



One Size Does not Fit all: Constraints and Opportunities for Small-Scale Forestry in British Columbia, Canada

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Abstract

Forestry in British Columbia, Canada, is in transition. Social and environmental concerns, such as the conservation of old growth forests, reconciliation with indigenous peoples, increasing wildfires, climate change, and tree diseases are driving changes in forest management, production, stewardship, and tenure. Government, industry, and local communities are seeking ways to achieve a resilient, diverse, and innovative forest sector that reflects local and indigenous values. We explore the role of small-scale forestry in contributing to this objective. Drawing from an online survey of small-scale foresters, discussions, relevant literature, and policy documents, we examine the management priorities, definitions of success, opportunities, and challenges of small-scale forestry in British Columbia. We find a wide range of views among survey respondents, but some consensus on key policy and management issues. Small-scale foresters would like to see greater opportunities for diversification, increased revenues, opportunities for partnerships, and the removal of barriers that inhibit innovation and local decision-making. The diverse range of local perceptions demonstrates the richness of British Columbia's forestry communities, and the problems of a one-size-fits-all forest policy. A long-term vision accommodating diverse preferences of small-scale forestry in British Columbia is missing from provincial forest policy. We summarize emerging opportunities for small-scale forestry and the ways in which governments, communities, industry, research institutions, and indigenous rights-holders can contribute towards resilient forest systems.

Keywords British Columbia · Forest Policy · Local Perceptions · Constraints · Diversification · Tenure

Introduction

Located in the Pacific Northwest of North America, the province of British Columbia (BC) in Canada is well known for its longstanding relationship with forests. Indigenous and non-indigenous communities interact with forests in a myriad of ways – for spiritual needs, recreation, biodiversity and ecosystems services, education, employment, and revenues from forest products. In a province that is 94% Crown land under control of the provincial government, it has been difficult to manage diverse, conflicting, and changing societal values of forests. The overriding objective of harvesting timber to produce commodity lumber for economic gain has dominated provincial forest policy since the beginning of the 20th century (Cashore 2011; Haley and Nelson 2007). Institutional arrangements designed for commercial exploitation led to early concentration of economic influence in large forest companies, giving rise to concerns over a lack of competition and inadequate silvicultural and poor forest management practices (Hagerman et al. 2010; Peel 1991; Sloan 1945). Despite various attempts at reform, including five Royal Commissions, efforts to address these concerns have struggled to confront deep-rooted problems stemming from historical tenure arrangements and a focus on timber (Mitchell-Banks 2000). Indigenous peoples, industry, and environmental groups have all expressed dissatisfaction with the current situation in BC forestry. Frustrations revolve around the lack of public engagement, a culture of top-down control, and a failure to adapt to emerging needs to address climate change, cultural values, and fire management (BC First Nations Forestry Council, 2021; Catanoso, 2020; Truck Loggers Association, 2021). Improved subsidiarity, public participation, learning, and adaptation are urgently needed to develop policies, tenure, and practices that support inclusive and locally adapted forest stewardship for multiple societal values.

Aspiring to balance social, economic, and environmental values, small-scale forestry has slowly emerged across BC as a means to provide more local benefits from forest management (Ambus et al. 2007a). For many individuals, local communities, indigenous peoples, and small businesses, small-scale forestry offers a way to (re-) establish relationships with forests, protecting local values and providing benefits through employment, revenues, and context specific stewardship (BCCFA, 2021; Devisscher et al., 2021; FBCWA, 2020; Pinkerton, 2019). Growing interest in small-scale forestry in BC is somewhat reflected in recent government policy. In 2021, the provincial government released a plan to ‘Modernize Forest Policy’ in BC, with an intent to achieve a resilient, diverse, and innovative forest sector that reflects local and indigenous values (Government of British Columbia, 2021b). Part of this plan includes expanding tenure opportunities for small and medium sized operators, as well as providing more opportunities for diversification into more high value products. The impetus for policy reform is motivated by several converging factors. The outbreak of mountain pine beetle in the 1990s resulted in the loss of over 18 million hectares of pine forest, prompting large-scale salvage logging of damaged trees. In 2017 and 2018, over 2.5 million hectares of forest burned in wildfires, a consequence of poorly conceived fire suppression practices and climate change (Brookes et al. 2021; Government of British Columbia, 2021c). In 2019, the provincial government passed a Declaration on the Rights of Indigenous Peoples Act (DRIPA), establishing

a framework for reconciliation to address prior and ongoing harms to indigenous peoples caused by colonial land expropriation and forest management practices. More recently in 2020, the provincial government conducted a strategic review of 'old growth' forests, leading to the deferral of old growth logging and strengthening of old growth protection. Each of these factors have led to government, industry, and local communities demanding increased diversity of actors in the forest sector and fundamental changes in stewardship in order to support local needs.

As forestry in BC transitions towards improved sustainability, there is a need to consider the conditions that might favour or impede a more diverse, locally driven forest sector. The declining availability of fibre due to political and environmental circumstances is driving major forestry companies to invest outside of BC (Bennett 2021; Jang 2022). Recent studies suggest that small tenures in BC contribute to sustainable forest management, rural economic development, and ecological resilience (Cathro et al. 2007; Devisscher et al. 2021; Furness et al. 2015; Smith and Bulkan 2021). However, globally, the capacity of small-scale forestry to achieve broader sustainability objectives depends on conducive institutional arrangements (Mayer 2019; Nijnik et al. 2009; Smith et al. 2006). Understanding management priorities, connections to high value products, perceptions of success, opportunities, and challenges can help to ensure initiatives and future policies intended to support small-scale forestry align with on-the-ground realities and are based on evidence. In this paper, we use the term small-scale forestry to include various types of small tenures, acknowledging the breadth of tenures and management types that exist in BC. We draw on global understanding of small-scale forestry, which is distinguished from industrial forestry but not universally defined (Harrison et al. 2002). We seek to answer (a) what are priority management objectives for small tenure holders, (b) what do small tenure holders consider as successful small-scale forestry and what inhibits success, (c) what opportunities exist for achieving the objectives of small tenure holders as part of a healthy forest sector. Our intention is to identify the potential and constraints confronting small-scale forestry in BC, and the ways in which decision-makers might learn from this information to establish conducive and durable policies.

