Western Forestry Contractors' Association
WFCA

CATALYST
RESEARCH GROUP

SILVICULTURE LMI RESEARCH REPORT

FINAL REPORT, AUGUST 2021

Canada

British Columbia

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CONTENTS

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EXECUTIVE SUMMARY

Purpose of the Project

The Western Forestry Contractors' Association engaged Qatalyst Research Group to:

- Undertake research on the composition of the labour force and workforce development issues related to recruitment and retention. This document is the final report summarizing the results of that research.

- Develop a labour market strategy for the silviculture industry that is focused, pragmatic, actionable, and supported by the industry and other key stakeholders. The sectors of the BC economy that are associated with silviculture include nurseries, tree-planting, brushing & spacing, consulting foresters, and wildfire fighting. The strategy will be developed in the next phase of the project.

Overview of the Report

This report presents the results of:

- **A literature and document review** which summarizes available information related to the characteristics of the sectors, employers, employees, and occupational groups, the outlook for the industry in BC and the key factors driving growth, and key trends and issues facing the industry.

- **A survey of 84 employers in the sector in BC**. The response rate was higher amongst larger employers. We estimate that the employers who were surveyed accounted for 37% of the companies, 64% of projected full-time equivalent (FTE) employment, and 66% of projected peak employment in the industry in 2020.

- **Conducted a survey of 907 active and former employees in the industry.** It was not possible to develop a list of employees in the industry. Instead, we used several mechanisms to reach employees including working to promote the survey through various websites and social media sites; approaching employers asking them to invite their employees to participate in the employee survey; and asking employees who have completed the survey to recruit others.

- **Conducted 17 interviews with key informants who are familiar with the labour market associated with the target sectors and occupations.** The key informants included 15 representatives from industry (major employers) as well as representatives from the WFCA and BC Forest Safety Council.

The results of the literature review and document review are provided in Chapter 2, the results of the employer survey are presented in Chapter 3, and the results of the employee survey are presented in Chapter 4. A summary of findings by research question is provided in Chapter 5.

Selected Findings By Research Question

Question 1: What is the current size, composition and characteristics of the labour market and workforce for BC's silviculture sectors, including silviculture nurseries, tree planting, wildfire fighting, stand management (brush and spacing), and consulting foresters?

We estimate that 228 silviculture employers were active in BC in 2020. In developing this estimate, we first compiled a population list of 368 employers. After attempting to contact each employer, we excluded 140 employers who could not be contacted, indicated the business is no longer active, have no employees, or indicated that they are not part of the silviculture industry, leaving a final population of 228 employers.

The 228 silviculture organizations active in BC employed an estimated 3,934 people on an FTE basis in 2020 with peak employment reaching 10,152. This projection excludes BC Wildfire Services which employs 1,600 seasonal personnel each year, including firefighters, dispatchers and other seasonal positions. The 228 silviculture organizations active in BC generated about $550 million in revenues in 2020 and paid $291 million in wages.

Tree planting is the largest segment within the BC silviculture industry. It is difficult to estimate employment by sector because almost three-quarters (72%) of the employers reported that they have FTE employees active in more than one sector. Two options for estimating employment by sector were used, which provided similar estimates. We estimated that tree planting accounted for 46% of the FTEs, forestry consulting accounted for 19%, nursery operations accounted for 17%, wildfire fighting accounted for 8%, brushing and spacing accounted for 6%, and other activities accounted for 4%.

The BC silviculture industry consists of a highly diverse group of companies, which is reflected in a wide range of occupations within the industry. As expected, tree planter is the most common occupation in the industry. Almost two-thirds of employees in the industry are male and about 90% are employed seasonally.

Question 2: What are the major drivers of workforce demand for BC's silviculture sectors, including nurseries, tree planting, wildfire fighting, brushing and spacing, and consulting foresters over the next five to 10 years? What is the outlook for the sectors?

Employment in the BC silviculture industry is growing primarily as a result of growth in existing employers, as opposed to new businesses entering the industry. On an aggregate basis, employers reported that their FTEs have increased by 18.1% over the past five years (an average of 3.4%) and are expected to increase by 16.5% over the next five years (an average of 3.1%).

Employers most commonly attributed growth to changes in overall industry revenues (identified by 81% of employers), the market share held by their company (57%), the range of products or services they provide (47%), the scope of their operations (36%), and productivity (19%). Industry growth has benefitted from increased investments in reforestation in response to record breaking fire seasons, the impact of the Mountain Pine Beetle, and climate change. Although projected planting levels are forecasted to decline somewhat over the next five years relative to 2020, the projected level of seedlings planted remains higher than in the previous four years (2016-19).

Recent and projected growth in employment varies by sector. For example, employers in the wildfire fighting sector indicated that employment declined by an average of 4.3% over the past five years and projected employment would grow by 9.5% over the next five years. Employment in wildfire fighting can vary widely by year, depending on the level of fire activity. Over time, it is anticipated demand will increase as global warming contributes to an increased risk of forest fires.

Employers in the forestry consulting sector, including forestry professionals who carry out research, develop plans, and administer programs related to the management and harvesting of forest resources, indicated that employment grew by an average of 2.9% over the past five years and projected employment would grow by 8.0% over the next five years. The employers attributed the outlook for growth to increasing demand for services (as forests become more actively managed), a broadening of the range of products and services they offer and increased market share.

Question 3: What are the key labour market and employment, social, environmental and economic trends affecting the silviculture industry?

Recognition of the importance of forests in fighting climate change as well as the importance of effective forest management for ecosystem health is creating new opportunities for the silviculture industry. The critical role of forests in maintaining ecosystem health and climate stability moved reforestation objectives to the top of the global climate change agenda. A recent study by an international research team from Switzerland argues that the world can support a 25% increase in forested areas. In Canada, reforestation has become one of the important strategies towards achieving its climate goals. The Province of BC and the Government of Canada committed $290 million to the Forest Carbon Initiative to help the province meet emissions reduction targets through "activities such as reforestation, fertilization, and tree improvement". Canada ranks amongst the top 20 nations in the world in terms of reforestation initiatives[1].

