

Can Smaller be Better?

The Role of the Woodlot licence Program in BC Forest Sector

By

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THE WOOLDOT LICENCE PROGRAM IN THE BC FOREST SECTOR

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Degree of Honours Bachelor of Science in Forestry**

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ABSTRACT

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Woodlot licences in British Columbia are small area-based tenures, held by individuals, small groups or families. Woodlot licences are often located in or near local communities and are thought to be in a better position to incorporate local values into management planning. The purpose of this study was to use measurable indicators to provide quantitative information on economic, social, and environmental impacts of the woodlot licence program on local communities and coastal BC. A survey with 18 indicators measuring environmental, social, and economic impacts was created, based heavily on the well-respected annual BCCFA Indicator Report. The survey was answered by WL holders in the North Island Woodlot Association (NIWA), which represents the north end of Vancouver Island and encompasses 45 WL's. The results indicate that woodlot licences provide similar economic impacts as the coast industry proportional to volume cut each year. As well it shows that woodlot licences play a role in diversifying the local economy, have high environmental standards, and are more accepted by rural communities than larger forms of tenure. Overall woodlot licences are a viable form of tenure on the BC coast when located in or near rural communities.

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INTRODUCTION

HISTORY OF WOODLOT LICENCE PROGRAM

The woodlot licence program was first introduced as licences called “farm woodlots” in B.C. in 1948, to allow farmers or ranchers access to crown timber to supplement their income (FBCWA 2017). At this time a farm woodlot was limited to an area that could sustain production of 283 m³/year, approximately 40 ha on the coast and 100 ha in the interior (FBCWA 2017). In 1956 the Sloan Royal Commission reported that the program was developing too slowly, with only 37 woodlots in existence, and that the requirements placed on licence holders such as data collection, inventories, sustained yield planning, reforestation, and harvesting were too much for such small areas of land (FBCWA 2017). In 1978, alterations were made to the program resulting from the report. The maximum size was increased to 400 ha, the licence holder was no longer required to be a farmer, and the licence term was extended to 15 years with a 5-year replacement provision (FBCWA 2017). After these changes, 450 woodlot licences were issued. Between then and now two more reports on the feasibility of the woodlot licence program were made, and more alterations were made to the tenure to arrive at the woodlot licence (WL hereafter) currently in use today (FBCWA 2017).

Presently a WL is defined as a small area-based tenure that “grants the licence holder exclusive rights to manage and harvest Crown timber within the woodlot licence area” (BC GOV 2006). Because WLs are issued on public land, there are major criteria they must meet to harvest. Including strategic and operational planning (included in the

woodlot licence management plan), keeping up to date inventories, reforestation, and stumpage payments. A woodlot is issued on 20-year terms, however most are replaceable every 10 years (FLNRO 2018).

Currently there are approximately 865 active WL's in BC, with a maximum size of 800 ha on the coast, and 1,200 ha in the interior (FLNRO 2018). Provincially, there are roughly 600,000 ha of crown land managed as woodlots (17% being private land), with an annual allowable cut (AAC) of 1.579 million m³ annually (2.3% of the provincial harvest) (FBCWA 2018). Licence holders being local individuals, families, or first nations there is an expectation that woodlots will be managed with respect to local opinions and desires, their personal management is thought to be held to a higher standard than those of larger forms of tenure (FBCWA 2018).

IMPORTANCE OF WL PROGRAM

Economic

WL's are relatively small, as a result they are not given much attention by most of the forest industry, though they still contribute to the economy, both locally and provincially. Because WL's are commonly owned by independent log seller's, they are often thought of as family forests. Provincially over 1,000 BC families rely on woodlot licences for all or part of their livelihoods (FBCWA 2017). As well as supporting individual family's financially, by hiring locally and acquiring supplies and equipment from local retailers, woodlot licences can make significant contributions to the economy in their surrounding communities.

Small forms of tenure serve as important sources for secondary and value-added

manufacturers, thus helping to meet the needs of smaller producers who need wood in smaller quantities than larger tenure holders like to supply. There are 81 woodlots on the coast, which in 2005 generated over \$9.5 million of economic activity, totaling to over \$200 million province wide (FBCWA 2017).

Social Impacts

Woodlot licences are the smallest form of tenure in BC, for this reason woodlot licences tend towards more ‘personal’ management, which is more difficult for industrial tenures because of the large size of their tenures. This more personal management is one reason woodlots are often situated next to communities or in highly sensitive areas. Woodlots contribute to their local to gain social acceptance of management practices. WLs can do this by investing money, time, and land in recreation-based projects, collaborating with locals on wildfire preparedness efforts, and by supporting education, either by donating funds and/or time to community programs.

Environmental

WL’s typically operate in difficult areas, either because the terrain is sensitive, or challenging in terms of adverse slopes, or because the operating area has local value. Since WL’s are crown land, they adhere to the same environmental requirements as larger crown land tenures (BC Laws 2018). Small forms of tenures like WL’s can manage the land more personally because licence holders are able to know every hectare in their land base. WL holders aim to identify locally valued areas in the licence through active community involvement and can manage the land to protect those areas.

Cultural impacts

Indigenous peoples in BC hold many woodlots, in the coastal region alone, more than 20 out of the 81 woodlots are managed by First Nation Bands. The report also aims to show the benefits of small-scale tenures on public land towards cultural benefits of the first nation community as well as all other citizens who use nature to improve their mental health and/or for spiritual connections.

SIGNIFICANCE OF STUDY

Because WL's are often held and managed by single individuals, small groups, or families, very little data has been collected on all aspects of the WL program in BC, making it difficult to demonstrate its importance. The study hopes to show how woodlot management better incorporates and represent local values, while still providing the same economic values of larger licences to the economy of BC.

To provide tangible and quantitative information on the benefits generated by the WL's, a survey with 18 indicators measuring environmental, social, and economic impacts was created, based heavily on the well-respected annual BCCFA Indicator Report. The survey was answered by WL holders in the North Island Woodlot Association (NIWA), which represents the north end of Vancouver Island and encompasses 45 WL's. The results will be analyzed and compared to the coast forest region industry averages.

Objective

Given their management by individuals and their proximity to local communities, WL are likely to have a disproportionate impact on local economies

through sourcing of local material and labour, use of wood resources, and maximizing the potential of the land base.

The objectives of this study were to use measurable indicators to show the impact the WL program has economically, socially and environmentally on its local communities as well as the province.

LITERATURE REVIEW

In considering the subject areas for the literature review, it was clear that the many different issues surrounding the topic could lead in many different directions. I have attempted to keep a practical question in mind: what has led to the introduction of small-scale forestry tenures, and what insight and guidance can literature provide for small tenures operating currently and in the future? The performance and progress of small tenures such as woodlot licence is explored in the examination of literature from varying viewpoints such as political, environmental, scientific, as well as perspectives of those currently managing small tenures today.

LAND BASE USE IN B.C.

The province of BC has a land base of 95 million hectares. 95% of the land base is owned by the provincial government, and of this area 23 % comprises the timber harvesting land base (Bliss and Kelly 2008). Three percent of the land base is owned by the forest industry, one per cent is privately owned, one per cent is apportioned as First Nations reserves, and the remaining per cent lies in federal parks (BCStats 2017). Close to 65 % of the province is forested (Natural Resources Canada 2005). After removing inaccessible, inoperable, and protected areas, an average of 20 million ha's is considered operable productive forest (Natural Resources Canada 2005). With the large land base of forest land, it is hard to believe that the forest sector is a main factor in BC's economy, contributing 15% of BC's economic activity and 14% of provincial employment (B.C.

Ministry of Forests, Mines and Lands 2010). Similar to other regions with large high proportions of publicly owned forest land, the provincial government of BC has granted management and access rights to large scale private forest companies through industrial forest tenures (BC GOV 2006). Industrial licences make up almost all of the provincial allocation of harvest rights. Currently nearly 75% of the harvest from provincial forests is allocated to large scale forest companies through industrial are and volume-based tenures (B.C. Ministry of Forests, Mines and Lands 2010).