Small-Scale Forestry in British Columbia

In British Columbia, forest tenures are administered by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) to provide private companies, communities, and individuals the right to harvest timber from crown land. Historically, the allocation of forestry tenures was motivated by the drive for economic expansion, reflecting the development strategies of the late 19th and early 20th century (Government of British Columbia, 2012). Over time, the tenure system has evolved in response to changing political and economic conditions, intended to support local economies and different timber harvesting needs. Today, forestry, as governed by the province, is still primarily concerned with timber as a commodity resource. Several different types of tenure exist in the form of agreements, licences, or permits. The amount of timber that can be harvested by each tenure is determined by the provincial government, referred to as an Annual Allowable Cut (AAC). The

AAC is measured in cubic metres and calculated based on assumptions on the sustainability of harvesting, including the condition of the forest and growth rate and other resource values (Government of British Columbia, 2022c). Over a dozen forms of tenure exist, primarily comprised of volume-based and area-based tenures. A volume-based tenure gives licensees the right to harvest timber within a specified Timber Supply Area (TSA), where the province retains most stewardship responsibilities. Area-based tenure licenses are allocated for a specified area for harvesting and are require the licensee to prepare a long term forest management plan covering all forest operations and post-harvest treatments (Government of British Columbia, 2012).

Ambus et al. (2007a) describe the evolution of small-scale forestry in British Columbia beginning with the first small individual and community-owned tenures in the 1950s. These early small tenures included farm woodlots, providing timber harvesting rights to farmers and ranchers, and the first Tree Farm Licence (TFL) granted to a municipality, the District of Mission in 1958 (District of Mission, n.d). In the years that followed, the rationale for smaller tenures increasingly reflected societal demands for improved environmental stewardship. Environmentalists wanted greater protection, forest industry workers wanted secure employment, and regional communities wanted control over their local resource base (Taylor and Wilson 1994). Reconciling these interests formed the basis for small-scale forestry in BC. Tenures are now expected to reflect local priorities, generate local benefits, support local industries, and enable management for multiple values.

Today, there are three main area-based tenure categories in BC that are conducive to small-scale forestry: Woodlot Licences, First Nations Woodland Licences, and Community Forest Agreements (CFA). The woodlot licence program was established in 1979, following the farm woodlot program. As of writing, there are 843 woodlot licenses. In 1998, the province began to trial community forestry, and this was officially established in 2004. Since 1998, 61 CFAs have been issued with four in the application process (Government of British Columbia, 2021a). In 2011, the province established First Nation Woodland Licences, intended to support increased First Nations¹ participation in the forest sector. The FNWL is an area-based tenure that allows tenure-holders to align forest management with Nation values and traditional practices. The province has issued 24 First Nation Woodland Licences. Key characteristics of small tenures and AAC allocations are summarized in Table 1.

Woodlots, CFAs, and FNWL make up most of the small-scale forestry sector in BC, representing just 7% of the total provincial AAC². Other tenures, such as area-based TFLs and volume-based licences that are typically held by major companies are sometimes smaller in size and may be managed by local communities, First Nations, and local businesses. The provincial government also provides timber harvesting rights to small-scale operators through its agency BC Timber Sales, which makes public timber available to harvest through competitive auctions. These harvesting rights are called BC Timber Sales Licences and have different management requirements from forest tenures. Since 1988 approximately 1 million hectares of pri-

¹ In Canada, the term Indigenous peoples refers to First Nations, Métis, and Inuit peoples.

² Calculated as a percentage of total provincial AAC including TFLs, TSAs, CFAs, FNWLs, and Woodlots (Government of British Columbia, 2022b).

Table 1 Small-scale forestry on crown land in BC: Main tenure types and characteristics (Government of British Columbia, 2022b)

Tenure type	Number issued	Size range (ha)	Average AAC (m ³)	Total land cover (ha)	Total cubic metres (% of provincial AAC)	Right to harvest timber	Rights to botanical forest products [†]
Woodlot Licence ^{††}	843	0 to 2,681.9	1,700	577,908	1,432,775 (2.2%)	Exclusive, area-based, 20 year term replaceable every 10 yrs.	None
Community Forest Agreement	61	361 to 184,682	37,900	1.91 million	2,273,998 (3.4%)	Exclusive area-based, 25 year term replaceable every 10 yrs.	Right but not exclusive
First Nations Woodland Licence	24	797 to 3,220,663	43,598	4.07 million	1,046,343 (1.6%)	Exclusive, area-based, 25 year term replaceable every 10 yrs.	Right but not exclusive

[†] Botanical forest products are non-timber-forest products (described as botanicals in government legislation)

^{††} Includes timber harvested from private and crown land

vate forest land has been classed as managed forest. Forestry activities also take place on Indigenous reserves and treaty settlement land, including some small Indigenous-owned operations that do not fall into the categories of provincial forestry tenures.

Forestry tenures in BC are held by various actors, including individuals, businesses and incorporated companies, community-based legal entities, First Nations, municipalities, and partnerships. One entity may hold multiple tenures and the situation is constantly changing. Despite growth in small-scale forestry, approximately 40% of the provincial AAC is still held by five major companies, each with an AAC over 3 million cubic metres (Government of British Columbia, 2022a). In this paper, we focus on small tenures, acknowledging that small-scale forestry is part of a forestry system that should deliver broad benefits at multiple scales. We aim to increase understanding of what it means to practice small-scale forestry in BC, and to identify the enabling conditions that might allow small tenures to thrive.

Methodology

Conceptual Framework

The current situation of forestry in BC is driving new policies and practices, intended to enhance the sustainability and resilience of the forest sector through diversification. Increasing the diversity of actors and tenure-holders in BC requires learning from current actors involved in small-scale forestry in BC on their perceptions of priorities, success, challenges, and opportunities. Globally, small-scale forestry is recognised for having '*multiple objectives, encompassing a range of social, environmental and economic objectives which are unique to each small-scale forester*' (Herbohn 2006). The sustainability of these small-scale forestry systems depends

on how these objectives are balanced and prioritized, acknowledging that there are likely trade-offs between values. As such, our approach to learning focused on perceptions; how individuals observe, understand, interpret and evaluate experiences, actions, policies, and outcomes (Bennett 2016; Munhall 2008). Understanding perceptions can help to gain insights on likely responses to new and existing policies to enable their fine-tuning (Bennett 2016; Castillo et al. 2021; Gelcich and O’Keeffe 2016). A stronger understanding of how small-scale foresters perceive success and constraints can enrich dialogue between government and society, aiding the development of sound policies that respond to the needs of tenure-holders. In BC, small tenures are expected to deliver economic, environmental, and social benefits in ways that reflect local goals and priorities (Ambus et al. 2007a). Past studies of small tenures in BC have highlighted the importance of locally developed understandings of these benefits, linking sustainability to local values and context (Assuah et al. 2016; Spies et al. 2019). In this paper, we build from past research and take a bottom-up approach, focusing first on perceived opportunities and constraints, followed by an inquiry into how BC forest policy might be adapted to sustain a healthy forest sector.