Managing wildfire and other forest disturbances is going to remain a priority for governments. Extreme weather conditions, including increasingly hotter summers, are expected to require better preparedness with respect to wildfire management. New initiatives are being funded to investigate opportunities to de-escalate future forest fires while strengthening development of a forest-based bioeconomy in BC.

[1] https://www.uniguide.com/countries-planting-the-most-trees/

Stagnating contract prices impact both the profitability of the industry and wages. Forty percent of employers identified improving the profitability of companies in the industry as a major priority. They noted a need to ensure payment rates keep pace with inflation (some expressed concern that a concentration of market power on the buyer side is driving down prices, which can lead to lowering of quality and labour standards).

There is also a recognized need to revisit the structure of contracts. This was particularly important for wildfire contractors who are expected to invest in order to meet BCWFS training standards, with no guarantee of work. In response to uncertainty regarding demand, particularly after two seasons with low levels of fire activity, some contractors are moving to other lines of work, raising concerns about whether firefighting capacity will be there when needed.

Question 4: What has been the impact of COVID-19 on the silviculture industry?

Designated an essential service, the silviculture industry experienced a successful 2020 season featuring a record number of trees planted and no Covid-19 infections. Forestry and silviculture services were included in the March 26, 2020 list of essential services. Operations were allowed to continue provided that all infection prevention control plans and protocols were followed. New training was developed quickly, and adjustments were made to operating procedures, practices and standards in areas such as accommodation, meals, and hygiene measures. Workflows and schedules were reorganized, travel outside of camp was limited, and new positions were created (e.g., infection control coordinators).

Ninety percent of employers reported that COVID-19 increased the costs associated with their field operations. Key informants reported that, apart from a very few instances, contractors and workers committed to working together to make the necessary changes, maintain strong communications, and emphasizing health and safety. Some noted the support from WFCA was crucial in supporting the contractors and working closely with government to ensure a successful season.

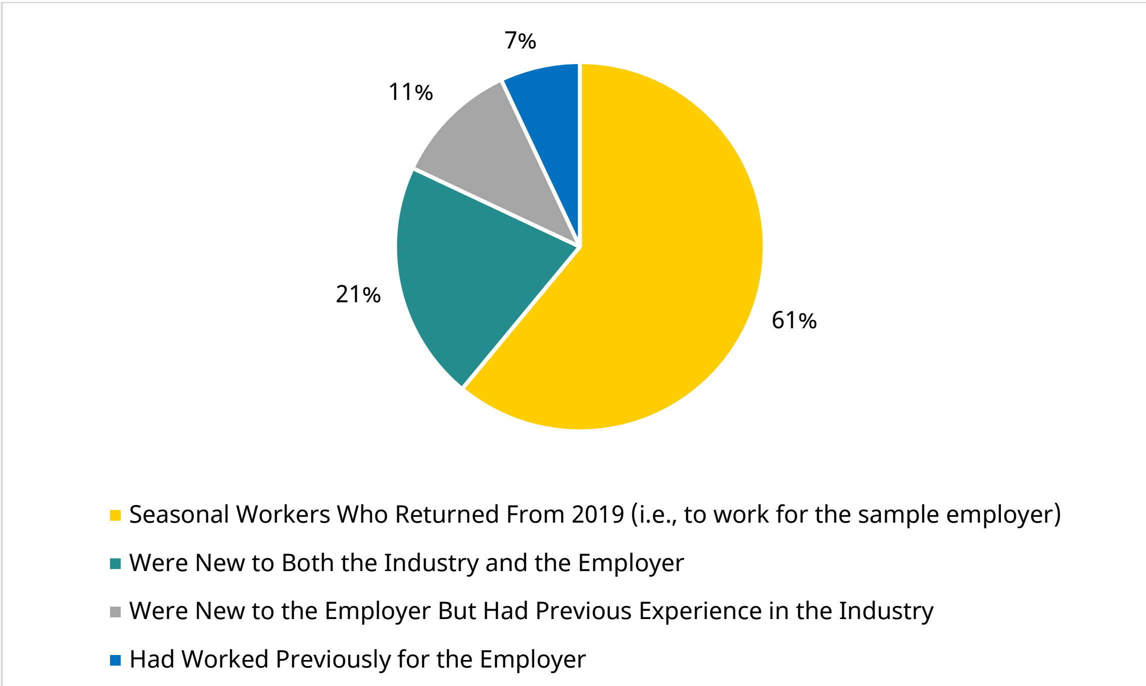
The impact on employees was mixed. Some welcomed the new health measures and flexibility, as well as the opportunities to be out in the field while most people were confined to the cities due to travel advisories or restrictions. However, many field workers also reported increased stress, isolation, concerns about losing wages due to getting sick or having to quarantine, and mental health concerns.

Both employees and employers felt that aspects of COVID-19 have created a positive legacy in terms of contributing to lasting improvements in health and safety and opening up new opportunities for remote work.

Question 5: What, if any, issues (e.g., awareness, nature of the work, work and workplace issues, income) are constraining the ability of the industry to recruit and retain workers in BC? What recruitment and retention strategies are being used effectively by employers and in the sector to recruit, develop and retain workers?

The industry is dependent on its ability to attract a steady stream of new employees, particularly for its field positions. As illustrated in the chart below, of the field workers employed in 2020, 61% were seasonal workers who returned from 2019 (i.e., to work for the sample employer), 7% had worked previously for the employer, 11% were new to the employer but had previous experience in the industry, and 21% were new to both the industry and the employer. Employers use a variety of strategies to create awareness of their employment opportunities, of which recruiting through existing employees is most common.

Field Workers by Previous Experience with Employer



Most employees are satisfied in their experience in working with their 2020 employer and their experience in working in the industry overall. Relative to other sectors in which they might work, employees saw the relationships with co-workers, the wages, their ability to do the work, and the setting as the major advantages of working in the industry. Commonly identified disadvantages included the working conditions, unpredictability as to how much work will be available, the transient or mobile lifestyle, the seasonality and physicality of the work, and the opportunities for advancement.