To remain viable in the international lumber market, many forest companies have merged resulting in fewer and large-scale companies that are controlling larger areas of land (Cathro et al. 2007). For example, in 1999 Weyerhaeuser Co., the 3rd biggest forestry company in the U.S., bought Macmillan Bloedel, which at the time was Canadas largest forest products company (Pritchard 1999). Macmillan Bloedal shut down and Weyerhauser absorbed it tenure, created one forest company with a very large management area. Even recently two large forest companies operating on the BC coast, Island Timberlands and TimberWest merged in late 2018 to form Mosaic Forest Management (MFM Corp. 2019).

In 2006, only six forest companies held the cutting rights to approx. 40 % of the provincial AAC (Cathro et al. 2007). Today the six top forest companies on the coast hold 66% of the coastal AAC (Martell via email, Nov 21, 2018).

Rural communities have long been skeptical to believe that production based industrial tenures can meet public interests as well as sustainable forest management objectives (Bliss and Kelly 2008). Small-scale tenures are less worrying to the public because they control a much smaller area and are thought to prioritize local needs, because public support is needed to operate so close to urban areas (Moffat et al. 2015).

EMERGENCE OF SMALL TENURES

Demands from the local community members and general public across BC for more involvement in forest management has resulted in the government of British Columbia creating opportunities for small tenures in the form of woodlot licences and Community Forest Agreements (CFAs) (Ambus et al. 2007). Supposedly small tenures are expected to manage for multiple forest values, reflect local priorities and goals, spur economic diversification, generate benefits, and support manufacturing and value-added processing (Dunster 1994; Burda et al. 1997). To summarize, small tenures carry heavy expectations.

In a broad sense, tenure is a set of socially recognized and enforceable rights to land and natural resources that can be bundled in many ways (BC GOV. 2006). In British Columbia, tenure means a legal contract through which rights to use forest resources are given for a defined period of time in exchange for satisfying management obligations stated in licences and approved plans (Haley and Luckert 1998). The BC Ministry of Forest, Lands, Natural Resource Operations and Rural Development (FLNRORD) defines the provinces tenure system as “the collection of legislation, regulation, contractual agreements, permits, and governments policies that define and constrain the use of public forest resources, primarily timber” (Meyers Norris Penny, Enfor Consultants 2006).

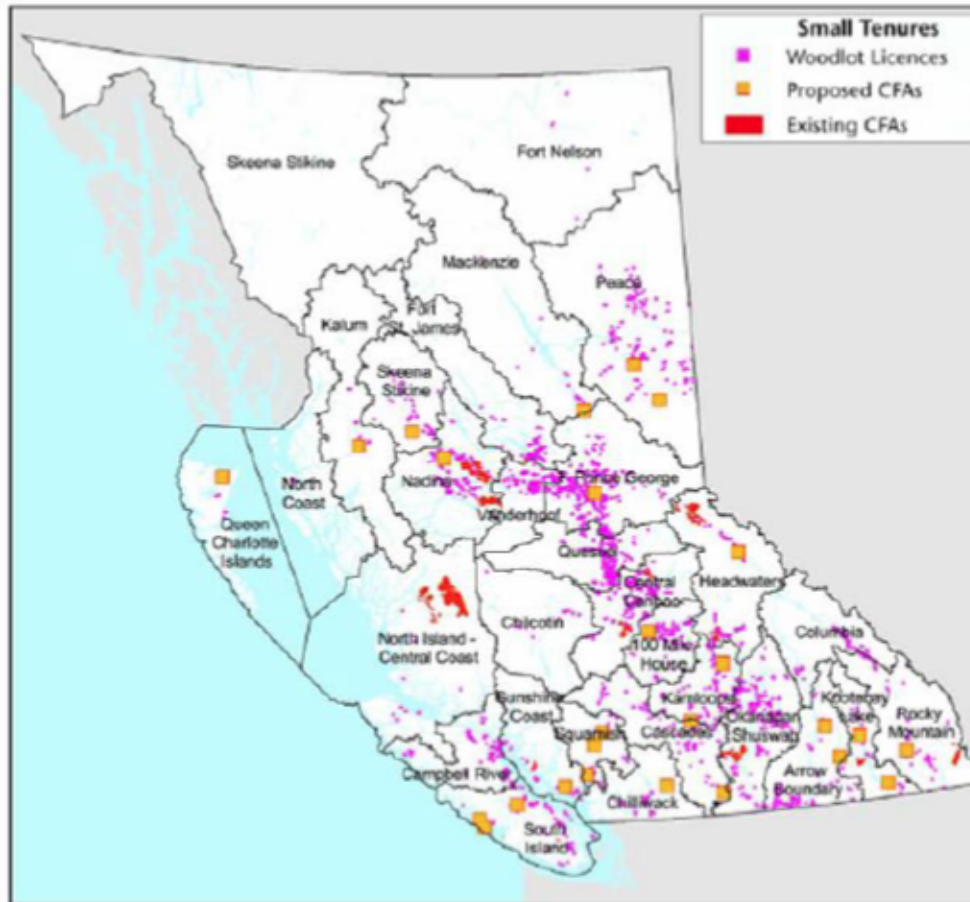
Currently BC’s forest industry is changing. Supplies of high-value old-growth timber are diminishing, and now that the sector is cutting second growth forests, BC may be losing its competitive edge to countries with fast growing, intensively managed

plantations (Dumont, B. and D. Wright. 2006). Simultaneously public expectations for forests to be sustainably managed – balancing ecological, social, and cultural values while still remaining profitable – are becoming more prominent (Hamersley-Chambers and Beckley 2003). The creation of small tenures such woodlot licences and CFAs are a result of the forest sector transitioning, intended to satisfy a diverse set of expectations at the local and provincial levels.

LOCATION AND MANAGEMENT IMPLICATIONS

Small tenures exist most often in rural areas (B.C. Ministry of Forests and Range 2007). In accordance, CFAs and woodlot licences are typically awarded in or close to rural communities, frequently visible from local viewsheds that are valued for the tourism industry, watersheds, aesthetics, recreation purposes, and hunting (B.C. Ministry of Forests and Range 2007).

The land base of small tenures preferably consists of a balanced-aged class distribution forest cover with forest productivity adequate to provide a sustainably profitable AAC for the tenure (Cathro et al. 2007). Supporters of small tenures emphasize that the most desirable location for a small tenure is directly adjacent to the local community (Gunter 2004). Having a historical relationship with the land adopts a “sense of connection or stewardship” integral to obtaining social licence for the tenure (Gunter 2004). Every small-scale tenure such as woodlot licences, have multiple overlapping values in the areas surrounding the community to manage for (B.C. Ministry of Forests and Range 2007). These values present both a challenge and opportunity in central management.



Source: Cathro et al.

Figure 1. Woodlots and community forests (both awarded and in application) as well as Forest Districts and water features

Currently forest dependent communities in BC are experiencing substantial economic, environmental and social changes (Morford and Kahlke 2004). Numerous factors are pushing these changes. The population in rural areas is aging, as well as the overall birth rate is declining (Bliss and Kelly 2008). Numerous school and hospital closures is a growing problem in rural BC, reducing the overall access to rural health and education services (Bliss and Kelly 2008). As well the aging transportation infrastructure restricts travel to populated areas and limits movement and delivery of goods and services (Morford and Kahlke 2004).

Associated with the transition happening in local communities, relationships are

changing between forest dependent communities, the forest resources, and the local economy. Advances in technology used in the forest industry are reducing employment opportunities and challenging historic forest practices (Morford and Kahlke 2004). Combined with climate change, these issues are generating an uncertain future for forest-dependent communities.

POTENTIAL ADVANTAGES OFR SMALL TENURES

Human Attributes

Many of the advantages of small-scale tenures come from characteristics of the tenure holders themselves. The hypothesis that people who live in place will care more for that place, will develop place-based knowledge and awareness, and will have a vested interest in ensuring the long-term health and well-being of that place, is often termed bioregionalism (Thayer 2004). When discussed in the realm of forest management, the approach advocates that woodlot licence holders may be more considerate towards the environment and public wishes, due to their proximity to the forests they manage. Corporate forest management must be aware of shareholder values and manage for to meet quarterly goals; public forest management is founded on political processes and public input (Bliss and Kelly 2008). Conversely, family forest management such as the majority of woodlot licences, are managed by individuals, families, or small groups of likeminded people (Bliss and Kelly 2008).