We took a three-pronged approach to gathering information. First, to maximise contributions from different actors, we conducted an exploratory survey, inviting small tenure holders to participate. The voluntary online survey allowed for an overarching understanding of individual perceptions of small-scale forestry (see appended survey). Second, to complement the survey, we conducted in-depth discussions with actors involved in small-scale forestry through phone-interviews and face to face meetings. Third, to enrich the picture, we reviewed grey and peer-reviewed literature and government resources on forest policy and legislation. Our methodology was informed by qualitative research in social-ecological systems (Biggs et al. 2021; Newing 2010); further detail is provided below. This study is part of a broader research program that seeks to increase people’s prosperity and encourage broad sustainability outcomes in forest landscapes.

Survey

The online survey was conducted from May to August 2021. Survey questions covered management priorities, understanding of successful small-scale forestry, inhibitors to success, future opportunities, and some basic identity questions. The survey comprised 16 questions, including 10 questions on tenure characteristics and participant identity and 6 questions to elicit perceptions. Perception questions included Likert scale estimates of management priorities and constraints, three related questions on wood manufacturing, two open-ended questions on conceptions of successful small-scale forestry and opportunities, and one question on perceived dependence on major forest companies. The survey was designed following previous studies exploring characteristics of small-scale forestry. The set of management priorities was adapted from Wiersum et al. (2005), established as part of a comparative survey of small-scale forestry characteristics in eight European countries. Survey respondents were asked to rank management objectives as high, medium, or low priority. Rather than define successful small-scale forestry *ex ante*, we asked the open-ended question ‘*In your opinion, successful small scale forest is:*’ and then asked participants to

select from a list of constraints that prevent success. The list of constraints was built from Herbohn (2006) and adapted to the current BC context.

To build a richer picture of small-scale forestry in relation to the broader forestry industry in BC, we asked participants about secondary wood manufacturing, adapting questions from the British Columbia Community Forest Association (BCCFA) indicators report (BCCFA, 2021). The motivation to include this question was a lack of recent studies on the relationships between small tenures and secondary wood manufacturing (Ambus et al. 2007b). The survey was distributed through small-scale forestry networks with support from the Federation of BC Woodlot Associations (FBCWA), the BCCFA and Association of BC Forest Professionals. The survey was sent to the FBCWA for review prior to distribution. Invitations to participate in the survey were posted in newsletters and emailed to forestry companies and tenureholders with an annual harvest under 100,000m³. The upper limit was based on the BC provincial government classification of independent medium licences (<AAC 100,000 m³) but not strictly applied as some CFAs and FNWLs can have a larger AAC.

Overall, we received 87 responses, with 70 respondents completing all questions, and 78 completing 94% of questions. Survey respondents represented a diversity of tenures, primarily woodlots (53%) and community forests (25%) (Table 2). Some respondents reported holding multiple licences within their forestry operations. The minimum annual harvest is 460m³ and the median is 4,100m³. Four respondents reported an annual harvest over 100,000m³ and we include these in our analysis. Approximately 60% of licences are held by a corporation, municipality or non-profit, 23% are held as partnerships, and 18% are sole proprietorships. Respondents included indigenous and non-indigenous tenure holders. Most respondents (84%) reported having fewer than 5 employees. Some respondents (16%) operate a wood manufacturing facility producing commodity and secondary products. Half of the respondents are over the age of 60yrs and most respondents reported more than 10 years' experience in forestry-related activities. Respondents have been operating their tenures for various lengths of time over the past 40 years, with some beginning earlier than 1985. Respondents are located across most natural resource districts,

Table 2 Tenures held by survey respondents

Tenure type	Number of respondents
Community Forest Agreement	22
Forest Licence Non-Replaceable (FLNR)	3
Forest Licence Replaceable (FLREP)	6
Forest Licence Replaceable First Nations (FLRFN)	2
Non-Replaceable Forest Licence First Nations (FLNRFN)	2
Tree Farm Licence (Area)	3
Woodlot Licence	46
Schedule B (Crown land)	25
Schedule A and Schedule B	19
NA	2
Other	3
Total	87

with 36% located in the coastal area of BC, 36% in the Southern interior, and 28% located in the Northern interior of BC.

Discussions and Observations

We sought to understand the broader context for the survey and focus on key issues by holding formal and informal discussions with actors involved in small-scale forestry. These included discussions with woodlot licence-holders, managers of community forests, small business owners, managers of private forests, and researchers. Discussions focused on key themes that arose from the online survey, as well as reactions to the provincial government's release of the *Modernizing Forest Policy in British Columbia* in 2021, which states intentions for future policies and practices for the forest sector (Government of British Columbia, 2021b). Discussions took place on a rolling basis, following the principle of saturation (Glaser 2006). Initially, respondents contacted authors to provide context for survey responses. The authors then targeted additional survey respondents with different attributes to widen perspectives. This included expanding research questions in a contextual setting (i.e. attempts to incorporate Indigenous values into management), and clarifying issues raised in the survey, such as economies of scale. The authors also visited several small forestry enterprises over the period 2018–2021, including the Cariboo-Chilcotin district, Quesnel, Okanagan Shuswap, Sea to Sky, Chilliwack, and South Island. During these visits, researchers spoke with forest managers on local values, challenges, perceptions of provincial policy, and social, economic, and environmental changes. Researchers observed operations to develop recreation, harvesting techniques to retain habitat for wildlife, wood processing, and old growth management, further grounding the results in tangible experiences.