The primary reasons why employees leave the industry include a desire to find better opportunities for career advancement and less physically demanding work, the seasonal nature of the work, and opportunities in other sectors. Key informants noted that the ability of the industry to attract and retain workers will depend in large part on the industry's ability to pay highly competitive wages.

Other key issues facing the industry identified by employees and employers included the need to increase access to resources for mental health, better address harassment and bullying in the workplace, improve adherence to employment standards, and improve health and safety measures.

Question 6: Are there current and projected shortages for silviculture workers in BC? If so, in what sectors and types of positions (i.e., roles and responsibilities) are the shortages projected to be most acute?

COVID-19 may have made it easier for employers to attract workers for the 2021 season. At the time of the survey, most employers had not experienced (or did not anticipate experiencing) significant difficulties in filling positions for 2021. This year may be an anomaly in that many industries faced significant uncertainty regarding how their demand for employment would materialize as Canada emerges from the pandemic. Sectors such as accommodation, tourism and the food and beverage sector, which are major employers for youth, were among those most impacted by the pandemic. The uncertain outlook in these other sectors likely increased the appeal of the silviculture sector to youth in 2021.

Employers in wildfire fighting, forestry consulting and nursery sectors were those most likely to identify difficulties in attracting workers for the 2021 season. When asked about shortages, wildfire fighting contractors identified the need for both experienced and certified firefighters as well as entry level staff. Forestry consultants noted difficulties in attracting experienced professionals as well as field engineers, project managers and field staff interested in working towards professional certifications. Nurseries identified a mixture of recent college and university graduates in forestry and horticulture, seasonal leads and machine operators, and new and experienced nursery workers and labourers as employees that are difficult to attract.

Question 7: In what manner and to what extent are the training and skills development needs of the industry being met? What are the key gaps that need to be addressed?

Almost all employers with staff provide at least some form of training for their staff. Employees generally find this training to be useful to them. The most common types of training are health and safety training and onboarding/orientation training for new employees. Somewhat less common are multi-day technical training taken by employees from outside sources, technical workshops or seminars on topics relevant to particular positions, and formal mentoring programs. Education and training programs for positions that require specific education, training, designations and certifications are generally perceived by employers as effective. Those employing forestry consultants were most likely to reported that technical skills and critical thinking are in short supply, and ability to work independently. This is impacting training costs and turnover for forestry consulting companies.

Medium and larger sized employers also provide some form of training to prepare workers who are interested in moving into supervisor, crew chief and management roles in the organization. The most common types of management training include mentoring; health and safety training; in-house training or webinars in management, operations and leadership skills; on-the-job training (e.g., starting with smaller crew with Job shadowing or coaching); external courses in management/supervisor training; and technical training (e.g., driving training).

1. INTRODUCTION

1.1 Western Forestry Contractors' Association

The Western Forestry Contractors' Association (WFCA) is an association of contractors who provide all levels of pre- and post-harvest planning and implementation services to the forest industry. The WFCA was established in 2017, through a merger of two organizations with a long history of supporting forestry contracting business in BC:

- The Society of Consulting Foresters was founded in 1968 as a division of the Association of BC Forest Professionals and had an original mission to raise the profile of forestry consultants, improve standards of work, and to increase opportunities in contracting work with government.
- The Western Silvicultural Contractor's Association was formed in 1984 with a focus on advocating for effective policies for the stewardship of the province's forest resources.

The merging of the two organizations into WFCA created one unified system, a more comprehensive voice for the members and brought more resources and long-term stability through combined membership and funding. The WFCA focuses on the following:

- Communication – provides regular communication and press releases about industry issues and events including annual conferences and staging international conferences on wildfire.
- Business practices – advocates for sound, appropriate regulations and standards (labour and contracting standards) and establishment of value-based business practices.
- Forest Policy - advocates for high professional standards such as professional compliance certificate development, review of professional reliance standards and input into BCTS structure and policy framework.
- Safety – actively participates in the Forest Safety Council and advocate for implementation of safety programming and training for the industry.

1.2 Purpose of the Project

The Western Forestry Contractors' Association engaged Qatalyst Research Group to:

- Undertake research on the composition of the labour force and workforce development issues related to recruitment and retention; and
- Develop a labour market strategy for the silviculture industry that is focused, pragmatic, actionable, and supported by the industry and other key stakeholders. The sectors of the BC economy that are associated with silviculture include nurseries, tree-planting, brushing & spacing, consulting foresters, and wildfire fighting.

Funding for this study is provided through the Canada-British Columbia Labour Market Development Agreement's Sector Labour Market Partnerships (SLMP) Program administered by the Ministry of Advanced Education, Skills and Training.

Several factors contributed to the decision by the WFCA to develop the labour market strategy, including:

- **The previous labour market strategy was designed to cover the period 2015 to 2020.** In 2014, the BC Silviculture Workforce Initiative completed a labour market project which produced the *BC Silviculture Labour Market Information and Training Needs Analysis Report* and the *2015 – 2020 Human Resource Strategy*. At that time, the workforce was estimated at 7,766 workers including tree planters, brushers and spacers, wildfire suppression/fuels management workers, and administrative/ officer workers.[2]

- **Increasing demand for reforestation workers.** The largest reforestation effort ever in BC (about 305 million seedlings) moved ahead in 2020, despite the COVID-19 pandemic. The size of the industry has increased significantly since 2014, largely as a result of increased investment. The Province of BC and the Government of Canada committed $290 million to the Forest Carbon Initiative to help the province meet emissions reduction targets through "activities such as reforestation, fertilization, and tree improvement".[3] Healthy forests help stabilize the climate and regulate ecosystems and play a key role in carbon sequestration and sustainable growth. Increasing threats to BC's timber supply due to climate change related forest fires have also required new investments in fuel management and wildfire fighting capacity.