Historically when forests were managed for a single value - sustained flow of timber - the diversity of objectives for small tenures has frustrated professional foresters who seek to find a uniform method of management that can be applied across the

landscape (Butler and Leatherberry 2004). Presently, society views the large array of objectives as a positive, particularly when applied to the landscape (Stanfield et al. 2003). The diverse ecological, social and economic values stemming from personal management with community inputs provides a balance to the more uniform management of corporate tenures (Stanfield et al. 2003).

The amount of hands on experience and location-based knowledge obtained by small tenure holders allows managers to make informed management decisions surrounding all aspects such as terrain, regeneration, pest management and operating decisions and observe the results of their actions over time (Bliss and Kelly 2008). Such results-based management fits within the bounds of bioregionalism (Thayer 2003). Supporters of this approach emphasize that natural resource managers require both place-based knowledge as well as supporting scientific information and implement it with active participation (Carr 2004).

Value Orientation

Small-scale tenure holders commonly describe their management decisions as value-driven, meaning they are inspired by an inclination to do what they believe as right for their management area (Bliss and Martin 1989). While profit is a management driver of all tenure holders, from small to large, small-scale tenures reportedly make management decisions in efforts to reflect the diversity of their objectives (Bliss and Kelly 2008). Some decisions are made for financial reasons, others are made based around the desire to protect and restore their land, to test alternative silviculture practices, or to expand recreational opportunities (Bliss and Kelly 2008). Corporate companies strive to make decisions surrounding multiple objectives for their forested

lands as well, however they have responsibilities to a body of shareholders and bureaucratic corporate structure (Bliss and Kelly 2008). Therefore, the landscapes of most institutional investors are unlikely to reflect values that are not required by law or driven by economics (Beckley 1998). There are exceptions to this, and recently large tenures have been known to exceed environmental requirements in order to gain a “green” reputation towards buyers (Bliss and Kelly 2008).

Social Acceptability

When the general public discuss forestry, they are most often referring to the main industrial companies and are not as aware of small tenures. However, a study by Bliss et al. in the United States indicated that relative to corporate forestry, small scale tenures are viewed more favorably by the American public (1994). The survey results from this study suggests that Americans are more tolerant of timber harvesting on personally managed lands rather than corporate lands. Though forestry is very different in the U.S., largely due to the majority of land being privately owned, sentiments from the survey can still be applied globally (Bliss et al. 1994).

In a recent issue of the BC Forest Professional magazine discussing public perceptions of small-scale forestry, tenure holders wrote the impact they have on their local public. Tenure holders acknowledge that the reality of forestry in the urban interface is that a cut block adjacent to a private residence is a permanent change for that resident, regardless of silviculture, or landscape level planning (Marlow 2017). Therefore, anything that can be done to aid public state of mind, such as using hand fallers rather than large scale machinery, maintaining high retention, or simply avoiding terminology publicly associated with harsh management, such as clear cutting, is done to

ease local state of mind (Marlow 2017). Small scale tenure holders should understand the concept of perception as accepting that the public may have different interpretations to forestry operations, but also as a willingness of forest professionals to change their perception of traditional forestry (Marlow 2017). By fostering collaborative relationships with the local community, social acceptance can be, or continue to be, achieved for small-scale tenures.

CHALLENGES FOR SMALL TENURES

Industry consolidation

Along with changes in rural demographic, infrastructure, and ecological changes, natural resource-based communities in British Columbia are facing new challenges created by the global economy (Cathro et al. 2007). The Canadian forest industry is facing high competition from countries which can produce fibre and pulp products with faster growth rates, reduced environmental regulations, and cheaper labor costs (Morford and Kahlke 2004). To balance this, the forest sector is moving to larger economies of scale, increased computerization, and greater consolidation (Morford and Kahlke 2004).

Striving to increase efficiency, and backed by government policy, forest companies are consolidating (Cathro et al. 2007). Closing their small scale, less efficient mills located near where the timber is harvested and opening larger mills in more central locations. The location shift and consolidation of large forest companies is reducing the inflow of wealth to previous small mill-based towns (Catho et al. 2007). Effecting the economic tie between rural communities and their surrounding resource base.

The long-standing view of grabbing high value species in easily accessed areas is

resulting in longer and longer hauling distances, increasing cost per m³ and is causing sharp declines in AAC projections (Walters 2013). The low marketability of remaining timber paired with the downsizing of coastal forest industry to remain profitable, generates more pressure on rural economies (Walters 2013). The interior of BC is currently dependent of salvaging low-cost, beetle killed wood (Parfitt 2006). The inevitable varying nature of timber supply's, combined with the changing market conditions, commonly creates a boom-bust cycle for rural communities (Cathro et al. 2007).

Forestry based communities, as well as all-natural resource dependent communities, are challenged to diversify their revenue streams without compromising on ethical and environmental standards or reducing their quality of life (Bliss and Kelly 2008). Woodlot licences and other small tenures show that they use human as well as environmental resources as assets, valuable as a mechanism for renewal and diversification.

Economies of Scale

A goal of tenures such as Woodlot licences that employ people who live near the managed resource, in this case forests, is the development of small-scale community based economic systems where individuals work towards self-sufficiency by harvesting and marketing goods (Carr 2004). Walters D. asserts that woodlots in BC play a key role in creating jobs as well as providing personalized management plans that incorporate the views and values of local stake holders, but face main barriers including economies of scale and market access (2013). Simple economies of scale mean that fixed operating costs for forest management will be higher for small tenures (Cathro et al. 2007). This

constrains profitability but can inspire innovation, such as diversifying the products they produce (Ambus et al. 2007). In addition, because the timber from small tenures is not necessarily associated with one manufacturing facility, it's possible for small tenures such as woodlot licences to contribute to local value-added manufacturing opportunities (Cathro et al. 2007).

MORE RESEARCH OPPROUNITIES

The nature of small-scale tenures means that they are located near rural communities and play a growing role in diversifying local economies and the viability of small towns. To increase the understanding around the potential for rural communities and for the province, more research into small tenures is required. Small tenures can be used as pilot areas to test alternative forest practices or as trail areas to better understand emerging issues such as climate change and the development of non-timber forest products (Cathro et al. 2007). As well small tenures can be good to explore partnership possibilities with local governments, or interface fire management groups (Cathro et al. 2007). Finally continued research should be done into generating crown revenues from stumpage most efficiently while providing for locally based economic viability as well as research into assessing the true impact of small tenures on rural economic development (Cathro et al. 2007).

MATERIALS AND METHODS

STUDY AREA

The case study area is the North Island of BC, an area of high biological production and biodiversity, and home to many ecologically important and threatened species (Macduffee 2011). BC occupies 10% of Canada's land area while containing more than half of Canada's vertebrates and vascular plants, and three quarters of its bird and mammal species (BCMELP 2006). Relative to the rest of the province, the majority of those are found on the coast, as illustrated in Table 1.