Analysis

Data analysis focused on triangulation between survey results, discussions, grey and peer-reviewed literature, and government resources on forest policy and legislation. First, survey responses to Likert-scale questions were converted to scores and (3=high priority/significance, 2=medium, 1=low) and descriptive statistics were calculated in SPSS v.29 (2022). Open ended questions were analyzed qualitatively and coded using NVIVO Release 1.7 (QSR International, 2022). Using an iterative and inductive approach, codes were generated whilst examining the data, by capturing key phrases and words under themes and sub-themes (Newing 2010). Perceptions of success were coded into 14 themes, which were then reviewed by researchers and organized into four groups: functions, approaches, perceptions, and values. Comments on opportunities were coded with open-ended responses to constraints, identifying several themes including networking, diversification opportunities, and expanding markets for fibre, tenure diversification, removing bureaucratic barriers, and addressing the power imbalance between small tenures and major companies.

As a voluntary online survey, the survey data cannot be considered representative of all small-scale forestry tenures in BC. Whilst all small tenures and regions were represented, the survey was limited in terms of number of respondents and access

to respondents involved in associations or with online access. Acknowledging these limitations, survey data was analyzed in conjunction with discussions, literature, and publicly available association surveys, including the BCCFA annual indicators report and FBCWA annual wood licensee survey (BCCFA, 2021; FBCWA, 2021). Constraints and concerns identified by survey participants were cross-checked with concerns raised in the FBCWA licensee survey. Survey responses were validated through discussions, as well as obtaining complementary data from BCCFA indicator reports, online resources, including peer-reviewed journal articles, policy documents, reports, press releases, and webinars. Discussions and observations allowed for nuanced interpretation of results, linking the perceptions of tenure-holders to context and current opportunities and constraints of forest policy. Building on salient themes that emerged in the survey, iterative analysis led to seven key priority areas for identifying enabling conditions for small-scale forestry in BC, discussed in Sect. 4. The study was covered by ethics approval from the University of British Columbia (H19-01864).

Results and Discussion

Key Findings

Across all discussions, survey responses, and additional resources reviewed, we found both a diversity of perceptions among small-tenure holders, but also broad agreement on key policy and management issues. Diversity is apparent in the different values held by owners of small-tenures and surrounding communities. These were expressed through management objectives, conceptions of success, and perceived opportunities. The challenges of balancing objectives such as recreation, environmental protection, research, traditional and cultural practices, community well-being, support for local enterprises, and many other values were raised by survey respondents and in discussions. Despite this diversity, we observed consensus in our sample of perceived over-arching challenges for small-tenures; that small-tenures face unique challenges due to their size, and that more decision-making power should lie in the hands of tenure-holders to overcome challenges and manage for diverse interests. The following sections report upon survey results, followed by a broader discussion on creating an enabling environment for small-scale forestry in BC.

Management Priorities

Results from the survey show that respondents manage for a wide range of objectives within the same tenure (Fig. 1). These objectives may reflect personal or community values, as well as the social, economic, and environmental needs of the licensee and landscape. A comparison of mean scores showed that priority objectives across the entire sample are (i) natural resource protection, (2.69) and (ii) income generation from wood production (2.66). Past studies have also documented the priority small tenures place on environmental stewardship, such as investing in enhanced management of sensitive areas, watershed health, and old growth (BCCFA, 2021; Devisscher et al., 2021). Yet many other objectives rank as high and medium priority, including

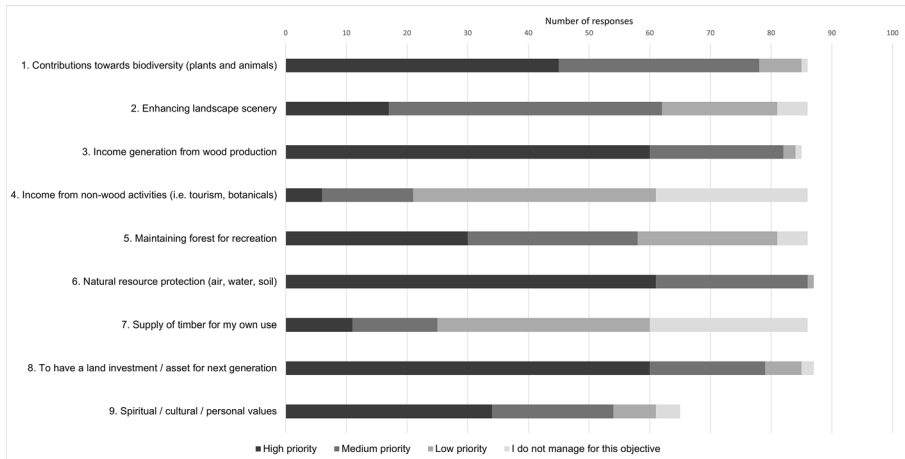


Fig. 1 Small-scale forestry management priorities in BC. Respondents ranked items 1–8 as high, medium, or low priority. Item 9 was added based on early responses

having an asset for future generations (2.57), and conserving biodiversity (2.42). In addition to the pre-set list of objectives in Fig. 1, respondents noted that fire, climate change adaptation, education, research and innovation, contributions to community, improving timber values, and broader integrated sustainability of forests were also priority management objectives. The least common management objectives were managing forests for a personal supply of timber and generating income from non-wood activities. These findings are consistent with previous studies of small-scale forestry in Europe that find natural resource protection to be a high priority and income from non-wood activities to be a low priority (Wiersum et al. 2005). The diversity of management priorities is also reflected in global studies of small-scale forestry, highlighting the breadth of motivations and values that influence decision-making and aspirations for forest landscapes (Bengston et al. 2011; Bray et al. 2005; Hajjar et al. 2011; Hugosson and Ingemarson 2004).

Connections with Secondary Wood Product Manufacturing

Diverse interests of small-tenure holders were also reflected in preferences for engaging with secondary wood manufacturing. Wood product manufacturing in BC can be broadly grouped into commodity products and secondary manufactured products. Commodity products include lumber, plywood, pulp, pellets, oriented strand board, particleboard, and medium-density fibreboard³. The secondary manufacturing sector typically includes remanufactured products, millwork, engineered wood products (including log homes and timber frames), cabinets, furniture, pallets and containers, other wood products, shakes and shingles, and panel boards (Wong et al. 2019). We asked survey respondents whether they are satisfied with the volume of their wood

³ Commodities such as lumber, plywood, and pulp can be considered value-adding or secondary if differentiated.

supply that ends up in the secondary wood manufacturing sector. Out of 78 responses, 32% reported they were dissatisfied, 22% reported they were satisfied, and 46% said they were neutral, with varied perspectives both across and within regions. Dissatisfied respondents were asked to select reasons for dissatisfaction, with an option to enter addition concerns. The most common reason for dissatisfaction was lack of proximity to secondary wood manufacturers (43% of dissatisfied respondents), followed by accessibility (difficulty entering supply chains) (29%), market instabilities (26%) and high cost (3%). Concerns identified by respondents include the viability of selling directly to secondary manufacturers, such as sporadic demand for specific material, access to commercially viable stands, and small profit margins. In addition, respondents raised the issue of a lack of a developed network linking small-scale foresters with secondary wood manufacturers, including value-chains, supporting infrastructure, and pro-active cooperation. These results raise questions over the degree to which diversification in tenure will enable the development of high-value markets in the current policy environment – an issue that needs attention in forest policy development.