- **Changes occurring in the industry.** For example, COVID-19 has had a significant impact on the recruitment, development and retention of silviculture workers and has increased the need to enhance safety guidelines and practices to prevent and control transmission of the virus.

- **Lack of secondary data available on the size and characteristics of the labour force in the industry.** Access to relevant labour market data is constrained by the way in which the industry sectors (NAICS) and occupations (NOC) are defined. In the NOC codes, silviculture workers are mixed in with other types of forestry workers in NOC 8422 and with other types of nursery and greenhouse workers in NOC 8432. Similarly, employers are mixed in with other types of organizations providing support activities for forestry in NAICS 11531 and with other scientific and technical consulting services in NAICS 54169.

1.3 Overview of the Two Project Phases

The labour market strategy will be developed in two phases. This report represents the output from

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[2] The scope of the 2015-20 Strategy did not include silviculture nurseries or consulting foresters.

[3] https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resources-climate-change/natural-resources-climate-change-mitigation/forest-carbon-initiative

Phase 1 of the project.

Phase 1

Phase 1 has focused on researching (collecting, compiling and analyzing) labour market information (LMI) that can be used to deepen understanding of workforce issues. The key questions on which the first phase has focused include:

1. What is the current size, composition and characteristics of the labour market and workforce for BC's silviculture sectors, including silviculture nurseries, tree planting, wildfire fighting, stand management (brush and spacing), and consulting foresters?

2. What are the major drivers of workforce demand for BC's silviculture sectors, including nurseries, tree planting, wildfire fighting, brush and spacing, and consulting foresters over the next five to 10 years? What is the outlook for the sectors?

3. What are the key labour market and employment, social, environmental and economic trends affecting the silviculture industry?

4. What has been the impact of COVID-19 on the silviculture industry?

5. Are there current and projected shortages for silviculture workers in BC? If so, in what sectors and types of positions (i.e., roles and responsibilities) are the shortages projected to be most acute?

6. What, if any, issues (e.g., awareness, nature of the work, work and workplace issues, income) are constraining the ability of the industry to recruit and retain workers in BC? What recruitment and retention strategies are being used effectively by employers and in the sector to recruit, develop and retain workers?

7. In what manner and to what extent are the training and skills development needs of the industry being met? What are the key gaps that need to be addressed?

Phase 2

The second phase will focus on development of the labour market strategy. The draft strategy will be prepared in October 2021 and the strategy will be finalized in November 2021. The strategy will define:

- Key priority labour market issues on which the strategy will focus.

- Specific strategic directions, tactics and actions that will be pursued to address these issues.

- An implementation plan and budget for implementing the recommended actions. For each major action, the plan will define timelines, allocate responsibility, and estimate the resources required for implementation.

- Proposed sources of funding for implementation, including how available government funding could be leveraged with resources from other sources. The plan will also outline how the strategy, key actions and results can be sustained over time.

- Key risks to implementation and what steps can be taken to mitigate these risks.

- A performance measurement strategy (PMS) for measuring the effectiveness of the strategy in addressing the labour market issues. The PMS will define the expected outcomes of the strategy and outline the specific indicators, data sources and methodologies that will be used to measure and report on the progress made.

1.4 Work Completed in Phase 1

The following steps were undertaken to prepare the LMI report in Phase 1:

- **Established and conducted a series to meetings with the Steering Committee.** The Committee confirmed the scope of the project, provided input into key questions and issues to be addressed as well as the methodology, and reviewed the project deliverables.

- **Developed a methodology report and communication strategy, instruments, and data collection tools**. The methodology report defined the purpose of the project, the research questions. study methodology, intended deliverables and timelines, and the analytical framework. The analytical framework stipulated how the information collected from employer and employee surveys, key informant interviews, and secondary data sources would be used to address each of the research questions.

- **Conducted a literature review and environmental scan.** A report was prepared which summarized available information related to the characteristics of the sectors, employers, employees, and occupational groups, the outlook for the industry in BC and the key factors driving growth, and key trends and issues facing the industry.

- **Developed of a database of employers active in the BC silviculture industry.** The population list drew from a variety of sources such as a list of WFCA members, non- members identified by the WFCA, an internet search focused on consulting foresters and nurseries, a list of employers developed at the time of the last employers survey in 2013, and suggestions and referrals from members of the Steering Committee. We also submitted a Freedom of Information Request to WorkSafeBC to obtain lists of registered employers associated with the sectors.

  We initially developed a combined list of 368 employers. We attempted to contact each employer, first through a series of emails and then by telephone follow-up. Eventually, we excluded 140 employers who could not be contacted (e.g., telephone not in service) or indicated the business is no longer active, has no employees, or is not part of the silviculture industry, leaving a final population of 228 employers. This figure may be overstated in that one cannot assume that, just because the invitation did not bounce back and we were able to leave voice mail, that the business is active and has employees.

- **Conducted a survey of 84 employers in the sector in BC.** In total, 95 employers began the online survey but we included only 84 respondents in the final tabulations.

  Based on the population of 228 employers, the 84 respondents represent a response rate of 37%. Of those who did not complete the survey, 11 started the survey but answered only a small number of questions[4] while 68 informed us by telephone, email, or unsubscribing to the invitation or reminder letters that they were unwilling to participate which ended communication with them.

  The 228 employers and 84 respondents were coded into sectors within the silviculture industry based on categories used by WorkSafe BC. As indicated, the response rate varies from 59% amongst the tree planters to a low of 21% amongst the wildfire fighters. After seasons of comparatively few wildfires, it may be that many of the wildfire fighting contractors did not respond because they have not been very active in the sector.

Employers Surveyed By Primary WorkSafeBC Classification

Status			
Sector (WorkSafeBC Classifications)	**Surveyed[5]**	**Population**	**Percent**
Wildfire fighting	13	63	21%
Tree Planting or Cone Picking	32	54	59%
Brushing and Weeding or Tree Thinning or Spacing	11	40	28%
Consulting Foresters	15	36	42%
Ornamental Nursery or Floral Field Production	12	22	55%
Other (e.g., Field Work Services)	1	13	8%
Total	**84**	**228**	**37%**

In comparison, 46 employers participated in a 2013 industry survey and 26 participated in a 2014 industry survey. These surveys informed development of the previous labour market strategy.