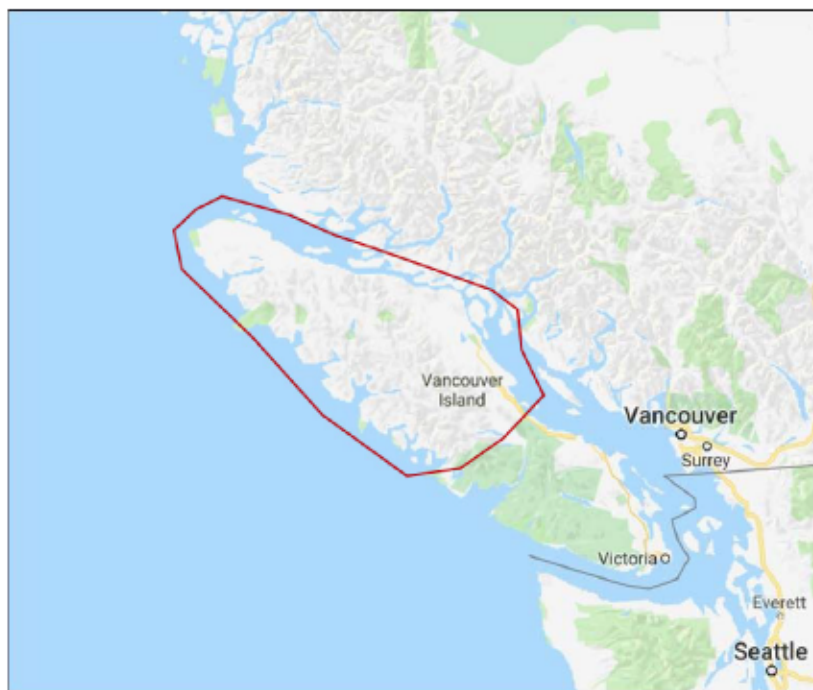


Figure 2: Map of Study Area

Table 1. Percent of BC animal species which live in coastal environments

Species type	Percent which mainly inhabit coast
Mammal	78
Bird breeding areas	64
Amphibians	64
Reptiles	69
Fresh water fish	67

Source: MacDuffee 2011

In 2005, 86 coastal BC species were listed as locally extinct, endangered, or threatened by the committee on the Status of Endangered Wildlife in Canada (Gilkeson et al. 2006). Out of the 251 species that have become extinct or extirpated from the province in recent history, 15 were coastal. Only one extirpated species, the sea otter, has been successfully reintroduced (Gilkeson et al. 2006). The greatest loss of species and habitats occurs in the south coast, where human population is the most concentrated (Gilkeson et al. 2006). With the ecological importance of the BC coast, it is important that light touch operations, such as small-scale forestry, be recognized and valued to conserve coastal productivity and biodiversity.

The specific study group are member woodlot licences of the North Island Woodlot Association (NIWA), located within the North Island, Campbell Forest and Sunshine Coast Forest Districts. Containing over 40 woodlot licences, the majority are between 400-800 ha's. Located from mid Vancouver Island, to the northern tip, as well as on the sunshine coast, they cover a variety of ecosystems and include a variety of species and animal habitats. The north coast of Vancouver Island was chosen as the

study area, due to its significance to the BC forest industry, and the willing participation and support of NIWA.

FRAMEWORK

The framework of the study was based on a survey and reporting model developed by the BCCFA in 2014. The CFA indicator survey is sent to all community forests across BC, to measure and track the benefits of community forests in BC. The responses are collated and published annually in the Community Forest Indicator Report (CFIR). BCCFA indicator report was chosen as the basis for the NIWA survey for its success at providing measurable indicators on small tenures and small-scale forestry.

NIWA SURVEY DEVELOPMENT

Although both CFAs and WLs are small area-based tenures, there are some key differences. WLs tend to be smaller and operated by groups or individuals rather than non-profit organizations. Hence, the original BCCFA indicator survey has been modified to measure WL specific information.

The majority of questions removed from the survey were specific to community development and allocation of funds within the community. Questions surrounding total m³ harvested and total annual income were changed from a specific text box answer style to a multiple choose style to maintain anonymity of NIWA members. Edits and revisions were made in consultation with NIWA board of directors.

The NIWA survey was created within SurveyMonkey, an online survey distribution program. Detailed instructions were included within the survey for each

indicator. The survey was then distributed via a mass email to the NIWA, containing a direct link to the survey. The survey was separated into a number of sections based on the list of indicators representing social, economic, and ecological aspects of the woodlot licence program. The first sections asked questions concerning basic characteristics of each respondent's WL, such as size, components of private land, and proximity to urban areas. Following sections were listed as indicator 1: number of jobs, indicator 2: community contributions, and so on to the last section, indicator 11: management of sensitive areas.

DATA

The data used for this report were obtained from the responses of NIWA members to the survey described above. WL's mean statistics were compared to the local industry averages, particularly for the comparison between FTE (full time equivalent) jobs/1000m³. Coastal industry averages (major licensees) used for comparisons were derived from annual allowable cuts (AACs) and employment statistics of major coast licences, obtained from the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) and the Business in Vancouver annual employment report respectively (Government of British Columbia 2018, Bennett 2018).

DATA ANALYSIS

Following the closing date for the survey, all survey responses were exported to excel. Because not all respondents answered all questions, responses for each question

were tabulated individually. The questions were grouped by indicator, and each indicator was then presented in a table, graph or chart depending on the results.

RESULTS

The following results are presented by indicator. The results are not based on the percentage of total woodlot licence population on the coast, but on the percent of woodlot licences that responded to each individual question.

BASIC INFORMATION

Before indicator questions were asked, basic information was collected on the characteristics of each respondent's woodlot licence. Information collected showed that most wood lot licences are between 300 - 400 ha in size (Figure 3), due to the past maximum size of 400 ha per WL on the coast.

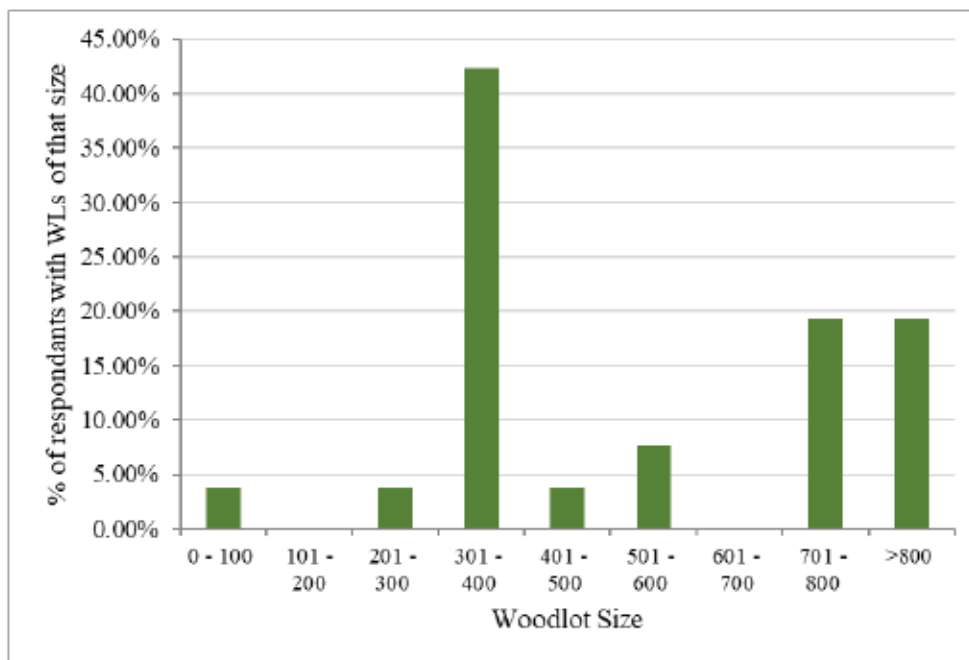


Figure 3. Size distribution of north island woodlot licences

The data also shows that 52% of woodlot licences are located within 800m of a

town (Figure 4). This represents the high proportion of woodlot licences that operate in socially sensitive areas and must incorporate community values into management.