Perceptions of Success

Survey respondents identified a wide range of characteristics that define successful small-scale forestry. Many of the characteristics overlap, referring to values – what is important to respondents, perspectives – respondent beliefs, approaches – ways of operating or managing, and functions – the purpose or intention of small-scale forestry (Fig. 2). The most common characteristics of successful small-scale forestry identified by respondents were balancing values, holistic benefits, profit, and support for the local economy. Yet many other responses emerged: strong understanding of the land, using small volumes to create high quality products, maintaining legal obligations, and remaining small enough to be flexible and innovative. Respondents

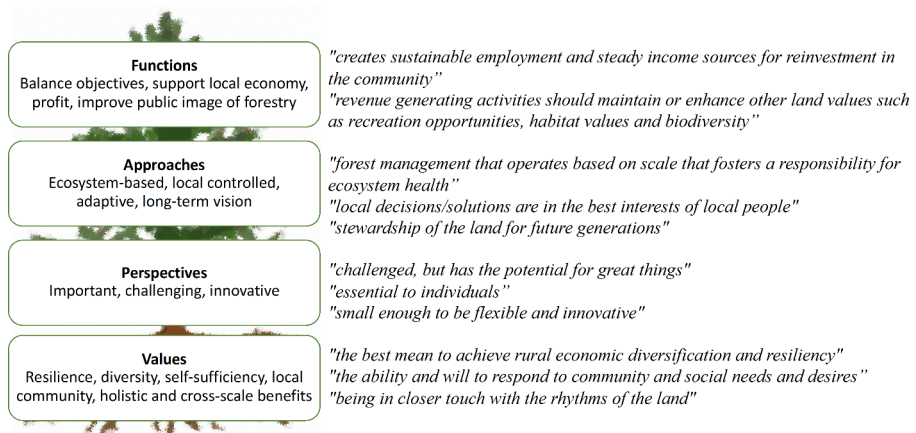


Fig. 2 Perceptions of successful small-scale forestry. Survey respondents identified a wide range of characteristics that included functions, approaches, perspectives, and values of small-scale forestry

characterize successful small-scale forestry as much more than managing forests for timber production. The ability to adapt to local values, deliver multiple benefits, and manage holistically for future generations appear to be principles for many small-scale foresters. Follow-up discussions with respondents suggested that the goals of forest managers go beyond those included in the government licensing agreements, such as prioritizing ecological or recreational values over timber. For other respondents, success also includes benefits gained from the forest for the community, such as revenue for local government, employment, and other forms of community support.

Constraints and Policy Gaps

The survey results above demonstrate that among the sample, small-scale foresters share similar goals of holistic stewardship and adaptive management, but also hold a wide spectrum of aspirations. According to mean scores on the perceptions of constraints to successful small-scale forestry, respondents ranked economies of scale as the most significant constraint (2.32), followed by limited devolution of power to make strategic planning decisions (2.18) (Fig. 3). The issue of economies of scale is mainly a result of dominance of commodity lumber in British Columbia, where public policies and capital investments favour large-scale production. In addition to common constraints, respondents identified a wide range of concerns specific to small-scale forestry in BC. Concerns included high administrative demands and bureaucracy, over-regulation restricting management and innovation, power held by large-scale licence holders, problems with the timber pricing system, lack of skilled labour, lack of capital, fibre quality, access to contractors, communitarianism (lack of individual autonomy), and a lack of a cultural and ethical environment for small-scale land stewardship. In discussions, forest managers echoed these concerns, describing how politics and bureaucracy create hurdles for small-scale foresters, inhibiting their ability to manage for local values and ecological resilience.

Many of the concerns raised by survey respondents relate to forest policy in BC. Greater local participation in forestry in the form of small tenures should allow for

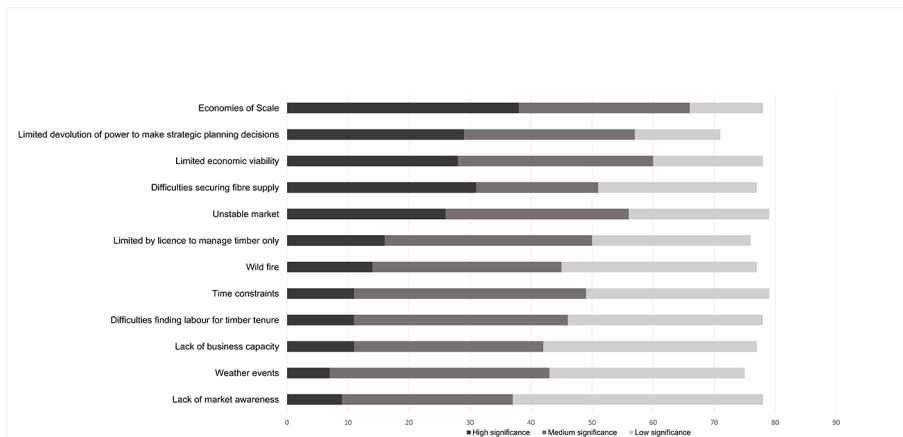


Fig. 3 Constraints of small-scale forestry identified by survey respondents

forest management to provide for local values and exploit local knowledge, thus, allowing forest managers to incorporate new approaches (Furness et al. 2015; Pinkerton et al. 2008). However, current provincial forest policy appears to be an obstacle to flexibility and adaptation in meeting the diverse needs and aspirations of small-scale foresters. Small-scale foresters are limited in their authority to make strategic planning decisions and are concerned by the regulatory burdens that exist for small tenures. The results indicate that small-scale foresters feel constrained by the organization of the BC forest sector. As described by one respondent, “*government policy is geared towards large scale forestry*”. Several initiatives exist to support small-scale forestry, predominantly led by the BCCFA and FBCWA. In discussions we learnt that these initiatives are highly valued but still are limited in their capacity to confront the complex challenges that result from a century of industrial forest policy. Without enabling policies that allow for local decision-making, networks, and innovation, small-scale forestry is not able to fulfil its potential.