Because of a higher response rate amongst larger employers, the coverage of the industry in terms of employment is much higher than the overall response of 37%. As an illustration, through our Freedom of Information Request to WorkSafeBC, we obtained payroll data for employers who reported BC payrolls totalling over $400,000 in 2020. Of the 84 employers surveyed, 39 had a payroll over $400,000 in 2020. These 39 employers accounted for 68% of

[4] We followed-up on any individuals who partially completed multiple times to encourage them to complete.
[5] Sector totals add to more than the industry total because some employers are active in more than one sector.

the aggregate payroll of the employers in the population of 228 employers who reported payrolls of over $400,000 to WorkSafeBC.

It should be noted that, in the survey, most employers (61 of the 84) indicated that they have FTE employees active in more than one sector. The following table shows the total number of employers active in each sector as well as the number of employers that identified each sector as the largest sector in which they are involved (in terms of FTE employment). As indicated, 49 of the 84 employers surveyed were involved in tree planting, including 38 who indicated that it was the sector that accounted for their largest number of FTEs).

Number of Employers Active By Sector

Largest Sector in Terms of FTEs	All Sectors in Which They Are Involved						
	TP	FC	BS	WF	FN	SP	Other
Tree Planting (TP)	**38**	10	23	5	0	2	16
Forestry Consulting (FC)	5	**19**	3	2	0	5	9
Brushing & Spacing (BS)	5	1	**6**	1	0	1	2
Wildfire Fighting (WF)	1	2	2	**5**	0	0	3
Forestry Nursery (FN)	0	2	0	0	**13**	0	8
Site Preparation (SP)	0	0	0	0	0	**0**	0
Other (Other)	0	0	0	0	0	0	**3**
Total	**49**	**34**	**34**	**13**	**13**	**8**	**41**

It should be noted that not all employers were asked or answered all questions. As such, the number of respondents may vary somewhat by question. The number of respondents is clearly identified for each question. Of the 84 respondents, 77 provided detailed quantitative data. The questionnaire was lengthy and detailed (the average response time was over 48 minutes amongst those who completed the questionnaire). At a confidence level of 95%, the sample of 84 employers who completed or substantially completed the survey achieves a margin of error of about ±8.5%.

- **Conducted a survey of 907 current and former employees in the industry.** It was not possible to develop a list of employees in the industry. Instead, we used several mechanisms to reach employees including:
    - Working to promote the survey through various websites and social media sites (mostly Facebook) associated with the sector and its employers;
    - Approaching employers asking them to invite their employees to participate in the employee survey;
    - Asking employees who have completed the survey to help recruit others.

To encourage participation, we provided a series of prizes totalling $2,000. As indicated below, the employees most commonly found out about the study from a current or former employer. Other common sources included being referred by a friend or colleague, seeing a posting on Replant.ca, or seeing a posting on a social media site (usually Facebook accounts). The other included receiving an email or phone call on the survey or hearing about the survey at the WFCA 2021 Conference.

How Employees Found Out About the Survey

Response	Employees Surveyed	
	#	%
Referred by a current or past employer	569	63%
Referred by a friend or colleague	71	8%
Saw a posting on Replant.ca	75	8%
Saw a posting on a social media site	172	19%
Other	50	6%
Total	**907**	**100%**

In comparison, 741 employees participated in the 2013 survey and 697 participated in the 2014 survey.

- **Conducted 17 interviews with key informants who are familiar with the labour market associated with the target sectors and occupations.** The purpose of these interviews was to obtain input regarding the major drivers of future employment growth, current labour market conditions and projected future conditions, skill shortages, strategies used to attract, develop and retain workers, available training, and recommendations regarding actions that could be taken to address various industry issues. The key informants included 15 representatives from the industry (major employers) as well as representatives from the WFCA and BC Forest Safety Council.

1.5 Structure of the Report

Chapter 2 provides a preliminary overview of the characteristics, outlook and issues associated with silviculture industry in BC based on the results of the literature review. Chapter 3 summarizes the results of the survey with employers while Chapter 4 summarizes the results of the survey with employees. Chapter 5 uses the major findings of the research, including the literature reviews, surveys and key informant interviews, to address each of the research questions for Phase 1 outlined in Section 1.3.

2. PROFILE OF SILVICULTURE INDUSTRY

Canada is the third most forested country in the world with over 347 million hectares of forest land (2020)[6], of which approximately 60 million hectares are in BC[7]. The BC forest industry is highly regulated and carefully managed to protect wildlife and fish habitat, soils, water and recreational opportunities. A sustainable quote or allowable annual cut is determined independently and based on detailed technical analysis and public input.[8]

The forest sector continues to be important for B.C.'s economy. The sector consists of separate but inter-connected activities such as planning, planting, and forest management; roadbuilding and harvesting; wood product manufacturing (primary and secondary); pulp, paper and bio-refining; and forest product marketing. In 2019, the forest sector was responsible for 27% ($11.9 billion) of B.C.'s exports; the sector is the primary employer in many parts of the province. Forestry-related activities in BC directly support over 7,000 businesses and employ more than 50,000 people.[9]

Silviculture impacts the management, composition, health, quality and sustainability of forests. Silviculture practices are used to manage forests for stands and timber as well as managing for wildlife, water, recreation aesthetics, or any combination of these or other forest uses. Silviculture management strategies and practices have evolved over time through use of spatial (map) data and sophisticated GIS analysis. This has allowed for more forward-looking approaches and development of different scenarios based on data on harvesting and silviculture practices. This integrated and iterative process results in learning about the resources and managing fire risks and full range of resource values, opportunities and emerging trends.