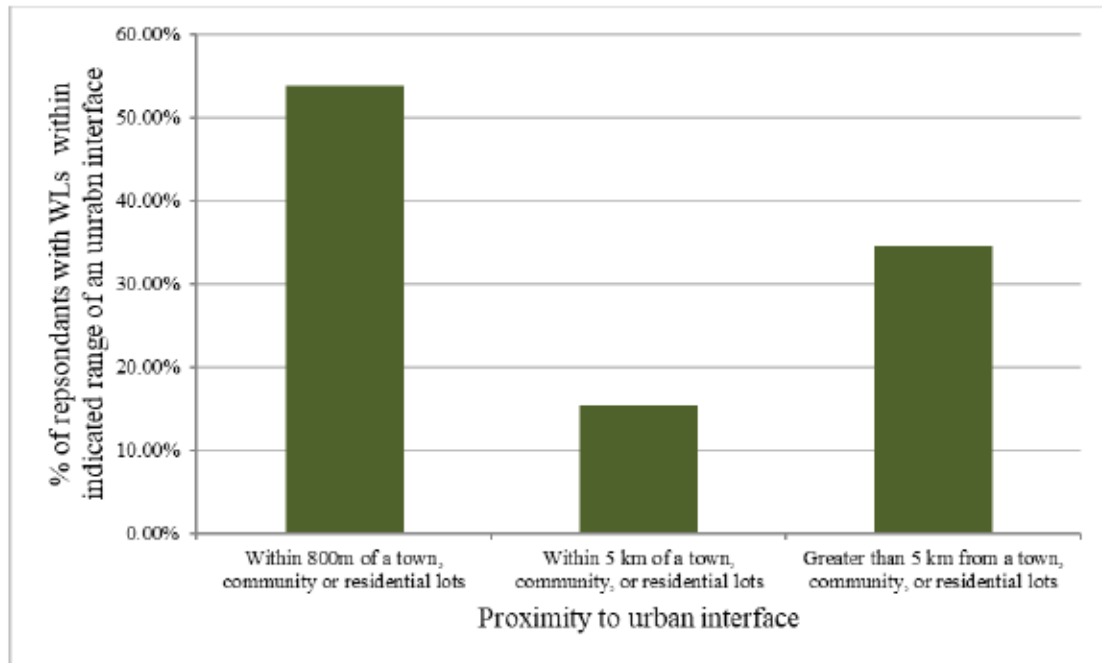


Figure 4. Proximity of north island WL's to urban areas

INDICATOR 1: NUMBER OF JOBS

The average AAC for the 55 WL's in the NIWA in 2018 was 3028 m³/per year (Table 2. Total and average AAC of north island woodlot licences (. Due to the recent changes in woodlot licence size, the AAC of woodlot licences on Vancouver Island (and across the province) are highly variable. As well due to the high proportion of private land added in to a small number of woodlot licences in the study area, which has resulted in an abnormally high AAC, the four highest and lowest woodlot licence AAC were removed from the computation of average and total AAC in table

The average AAC between three main coastal industry companies in 2016 is 3,261,588 m³/ per year (Table 3).

Table 2. Total and average AAC of north island woodlot licences (rounded to nearest tenth)

Annual Allowable Cut (AAC) (m ³)	
Total Woodlot Licences	55
Total AAC (m ³)	166535
Average AAC (m ³)	3028
Lowest AAC	1309
Highest AAC	7284

Source: BC GOV 2018

Table 3. Individual and total AAC for coast forest industry companies

Company	AAC	Staff
Western Forest Products	5759837	2236
Interfor	3343116	1187
Teal Jones	681811	1000
Average	3261588	1474
Total	9784764	4423

Source: BIV (Business in Vancouver) 2018

The average of coast industry AAC is significantly higher than average woodlot licence AAC. From these values, the total full time equivalent (FTE) jobs per hectare were calibrated for industry and woodlot licences. Industry employment came out to 0.45 jobs per 1000 m³, where as woodlot licence employment was calculated at 0.56 FTE jobs per 1000m³, 24% higher than the industry average (Table 4).

Table 4. FTE jobs per 1000m³

Forestry Sector	FTE Jobs/1000m ³
Coast Industry Average	0.45
Coast Woodlot Licence Average.	0.56

Source: Business in Vancouver (BIV) 2018

INDICATOR 2: COMMUNITY CONTRIBUTIONS

Respondents were asked if they had made any cash donations to their communities in the last reporting year and if so, how much in total they had donated. 93% of the respondents made cash contributions in their communities. In total, the respondents contributed \$58,500 in the reporting year, as well as other in-kind donations (Table 5).

Table 5. Summary of total cash contributions by north island woodlot licences to their communities

Total \$ Contributions to the Community	
Number of responses	15
Total	\$58,500
Average of all respondents	\$3900
Number of WLs that made contributions	14
Average of those that made contributions	\$4178
Minimum	\$1000
Maximum	\$10,000

Many licence holders reported that they have donated more in time and in-kind donations to their community, more than a monetary sum. Examples of in-kind contributions from north island woodlot licences are listed below.

In-kind contributions

- Volunteer board member - Woodlot Product Development Council and North Island Woodlot Association
- Donation of logs community events and projects
- Firewood donations for charity auctions
- Donations of trail building materials to recreation groups
- Donation of gravel to community center
- Sponsorship of 2018 trail building workshop
- Participation in beach clean up

INDICATOR 3: CUT CONTROL

Indicator 3 measures the proportion of WL's that are on track to meet their current cut control in the current 5-year period. Cut control allows licences to manage their AAC on a 5-year basis. For example, although an agreement with AAC provides harvesting rights on an annual basis, cut control rules allows the holder of the agreement to harvest future rights to this year or to carry right from this year into future provided the harvest volumes stay within time and volume limits specific to the agreement (MFLNRO 2017). Out of the 15 respondents, all reported that they are currently on track to meet their current cut control.

INDICATOR 4: DISTRIBUTION OF LOG SALES

Results show that 50% of the volume sold by north island woodlot licences was through a broker who was used to sell volume to large scale saw mills. 18% went to local mills, 12% sold to OSB mills, 7% sold to log exports, and the remaining 17% sold to personal mills and mass firewood sellers. This indicator demonstrates that woodlot licences sell to and strive to support the full scale of milling and manufacturing facilities.

Table 6. Summary of the distribution of log sales

Distribtuion of Log Sales	
Number of responses	15
Sold through log broker	50%
Direct Sales (Local mills)	18.00%
Personal mill	10.00%
Veneer, Plywood, and OSB	12.50%
Shake and shingle	0.50%
Firewood	2%
Log exports	7%

Respondents were also asked to report on whether they had markets for waste and residue., and if those markets were being actively sought. 67% percent reported having markets for waste and residue, an additional 22% are actively seeking markets, and 22% listed alternatives to waste and residue markets, pre-dominantly post residue survey firewood permits.

INDICATOR 5: INVESTMENTS IN INTENSIVE SILVICULTURE

Survey respondents were asked to report the total value, in dollars, of the woodlot licence's investment of their own money as well as money from outside sources in intensive silviculture, incremental to legal requirements. Activities include: spacing, brushing, and enhanced genetic stock.

Table 7. Summary of total value of WL's own investment in intensive silviculture

Total of WL's Own \$ Invested	
Number of responses	12
Total	\$167,000
Average	\$13,917
Number of WL's invested in intensive	10
Average of those that invested	\$16,700

Table 8. Summary of hectares treated with intensive silviculture for all woodlot licences in the NIWA in 2017/2018

Hectares Treated	
Number of responses	10
Total (ha)	144
Average hectares treated	10
Average hectares harvested	11
percent of harvested landbase treated	91%

Table 9. Summary of hectares treated with intensive silviculture across British Columbia in 2017/2018

Provincial Statistics of Intensive Silviculture	
Total hectares treated in 2017	76,803
Approx. hectares harvested in 2017	190,000
Percent of harvested landbase treated	40%

Source: Ministry of Forests, Lands, and Natural Resources, 2019

Woodlot managers within the NIWA invested approx. \$167,000 in intensive silviculture in the last reporting year (Table 7). Out of the total area harvested in the last reporting year, 91% was treated with intensive silviculture (Table 8). Comparatively 41% of the harvested land base in BC in the 2017/2018 reporting year was treated with intensive silviculture (Table 9). Although coastal statistics were not available, the provincial silviculture figures are still relevant for an industry to small tenure comparison.