Creating an Enabling Environment for Small-scale Forestry

Supporting successful small-scale forestry aligns with the provincial government’s intent to strengthen the forest sector to better reflect local and indigenous values. The intent to modernize BC’s forest sector offers a platform for addressing some of these concerns, but a long-term vision of small-scale forestry beyond timber sustainability in BC is needed. Creating the enabling conditions for success requires policies, legislation, and capabilities that reflect the concerns and interests of existing small tenureholders as part of a healthy forest sector. Municipalities, businesses, non-government organizations, and research institutions can help to create space for local forests to trial management, stewardship, and business ventures that support social, cultural, economic, and environmental needs. Below, we draw from survey responses, discussions, and additional resources to consider seven priority areas to create opportunities and remove barriers for enhancing small-scale forestry as part a resilient, diverse, and innovative forest sector in BC.

Forest Tenure Diversification

There was an overwhelming call among survey respondents to award more small tenures in BC and enable the expansion of existing tenures in number and size. Respondents gave multiple reasons for expanding small tenures: more wood available to secondary wood manufacturers, enhanced fibre utilization, and the benefits of more control and value held within local communities. Expanding the size of small tenures would also help to address the problem of economies of scale, identified by survey respondents as key constraint of small-scale forestry. However, decisions on expanding small tenures should be made inclusively with all stakeholders, with full understanding of trade-offs. The provincial government recently introduced new legislation to redistribute tenures and provide communities, smaller operators, and First Nations with more access to fibre. Tenure reform, despite strong arguments, is not a panacea for addressing the problems of BC forestry (Ambus and Hoberg 2011; Haley and Nelson 2007; Niquidet 2008). To support a healthy forest industry, expansion

of small tenures must be managed carefully, establishing optimal arrangements for flexibility, diversity, and adaptive capacity (Kant 2009). Diversifying forestry tenures encourages First Nations, local communities, and industry to strategically develop partnerships and business models suited to local needs. Community-based or local ownership need not mean ‘small-scale’; larger operations can be governed in ways that still set priorities and deliver broader sets of values (Wyatt et al. 2013). Developing relationships and trust between mill operators, major licensees, and small tenure holders will be key to ensuring new arrangements address concerns of stakeholders and build capacity for change. As highlighted by one woodlot licence holder, “*Small-scale forestry cannot succeed unless it is part of a larger industry. But it does need incentives in order to survive and thrive*”.

Expand Opportunities for Stewardship and Revenue

The survey results indicate that small-scale foresters prioritise diverse value of forests, but many feel limited in their power to maximise benefits from these values. Current regulations are based on meeting broad government objectives. However, regulations have not kept pace with the diversity of objectives and values in small-scale forestry. As shown by Devisscher et al. (2021), small-scale foresters are seeking to better manage their forest for climate resilience, through silvicultural strategies, long-term monitoring, modifying species and adapting stocking standards. Currently, management of this kind requires submitting special requests for approval, as stocking standards tend to focus on trees that are not climate adaptive, and managing for drought, flood, and wildfire can clash with requirements for visual quality and adjacency to previous cut blocks (Leslie 2021). Foresters managing for old growth values encounter similar discrepancies between provincial regulations and actual forest conditions (Gorley and Merkel 2020). Recent evaluations of old growth forest policy show that designated Old Growth Management Areas (OGMAs) are dominated by younger forests, whilst only a quarter of high productivity old growth (stands that support larger trees, high heterogeneity and high biodiversity) is protected (Price et al. 2021). Some communities, such as West Bank First Nation, have developed old forest stewardship zones that reflects locally developed values, goals, and principles, which are different to the old growth management prescriptions set by the province. It is not yet clear how local stewardship plans will be recognised in the provincial government’s Modern Old Growth Strategy for BC.

Small-scale foresters would also like opportunities to manage a diverse portfolio of activities to support their forestry operations and communities. Survey respondents expressed interest in growing opportunities for recreation, research and education, non-timber forest products and biodiversity. Currently, licence-holders are restricted in the ways they generate revenue from these activities. Commercial recreation is governed by the Land Act, requiring tenure-holders to obtain a separate permit to setup new recreational services on their tenure. The Community Forest Agreements and First Nations Woodland Licences allow for the harvest and management of botanical products. However, policies for botanical forest products are largely absent and even if included in the management plan, the licence-holder does not have exclusive rights (MFLNRORD, 2019; Mitchell et al., 2010). In discussions,

forest managers reported difficulties in managing the trade-off between the cost of sustaining holistic management practices and the profit needed from timber production. There are currently no incentive or reward schemes for the protection of biodiversity or cultural values through holistic ecosystem-based management, which is often more costly (Smith and Bulkan 2021). Timber is still the priority resource in forest tenures.

“Until recently, in riparian areas, forest managers were required to manage for biodiversity and water quality ‘without unduly reducing the timber supply’ (Hoberg and Malkinson 2013)”.

Whilst our survey findings show timber production is still a high priority for small-scale foresters, many feel the need to have more authority in balancing timber harvesting with other revenue alternatives. In discussions, tenure-holders indicated interest in developing legislation for botanical products, which could lead to regulation of other goods and services, such as carbon or ecosystem services. Policies and legislation that recognise and incentivize management of non-timber values could help to support holistic stewardship, revenue streams, employment, and community engagement in forestry.

Investment in Innovation and Removal of Barriers

Survey respondents expressed a desire to allow more innovation on small-scale tenures. One woodlot licence-holder commented that “*small-scale forestry is the perfect platform to try out new management methodology*”. Yet many feel limited by the government on what they can try. Current forest policies allow companies to innovate, provided results are consistent with the government’s objectives for forest management. The rationale for innovation must be made clear by the tenure holder and attached to a Forest Stewardship Plan submitted to the forest district. The innovation strategy or result must be verifiable or measurable and consistent with government objectives and requires approval from the forest district. This approval process limits innovation and trials and is perceived to be difficult and cumbersome (Forest Practices Board, 2015). Forest companies prefer to stick with default practices set by the government, viewing the development of alternative practices to be “onerous, time-consuming, and costly” (Hoberg et al. 2016). For small-scale foresters that already feel burdened by administrative responsibilities, the bureaucratic requirement for innovation reduces opportunities for adapting and learning from local practices.