2.1 Reforestation and Nurseries

Reforestation and nurseries represent core activities for successful management of forests. Currently about one third of the seedlings planted in the province are funded directly by the provincial government through BC Timber Sales (BCTS), the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) and joint funding agreements with the federal government to restore lands lost to wildfire and to sequester carbon to mitigate climate change. Licensees plant roughly the other two-thirds of the reforestation program through their legal and financial obligations to plant and tend harvested land to free growing. They are reimbursed for that work through offsets to the stumpage they pay to the Crown. Besides reforesting stands, government and licensees may engage in rehabilitation and regeneration activities such as spacing, pruning, fertilizing and commercial thinning[10].

[6] https://www.nrcan.gc.ca/our-natural-resources/forests-forestry/state-canadas-forests-report/how-much-forest-does-canada-have/17601
[7] https://www.for.gov.bc.ca/hfd/pubs/docs/mr/mr113/forests.htm
[8] https://www.naturallywood.com/topics/forest-management-in-british-columbia/
[9] https://www.bcfii.ca/bc-forests-and-markets/bc-forest-sector-overview
[10] Growing Opportunities: A New Vision for Silviculture in British Columbia (2009)

REFORESTATION

Silviculture reforestation related activities include:

- **Harvesting and Silvicultural Systems**. Harvesting removes the forest cover from an area in varying degrees depending on the silviculture system being used. The conventional clearcutting system removes all the trees, while the partial cutting system leaves residual trees behind. Harvesting initiates a series of silviculture processes and responsibilities. The following are the silvicultural system definitions, as per *the Acts and Regulations* governing forest practices, that are used in statistical reporting on silviculture systems:
    - Clearcut: an area greater than one ha where the entire stand of trees is removed in a single harvest.
    - Patch cut: creates openings that are no greater than one ha in size and designed to manage each opening as a distinct even-aged opening.
    - Intermediate cut: a harvest entry prior to a final harvest that leaves enough trees such that the area remains fully stocked.
    - Retention: leaving individual or groups of trees, for structural diversity, dispersed throughout a cutblock such that greater than half the total area of the cutblock is influenced by trees.
    - Seed tree: selected tree area left standing, individually or in groups, after the initial harvest to provide a seed source for natural regeneration.
    - Selection: designed to manage the area as an uneven-aged stand; by the removal of individual or small group of trees.
    - Shelterwood: trees are harvested in a series of cuts designed to achieve a new even-aged stand under the shelter of remaining trees.
    - Coppice: a regeneration method in which vegetative sprouting occurs from existing stumps and root systems.
    - Reserves: a modifier, where individual or small groups of trees are retained during harvesting for the long term, providing other values such as habitat, biodiversity, scenery, and others.

  The following table provides a summary of the area harvested by silvicultural system on crown land during the fiscal year 2019/2020.

Area Harvested in 2019/20 by Silvicultural Systems on Crown Land by Area[11]

SILVCULTURAL SYSTEMS	TFL[1]	TSA[2]	OTHER[3]	Private Land - TFL	TOTALS
Clearcut	955	14,425	4,152	3	19,535
Clearcut with reserves	9,825	97,567	8,311	3	115,706
Coppice	0	0	0	0	0
Intermediate cut	182	253	168	0	603
Patch cut	0	551	52	0	603

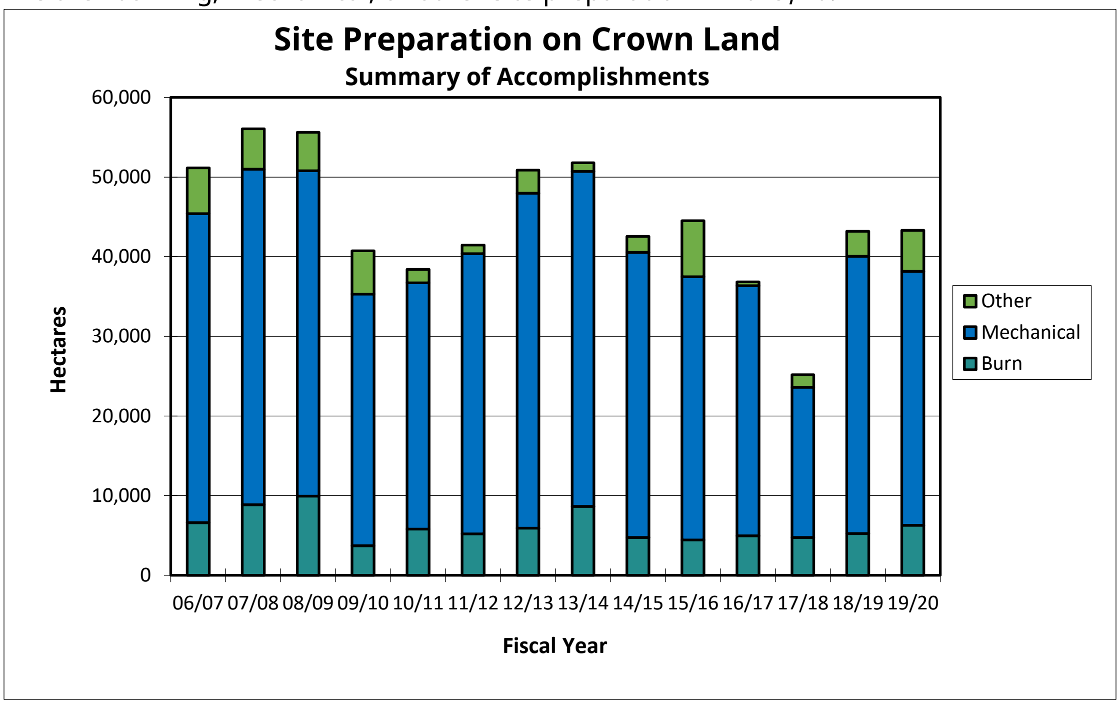
[11] Data is updated to 2019/2020 as per the information provided by BCTS

SILVCULTURAL SYSTEMS	TFL[1]	TSA[2]	OTHER[3]	Private Land - TFL	TOTALS
Retention	1,177	1,019	270	9	2,475
Seed tree	0	26	114	0	140
Selection	170	1,593	827	0	2,590
Shelterwood	0	663	12	0	675
TOTAL	**12,309**	**116,097**	**13,906**	**15**	**142,327**