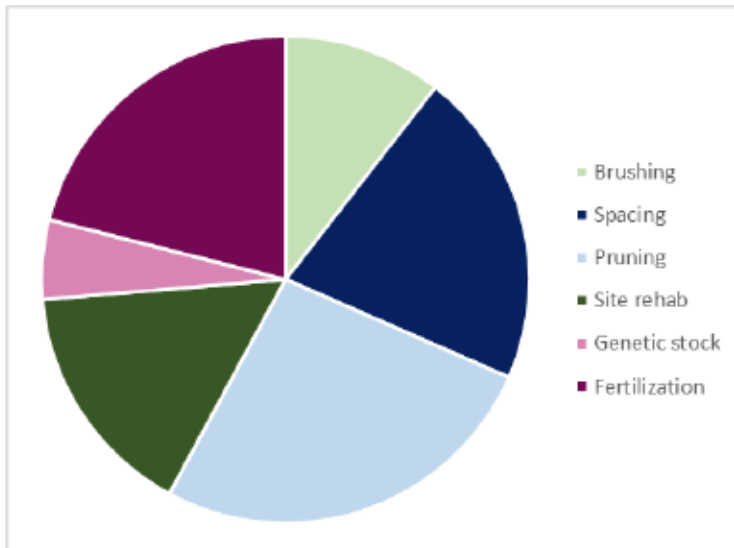


Figure 5. Proportion of silviculture methods used by respondents

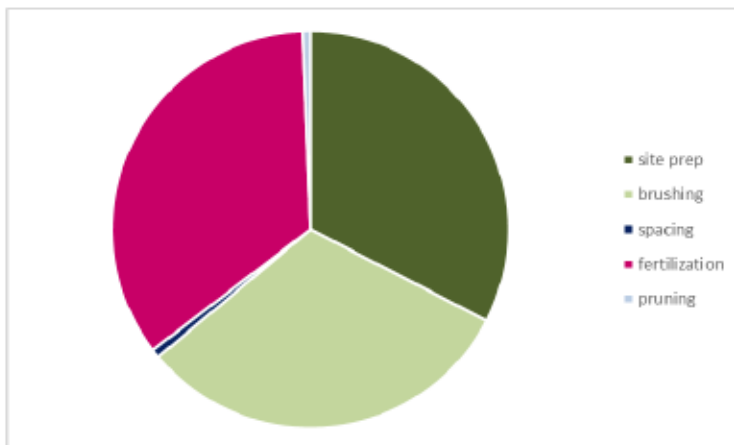


Figure 6: Proportion of silviculture methods used on crown land across B.C.

The most common silviculture activity used by woodlot managers in the NIWA is pruning, with spacing as a close second. In contrast site prep and fertilization were the most commonly applied silviculture practices on crown land provincially.

Silviculture practices that are used immediately with regeneration, such as site prep, using genetically improved stock, and fertilization, are used by woodlot licences however more commonly used by industry. Whereas post regeneration silviculture practices such as pruning and spacing are used more commonly by woodlot licences.

INDICATOR 6: ECONOMIC DIVERSIFICATION

Non-timber forest products (NTFPs) refers to the products of biological origin other than timber, derived from forests (NRCAN 2016). While 43% of respondents indicated they currently manage for NTFP, only 2 generate revenue from NTFP - Christmas trees and wreaths.

INDICATOR 7: COMMUNITY ACCOUNTABILITY

Indicator 7 measures whether woodlot licences report out to their communities on its progress towards objectives identified in the Woodlot Licence Management Plan, and the methods they used to engage with the community. The community groups that are actively engaged with the most are local firewood salvagers, hunting groups/individuals, and property owners (Figure 7. Summary of the proportion of community groups WL's engage with annually).

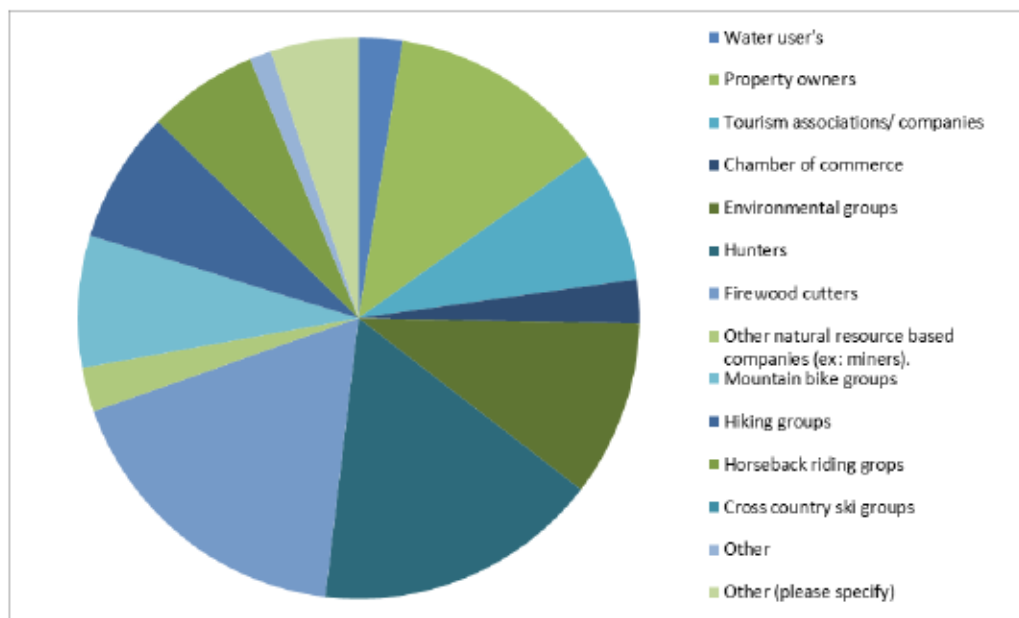


Figure 7. Summary of the proportion of community groups WL's engage with annually.

Guided field trips are the most common method woodlot licence holders use to inform the community of current and planned operations within the licence (Figure 8). Open houses and articles in the local newspaper are also a common method licence holder use to communicate plans with the community.

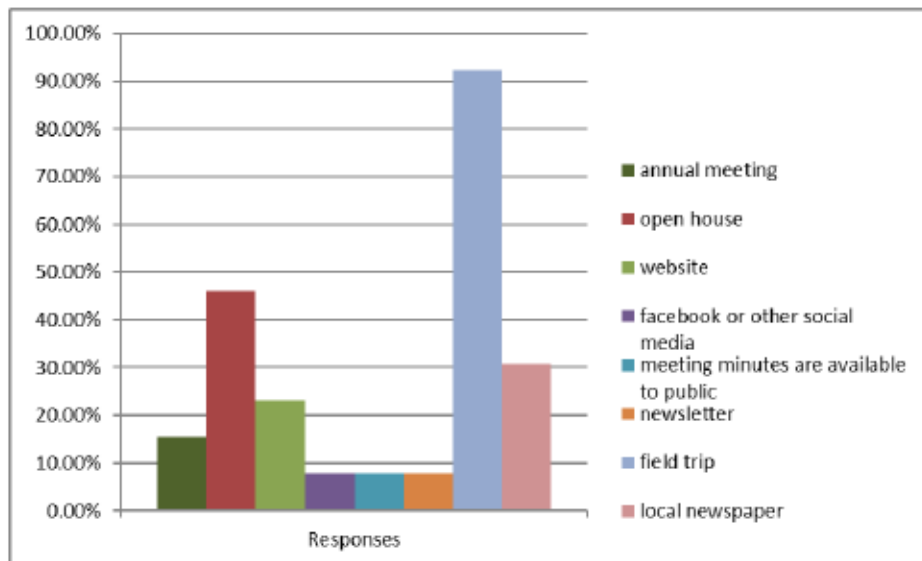


Figure 8. Methods employed by WL's to communicate with community groups

INDICATOR 8: INVESTMENTS IN COMMUNITY EDUCATION

This indicator measures the investments WL's makes in education and capacity building. Respondents were asked to report on whether they participate in/ support community education and if so, what is the time spent and total value, in dollars, of all investments in education. This includes school presentations, field trips, public events, as well as training supported by the woodlot licence (such as first aid, faller certification, etc.), by woodlot licence staff, contractors, employees and volunteers.

79% of NIWA members participate in community education (Figure 9), and 29%

of the respondents have invested over 25 hours of their own time to delivering community education in the last reporting year (Table 10).