“*A less confusing and onerous system that’s consistently applied across all woodlots could inspire and facilitate better solutions*” (Woodlot licence holder, Cariboo-Chilcotin District).

Several respondents noted they would like to see more investment in innovation. For example, there is interest in selective harvesting systems but available data on appropriate strategies for local conditions is limited (Beese et al. 2019; Simard et al. 2020). More involvement of small tenures in silvicultural trials can not only improve management practices for biodiversity and carbon but also allow licence-holders to engage in dialogue about benefits and trade-offs of different harvesting intensities

with other values. Given the resource constraints on district forestry offices, these types of initiatives could contribute to the development of adaptive forest policy grounded in local innovation (Lawrence 2017). At present, it appears policy is lagging behind small-scale innovation, signifying a need for closer links between local initiatives, research, and government (Innes 2003).

Enhancing Fibre Utilization

The provincial government's intent to Modernize the BC Forest sector includes interest in developing more diversified manufacturing, focused on value rather than volume. The survey results indicate there are varied perceptions on this issue among small-scale foresters. Whilst many are satisfied selling to commodity producers, several commented on the need for more secondary markets, small mills, and opportunities to engage directly with smaller wood manufacturers. Recent studies of secondary wood manufacturing in BC have shown labour and wood supply to be major constraints to growth (DeLong et al. 2007; Grace et al. 2018; Wong et al. 2019). There are many factors that influence wood supply for secondary wood manufacturing; species mix, fibre quality, location, proximity to small mills and manufacturers, size of operation etc. But there is very little documented on the supply chains for high value firms; the majority of fibre (89%) is sourced from the BC market (Wong et al. 2019). Case studies reveal that secondary wood manufacturers that buy wood from tenure-holders or primary manufacturers tend to have long-term, secure, stable relationships with suppliers (Grace et al. 2018; Hanna et al. 2017). In discussions, we learned of several small tenure-holders seeking to develop local manufacturing capacity. In the Boundary-Kootenay area, small-scale foresters are conducting research with local mills to strengthen the value-added sector, identifying optimal use of species, training needs to develop harvesting techniques and the potential for collaborative business models (Hodgkinson and Oldham 2022). The Lil'wat Nation is currently exploring wood products that emphasize Indigenous culture and knowledge in forest management. Localized knowledge of existing resources, training needs, and credible opportunities will be essential to closing gaps and targeting investment.

Enhancing fibre utilization can also include a range of activities other than high value manufacturing. Survey respondents would like to see more opportunities and support for small-scale salvage and residual fibre use, with benefits for wildfire management, pest control, reduced greenhouse gas emissions, and economic returns. The Forest Enhancement Society of British Columbia (FESBC) has provided grants to support the removal of residual waste wood fibre to reduce the cost of transporting wood to be chipped at pulp, pellet, or energy facilities. Obtaining grants and achieving desired objectives are often the result of collaborative multi-stakeholder partnerships, led by a diversity of actors. The Village of Fraser Lake Community Forest noted that FESBC funding for fuel reduction has been essential to their operations, enabling strong stewardship over a small tenure. Other tenure-holders have installed biomass heating systems, such as the Esk'etemc community in Alkali Lake. However, without proactive initiatives and external funding, there is little incentive to innovate and utilize fibre residue, often resulting in wasteful practices (Aeyelts et

al. 2022). Greater financial and political support is needed to create opportunities for cost-effective biomass utilization.

Networking and Cooperation

Many of the challenges and opportunities for small-scale forestry relate to the interactions among forestry actors. Comments raised in survey and recent FBCWA woodlot licensee surveys indicate common concerns over a lack of responsive and constructive communication from the provincial government (FBCWA, 2021). These concerns align with a recent review of woodlot management and practices in the Kootenay Lake TSA (Forest Practices Board, 2019). In the survey and in discussions, small-scale foresters highlighted potential benefits of stronger local and regional networks across different forestry actors, including small and large licensees, contractors, manufacturers, municipal and First Nations governments and community groups. Shared information on local contractors, skilled labour, equipment, and marketing would allow tenure-holders greater flexibility in management and harvesting. For example, survey respondents expressed interest in selective logging on range tenures or small-scale salvage operations, which require contractors with specialized equipment and skills. The BCCFA has been essential to supporting a network of community forests through information sharing, advocacy, and a wide range of education and extension services. The FBCWA provide similar support to woodlot licences. Studies have shown the contributions of small-scale forestry networks to learning, providing services, communication channels during timber sales, and understanding best practices in the local context (Guillén et al. 2015; Korhonen et al. 2012; Ruseva et al. 2014). There is significant potential to expand local forestry networks in BC to provide services, access resources, and build relationships. For example, the City of Prince George recently developed a Forestry Cluster Development Strategy, bringing local businesses together and collecting data to explore opportunities for growth (City of Prince George, 2021). In Quesnel, the Forestry Initiatives Program is working closely with industry, local universities, and small businesses to identify regional training needs across the entire forestry value chain. Municipalities are well-positioned to act as convenors in these initiatives, accessing funding, linking actors, and advocating for regional priorities at provincial and national forums.

Reconciliation

The path forward for Indigenous reconciliation in the forest sector is expected to take many forms. DRIPA opened the potential for tenure reform, revenue sharing, land-use planning, shared governance, and greater Indigenous employment in forestry. As part of future opportunities for BC forests, respondents noted the positive steps towards reconciliation, as well as the uncertainties that currently exist due to tenure reform. Survey comments expressed a desire for careful consideration in the design of new strategies and governance structure that draws from past experience (Nelson et al. 2019; Nikolakis and Nelson 2015; Smith and Bulkan 2021; Trostler et al. 2008). In our correspondence and discussions with First Nations tenure-holders, forest managers emphasized that the problems facing the forest industry cannot be separated

from the broader history of BC and Canada. Colonization severed the relationship Indigenous people had with their natural capital. Self-determination may be restored through healing, reconciliation initiatives, and the gradual building of greater trust (Anderson et al. 2004; Kirmayer et al. 2011; Ladner 2009). Recognising that this will be a gradual process, many communities are moving forward with locally-driven reconciliation actions, with intentions to grow and develop partnerships.