Source: BC Government Silviculture Statistics – Area Harvested in 2019-20 by Silviculture System on Crown Land

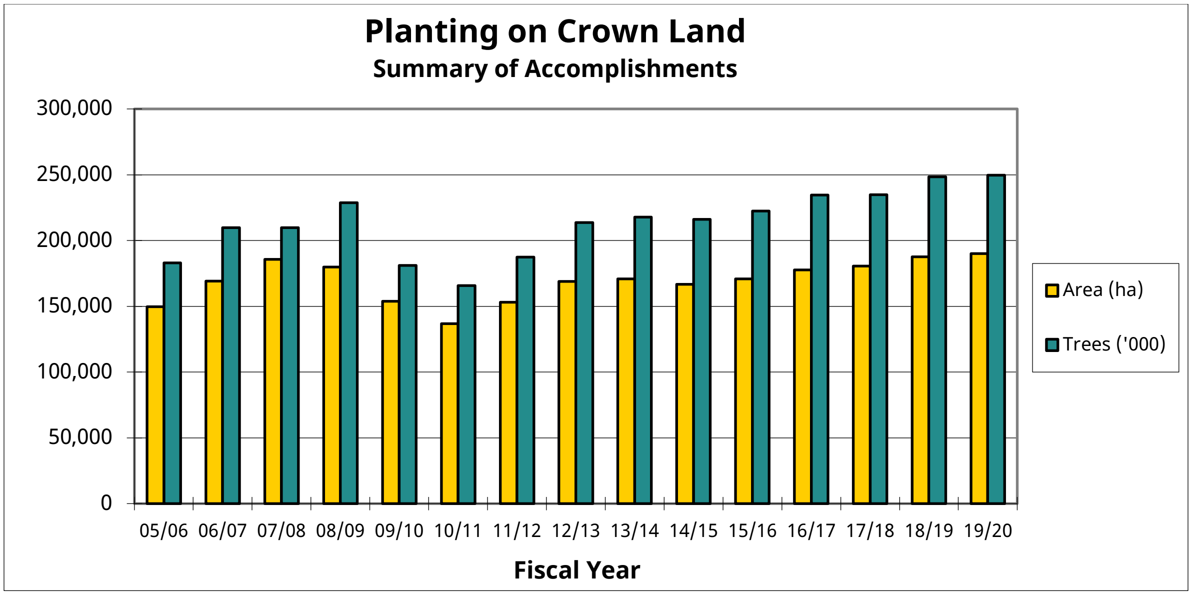
1) TFL: tree farm licence; 2) TSA: timber supply area; 3) Includes provincial Crown land within woodlot licences, community forest agreements, First Nations Woodland licenses, and from timber licences within and outside of TFL's.

- **Site preparation**. The goal is to prepare a harvested area for planting or natural regeneration through ground scarification, disc trenching, mounding, or burning. As illustrated in the following chart, there were over 43,000 ha of Crown land that underwent either burning, mechanical, or other site preparation in 2019/20.



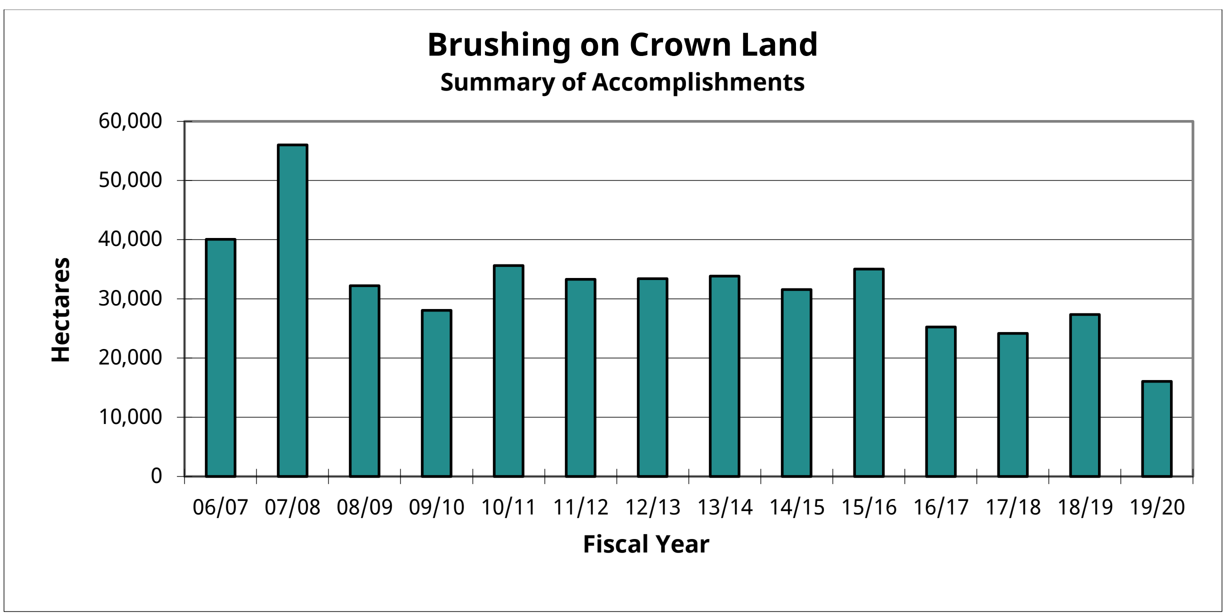
Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

- **Planting.** It ensures that a new forest is established sooner than it would have been possible through natural regeneration alone. It allows for the use of genetically improved tree seedlings and a broader mix of tree and plant species. Up to 16 conifer and 3 broadleaf species of trees are planted annually across BC. Over the last decade the number of trees planted and ha covered have been consistently increasing. Despite the COVID-19 pandemic, during the 2020 summer season about 300 million trees were planted, the highest number ever.