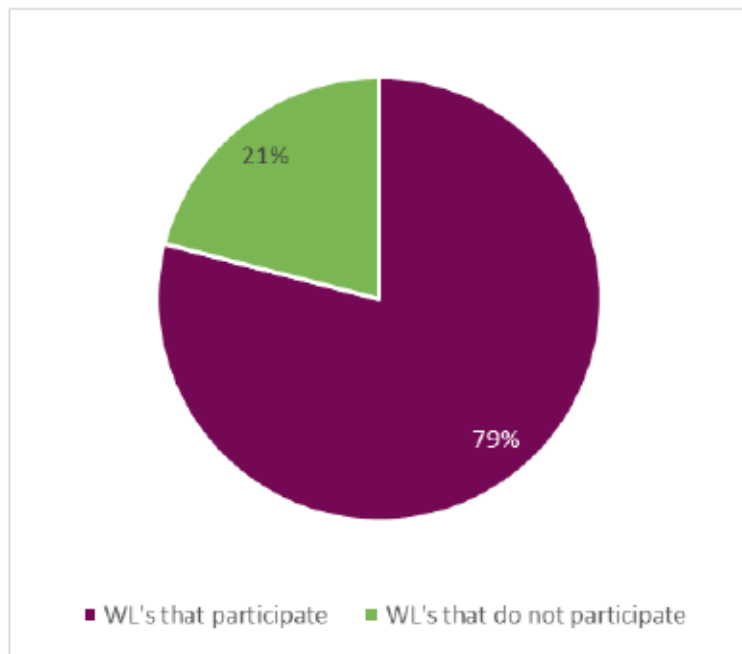


Figure 9. Participation of WL's in community education

Table 10. Hours spent delivering educational experiences

Hours	WL's contributing that length of time	Percent
Number of responses	14	
0 -5 hours	4	29%
6 - 10 hours	3	21%
11 - 15 hours	2	14%
20 - 25 hours	1	7%
25+ hours	4	29%

In the last reporting year Woodlot licences have donated a total of \$11,000 to community education, with an average of \$1,375 per licence. Past educational experiences woodlot licences hosted in the past include:

- Field trip for the North Island Woodlot Association (NIWA)
- AGM field trip for Federation of British Columbia Woodlot Associations (FBCWA)
- Host cultural forest demonstrations by local First Nations Elders
- Host local outdoors groups demonstrating forest health concerns

- Elementary, middle, and high school class tours
- Forestry student employment and education
- Coastal silviculture committee tour

Table 11. Dollar value invested in education by WL's

Total Value in Dollars of WL's Investments in Education	
Number of responses	10
Number of WL that donated	8
Total	\$11,000
Average of those that donated	\$1,375
Minimum	\$250
Maximum	\$2,500

INDICATOR 9: INVESTMENTS IN RECREATION

This indicator measures the value of the cash and in-kind investments in recreation made by woodlot licences, and the kilometers of trail built or maintained. Respondents also included investment in recreation features & trails outside the boundaries of the woodlot licence. A total of \$12,500 was contributed to community recreation by respondents in the reporting year (Table 12). As well a total of 96 km is currently available in in the respondent woodlot licences, making an average of 6.9 kms of public trail per woodlot licence (Table 13).

Table 12. WL's that have donated to community recreation

Total \$ invested in recreation	
Respondants	14
WL's that have donated	8
Total \$ invested	\$12,500.00
Average of those that invested	\$1,562.50
Total hours invested	105 Hours
Average of those that invested time	13 Hours

Table 13. Summary of kilometers of trail in WL's

Number of kilometers of public trails in WL's	
Number of Respondants	14
Total number of km's in WL's	96
Average number of km's	6.9
Minimum	1.5
Maximum	20

INDICATOR 10: WILDFIRE MANAGEMENT

Survey respondents reported on the value of investments, cash and in-kind made by the community forest to reduce wildfire hazard and the number of hectares treated. To date the reporting woodlot licences have collectively treated 90 ha and have invested a joint \$81,700 for wildfire mitigation.

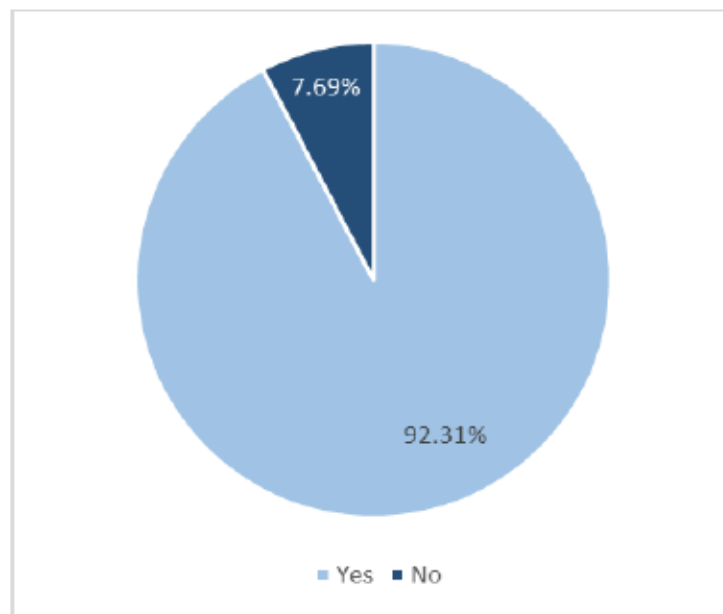


Figure 10. WL's that have completed a wildfire assessment in the reporting year

Table 14. Summary of total investments and hectares treated to reduce wildfire hazard

Wildfire hazard abatement	
WL's that have participated in wildfire hazard abatement	13
Total area treated (hectares)	90 ha
Average area treated (ha)	7 ha
Total \$ invested	\$81,700
Average \$ invested	\$6,285

INDICATOR 11: MANAGEMENT OF SENSITIVE AREAS

Survey respondents were asked to report on the area within their land base that is sensitive. Sensitive areas are defined as: domestic and community watersheds; riparian areas; visually sensitive areas; potentially unstable and unstable terrain; areas with archaeological values or cultural heritage; identified and critical wildlife habitat; fisheries sensitive watersheds; recreation trails and sites; and areas identified as sensitive by the community. 25% of respondents reported that over 100 ha of their woodlot licences is considered sensitive, however 18% have reported that over 100ha in their woodlot is considered sensitive and operable.

Table 15. Area considered sensitive within woodlot licences

Percentage of area considered sensitive	
Number of responses	16
0 - 20 ha	6.25%
21 - 40 ha	12.50%
41 - 60 ha	12.50%
61 - 80 ha	25.00%
81 - 100 ha	18.75%
100+ ha	25.00%

Table 16. Area considered sensitive and operable within the woodlot licence.

Percentage of area considered sensitive and operable	
Number of Responses	16
0 - 20 ha	38%
21 - 40 ha	25%
41 - 60 ha	6%
61 - 80 ha	6%
81 - 100 ha	6%
100+ ha	19%

DISCUSSION

The objective of this report was to use eleven measurable indicators to show the impact the woodlot licence program has economically, socially and environmentally in its local communities as well as across BC.

ECONOMIC INDICATORS

Indicator 1, number of jobs, measures the total full-time direct employment generated by woodlot licences within the study area. According to table 3, the coast industry average was 0.45 FTE jobs/1000m³, the coast woodlot licence average based on respondents to the WL indicator survey is 0.56 FTE jobs/1000m³. This shows that coastal woodlot licences generate 24% more full time jobs than industry. An annual study by the BCCFA, shows that community forests agreements, another form of small tenure in BC, generate 0.82 FTE jobs/1000m³ (including milling jobs). The provincial industry average is 0.2 jobs/1000 m³ of industrial round wood generated (PwC 2017). The BC industry average includes information for all of BC, so it is not a fair comparison to the coast due to its lower m³/ha on average, however it is still worthwhile to note (PwC 2017; NRCAN 2018). The higher number of jobs generated relative to volume harvested in small scale tenures shows that woodlot licences can provide more or equally as many benefits to the provincial and local economy as industrial tenures do.

This difference in jobs generated can be explained by economies of scale, and by other indicator results, where we find that WLs are operating in sensitive terrain, actively engaging community members in management decisions and investing in

intensive silviculture and other land-based activities; all of which can demand higher levels of human resources. As well it must be noted that although WL have a higher FTE job/1000m³ coefficient than industry, WL's cannot replace industry due to the size and availability of the licences.