The BCCFA indicators report highlights ways in which community forests provide a platform to develop partnerships and increase Indigenous leadership in forestry (BCCFA, 2021). Examples of this include fire management, governance, employment, education and training, and the development of botanical resource strategies. Although the potential outcomes of DRIPA are still uncertain, new attention towards reconciliation provides an opportunity for communities and small tenure-holders to consider the relationships, capacity, and resources that will be needed under alternative tenure arrangements. For example, the Mission Municipal Forest has obtained funding from the Union of BC Municipalities Community Resiliency program to develop an Indigenous Guardians training program. Located on the traditional, ancestral and unceded territories of the Sto:lo people, the program hopes to develop land-based competencies such as cultural plant management, with potential synergies for fire management. Other models, such as the Tsawak-qin Forestry Limited Partnership (Cawak ʔqin Forestry) TFL on Vancouver Island demonstrate how Indigenous-led resource management might help to guide provincial policy for larger tenures. As the number of tenures held by First Nations is expected to increase, these models may offer important insights into building relationships between industry and nations, informing policy development for improved tenure arrangements (Fortier et al. 2013).

Inclusiveness and Power Balance

There was overwhelming consensus among survey respondents that there is a need to rebalance the BC forest sector to increase opportunities for smaller tenures and manufacturers. The major companies still retain significant market power, affecting multiple aspects of forestry, including obtaining value for logs, and ability to be competitive in bidding through BC Timber Sales. Several survey respondents raised concerns that current Market Price System (MPS) does not meet the interests of small-scale forestry. The MPS determines stumpage rates, which is the fee paid to the government for timber harvested on crown land. Stumpage rates are based on the price of lumber and lag three months behind the market, both of which were highlighted as concerns by respondents. However, the complexity of the MPS and risk of intensifying the US Canada softwood lumber dispute means solutions will be difficult to find. In the current system, community forests and woodlots pay tabular stumpage rates, which is discounted compared to the market rate paid by major tenures holders. First Nations Woodland licences pay market rates, with a revenue sharing arrangement with the government. The recent intentions paper includes a review of the current pricing system, proposing to harmonize all three at market rates. Without a shift to market rates, growth in small tenures (apportioned from large tenures) would mean a reduction in stumpage revenue. Despite concerns over the existing system, losing

the tabular stumpage rate would devastate small-scale forestry in BC. The BCCFA and FBCWA are currently in discussions with the provincial government on how to ensure changes to the stumpage system do not hurt the existing small-scale forestry.

Issues with competition and stumpage both link to long-term concerns over the concentration and control of forestry in BC by major companies. The structure of the tenure system has remained largely unchanged since it was first created in the late nineteenth century. As a result, forest policy in BC has continued to favour a large, profit-driven, forestry industry geared towards commodity production (Cashore 2011). The redistribution of tenures to smaller operators and First Nations seeks to rebalance the tenure system. However, with BC's major forestry companies already investing heavily in the USA and Europe, there is a risk that tenure reform will cause major disruptions to the forest sector. When we asked respondents whether smaller tenures are dependent on major forest companies, the median positive response was 81%. Many small-scale foresters would like to see transformative change, but as stated by one respondent "*the role of larger forest companies is critical to provide the support needed for these groups to succeed*". Creating a more inclusive sector cannot be achieved through tenure diversification alone. It requires working with mills, manufacturers, and forest managers to alleviate constraints, increase competition, and engage in dialogue on alternative tenure and pricing systems.

Conclusion

Small-scale forestry in British Columbia demonstrates the diversity of ways in which local forest management already delivers social, economic, and environmental benefits, despite policy constraints. This diversity is reflective of the geographic and cultural diversity of British Columbia, as well as small-scale forestry in a global setting (Harrison et al. 2002; Herbohn 2006). The current crisis of a declining fibre supply and public distrust in industrial forestry presents an opportunity to reflect and learn from those closest to the forests and communities we seek to sustain. As stated in the Old Growth Strategic Review, "continuing to apply the approaches that brought us to this point will not provide a sustainable solution" (Gorley and Merkel 2020). British Columbia's colonial history and sustained yield policies have been conducive to taking advantage of abundant, inexpensive old-growth fibre and investing in cost-minimizing technologies (De La Roche and Gaston 2001). Now, the gradual withdrawal of large industry coupled with increased societal demands on forests has prompted recognition that policy and practice need to evolve (Government of British Columbia, 2021b). The provincial government will not achieve its objective of a diverse, competitive forest sector without removing inhibiting regulations and creating space for local decisions on stewardship, management objectives, and innovation. There are ample opportunities for expanding benefits from forests, but these require the provincial government to rethink how forest benefits are defined; the vision for the future of forestry must encompass more than timber. Without this, forest policies can

be likened to a procrustean bed⁴, constraining the forest sector against timber values, and potentially harming the Indigenous and local communities they intend to support.

A holistic vision for a diversified forest sector cannot be set by the government alone - tenure decisions must be made with adequate engagement with forestry companies, allowing time to build trust and partnerships with First Nations and other tenure-holders. Local governments, research institutions, and associations each have a role to play in setting priorities, developing networks, and building trust and an evidence-base to support local forestry initiatives. More decision-making power in the hands of communities, First Nations, and individuals will likely lead to the prioritization of some goals over others, with varied perceptions on what is considered sustainable. If British Columbia is to shift away from commodity timber towards holistic management of diverse resources, society must be prepared for trade-offs. Further research on the relationship between small tenures and secondary wood manufacturing and the bundle of rights that would allow for enhanced benefits from forests could help to evaluate trade-offs for a smaller, healthier forest sector. A long-term vision for forestry that allows for gradual change and invests in local capacity and relationships could help to alleviate the costs and rebuild trust. Creating an enabling environment for small-scale forestry to thrive will be essential to catalyzing change towards a diverse forest sector in BC.

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⁴From Greek mythology - a procrustean bed is an arbitrary standard forced upon people, describing institutional tendencies to “squeeze life and the world into crisp commoditized ideas, reductive categories, specific vocabularies, and prepackaged narratives, which, on the occasion, has explosive consequences” (Taleb 2016).

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