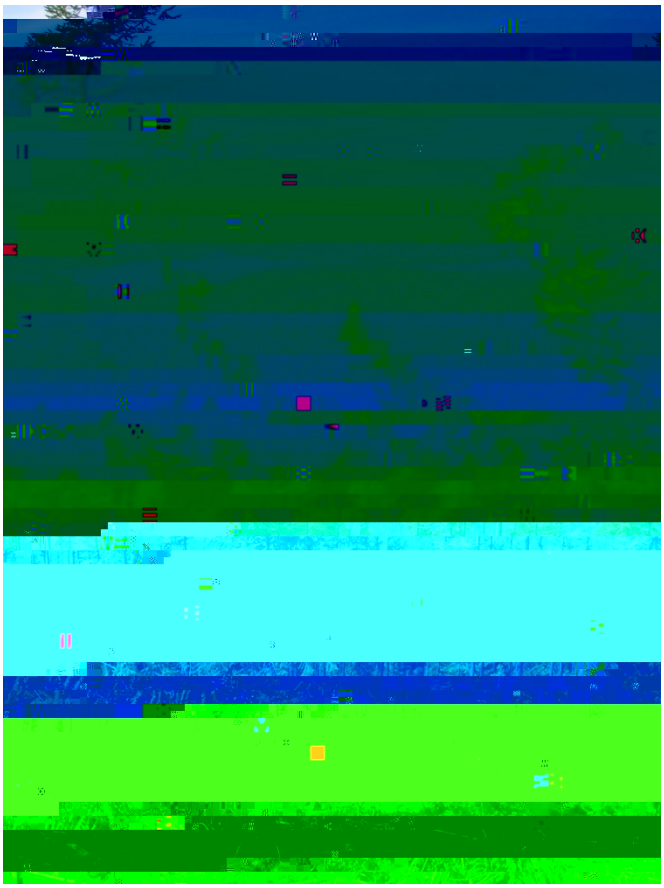
Interview results indicated that because the Creston a

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 6(u[(q)6(u)-3(a)6(u)-3(a)6(o.)-3(ities)6(18710(Fo)-4(rest)-2(id)-3(e)61 0 0 1 89.904

According to forest staff and board members, the main threats to

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.



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 for this objective.

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).

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 speci

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

CCF representatives spoke in interviews of several lessons learned

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

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

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. A

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

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

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

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).

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.

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

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.

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.

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.

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

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.

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.

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

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.

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, spe

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

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, 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

and Creston Community Forests could also distribute SOPs to logging crews in

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.

In the same way that co

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.

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

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

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. I

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

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.

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.

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.

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, nity

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 contribut-5(rs a)4(u694 Tm[(h)-34) v(a)6(t)t Tm[(h)-3(y)o/ifyad

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 , for its three source watersheds and pays only one dollar per watershed, per year, to the Crown (Greater Vancouver Water District, 2002).

If an alternative form of tenure is not possible, the BC government should, at minimum, consider revising the , the , and their associated regulations, to lessen the administrative burden on

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).

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

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).

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:

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 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-fre, ammunity forvele,s mil -11(ow-3(i)12(n)-3(e)-3ar-3(s)10(e)kn8(h)-5(ow-3(i)12(nl)4(t)-3(ol)-

In what ways are you involved with the community forest?

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