Indicator 2 measured cash and in-kind contributions made by WLs to the local community and demonstrates the distribution of economic benefits locally. Each WL has unique priorities in terms of where they donate their time and money. Many woodlot licences personally donate firewood to local institutions such as daycares, community centers, and events. Multiple WL holders wrote about holding trail building workshops and recreational opportunities within their licence. Others have served on the board for the North Island Woodlot Association and/or the Federation of BC Woodlot Association. In total, respondents donated \$58,500 dollars in the reporting year, making an average of \$3,900 per licence. Woodlot licences support their local economy Through these monetary and time donations. Additionally, they aid woodlot licences in achieving the a social licence to operate, meaning the acceptance and approval by local communities and stakeholders of tenures holders plans and operations.

Woodlot licences supply logs on the open market to major industry and to small and medium sized mills and value-added manufacturers. In so doing, they strive to support the full spectrum of milling and manufacturing facilities. Results showed that WL logs on north island are sold to a variety of buyers. 50% is sold through a log broker supporting larger saw mills, whereas the remaining 50% is sold to local mills, OSB mills, raw exports, and personal mills (Ex: woodworkers and local construction). The varying streams of revenue for woodlot licences show that they are able to diversify their sales and can withstand the boom-bust cycles that often happen in the lumber

market (Bliss and Kelly 2008).

Similarly, woodlot licences can be flexible and respond to local and regional demand. As a long-term tenure, they also have the potential to provide a secure source of fibre to manufacturers and value-added businesses that are already established or are seeking the right conditions like fibre flow to invest in a BC community.

In terms of markets for waste and residue, because of the relatively small volume harvested per year, most respondents sell/give the remaining slash to local firewood salvagers.

Indicator 6, economic diversification, shows the degree to which woodlot licences generate income from NTFPs. The results show that while 43% of respondents manage for NTFPs, Christmas tree plantations were the only NTFP to be reported as generating an income, and only by two respondents. Licence holders explained reasons for not getting more involved in producing NTFPs as limited markets as well as high workloads for limited revenue. Though NTFPs can provide alternate revenue streams, the small size of woodlot licences, and the amount of time and work to begin producing NTFPs is usually too high for woodlot licences to break into the market.

SOCIAL INDICATORS

Social licence is a large part of what it means to manage small scale tenures, especially woodlot licences which are often located close to urban areas. Social licence to operate (SLO) refers to the ongoing acceptance of a tenure holders standard management practices and operating procedures by its employees, stakeholders, and public (Moffat et al. 2015). Indicator 7, community accountability, measures how woodlot licences listen to local opinions and keep their local communities informed on

current management plans and operations. All respondents to the survey reported that they communicated with over six different groups in the last reporting year. The most commonly engaged with groups included firewood salvagers, property owners, hunters, and environmental groups, because these are the groups that use the tenure area most often. Others included recreation groups, tourism, chamber of commerce and other natural resource-based companies. Woodlot licences use personal and interactive ways to inform the public about management and future operations, most commonly reported way included woodlot tours and open houses. additionally, they all use more than two methods of communicating in the last year. By communicating in person with community groups woodlot licences gain acceptance and approval by their local community (achieving social licence) of the planned and current operations on the tenure (Moffat et al. 2015).

Giving back to the community is a significant aspect of obtaining SLO. WL's offer an opportunity to link community members to the forest and to increase the understanding of forest ecosystems and management locally (Thayer 2003). Investments in community education (indicator 8), measures the investments WL's make in education and capacity building. Close to 80% of respondents participate in community education, with close to 30% investing over 25 hours in the last reporting year to delivering educational experiences. The experiences include leading field trips for high school students, forestry student employment, the coastal silviculture committee tour, aiding in enhancing fire protections for local working groups, and operation equipment demonstrations. In hosting these opportunities, respondents have donated a total of \$11,000 in the last reporting year, an average of \$1,365 per WL.

As well as keeping the local community informed on management and

operations in the licence, and important aspect of social licence is accommodating community groups such as outdoor recreation users. In the last reporting year respondents have donated a combined \$12,500 as well as over 100 hours to support recreation in their local communities. donations to recreation included holding trail building workshops within WL's, contributions such as gravel, lumbers, and heavy equipment, and the creation of buffers surrounding trails in WLS. Survey respondents reported a combined total of 96 kms of known trails within WL's that are available for public use, averaging close to 7km per woodlot licences. This excludes resource roads that many already use for mountain biking, hiking, horseback riding, and other types of travel.

ENVIRONMENTAL INDICATORS

Woodlot licences operate in challenging areas around communities, and it's important that WL's manage their forests to protect the environment and keep local community members happy. WLs play an active role in the forest sector through harvesting. Indicator 3, cut control which allows licences to manage their AAC on a 5-year basis, measures the success of WL's meeting cut control requirements. All respondents are currently on track to meeting cut control in their current 5-year period. By maintaining the AAC, it can be assured harvest levels are being maintained at a sustainable level.

Because WLs are long-term area-based tenures, there are strong incentives for investments in the future productivity of the forest. By measuring the investments in intensive silviculture that are above and beyond legal requirements, it demonstrates the efforts made to increase the growing capacity in WLs, with the intent of increasing the

AAC over time. The combination of investments made by WLs in the reporting year resulted in \$167,000 going into intensive silviculture and resulting in 91% of forest harvested land in WLs being treated with intensive silviculture. Comparatively, in the 2017/2018 reporting year only 40% of crown land harvested in all of BC was treated with silviculture above legal requirements. The small cut block size and personal stake in regeneration of the stand encourages woodlot owners to use intensive silviculture methods on a higher proportion of their land than larger tenures.

Woodlot licences are situated in the interface between communities and wild forest lands and are uniquely positioned to aid in the coordination and the management of areas to reduce risk of wildfire. To date, the reporting WLs have collectively treated 90 ha's and invested over \$81,000 for wildfire mitigation. Funding from external sources is crucial given the urgency to reduce fire risk to rural communities, and WLs are well positioned to take on a leadership role in the planning and implementation of the efforts. A recent study shows that joint community planned fire abatement can be a highly effective method in managing and preventing future wild fires (McCaffery et al.)

Finally, indicator 11 deals with woodlot licences operating in environmentally sensitive areas. The unique form of tenure that a woodlot licence is can give managers the social licence to operate in highly constrained areas that have not been previously accessible for timber harvesting due to local opposition (Moffat et al. 2015). 25% of NIWA members have over 100 ha's of sensitive terrain within their tenure. The real potential of woodlot licences emerges when they have the capability to operate in these areas with the support of the local communities, still maintaining cut control, supplying logs to a wide range of users, and creating jobs and other benefits for their communities.

CONCLUSION

SURVEY FINDINGS

The survey results support other literature that demonstrates woodlot licences are an economically viable tenure type when located in or near rural communities. Woodlot licences are capable of generating equally as many or more jobs as large scale tenure types in the areas (proportional to volume harvested), actively play a role in diversifying the economy, set high environmental standards, and are more accepted by rural communities than large forms of tenure. From the above analysis, I personally believe WLs are an economically viable, environmentally conscious and socially accepted form of tenure when located in or near rural communities.

LIMITATIONS

Several guidelines surrounding the thesis have limited the scope and intensity of the survey and its questions. Most challenging to work within was the short time frame, which resulted in a smaller than wanted sample size, and shorter response time for survey respondents. Secondly the distance from the research area, provided difficulties in communicating with respondents. In-person communication would have been valuable with survey respondents, due to the low response rate via email for the survey. As well the distance from the study are prevented site visits and personal interviews with stakeholders or other valued perspectives surrounding B.C. woodlot licence program.

RECOMMENDATIONS

The thesis could be furthered by expanding the study area to all woodlot licences on the coast of BC, or even further by sending out the survey to all woodlot licences provincially. This would ensure that even with a low response rate, enough woodlot licences would respond to provide significant results.

As well question should be modified. Because the survey was based off of the BCCFA Indicator survey, some questions that applied to community forest agreements, did not apply well to woodlot licences.

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