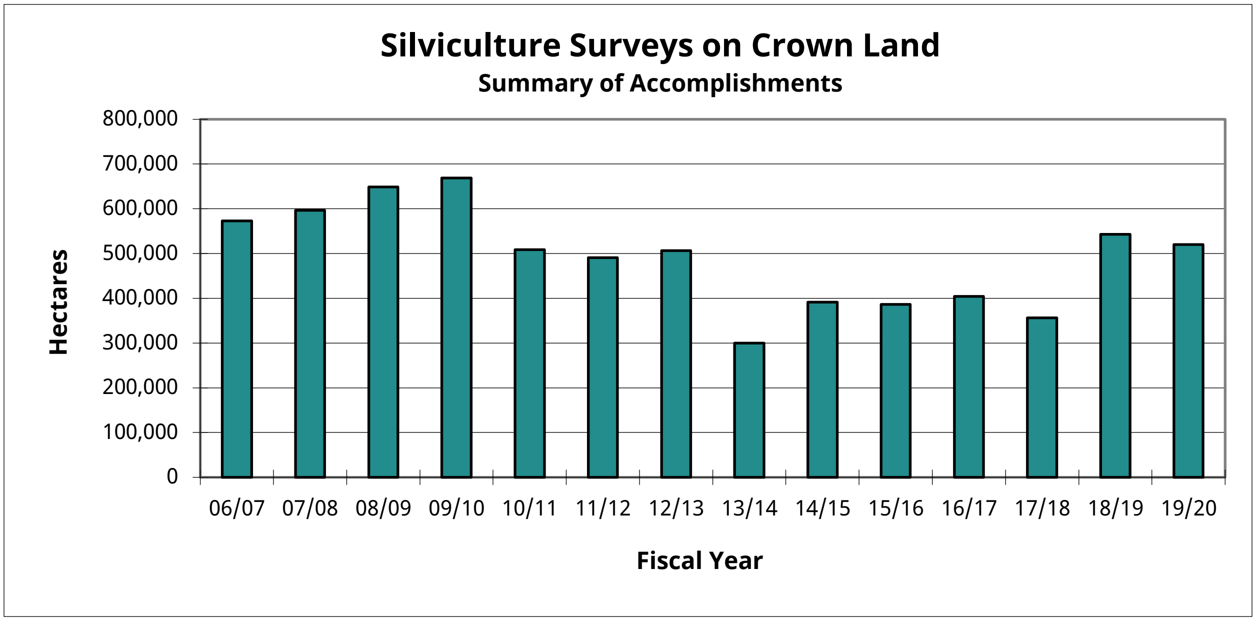
Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

- **Brushing**. Removes competing vegetation from the immediate vicinity of young trees, usually early in stand development. It frees up nutrients, water, and sunlight to increase survival, growth, and establishment of new seedlings. In 2019/20, over 16,000 ha of Crown land was brushed.



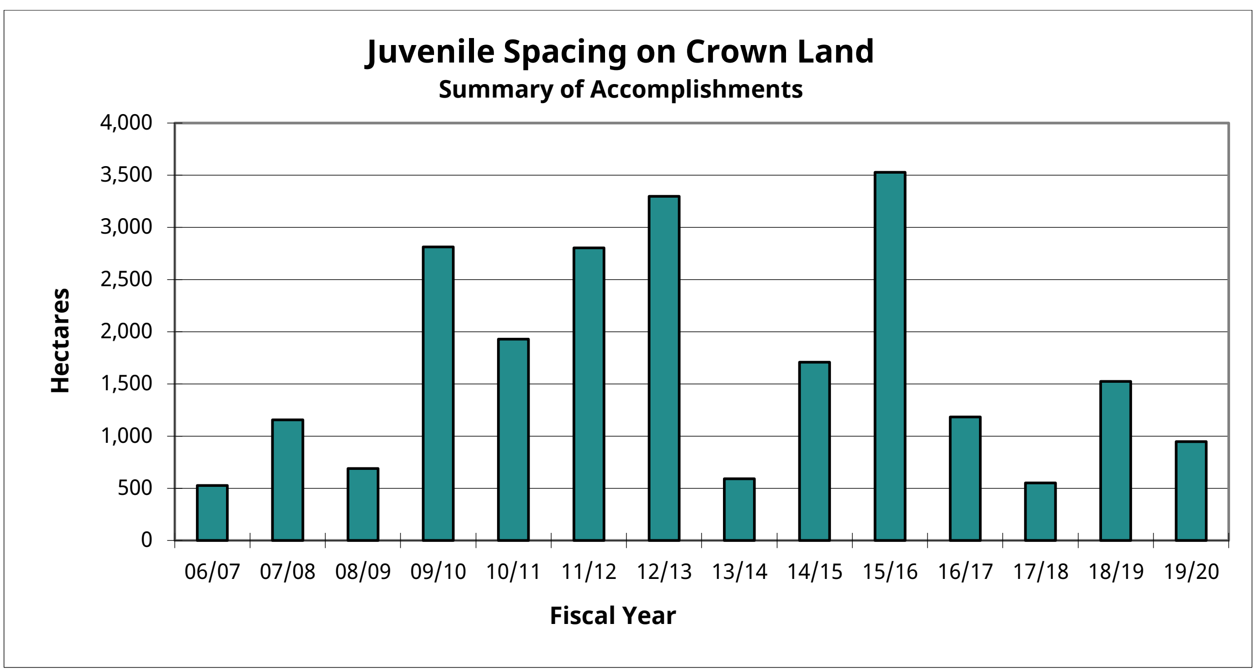
Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

- **Surveys**. Silviculture surveys range from planting and regeneration surveys to free growing status surveys, to pre-stand tending surveys for treatments like spacing and pruning. Surveys aim to assess the current status and performance of the established new forest. Data collected is used to formulate prescriptions for the next silviculture treatment and to provide stand attribute data for inventory updates. The area surveyed per year peaked in 2009/10 at roughly 670,000 ha and was just over 520,000 ha in 2019/20.



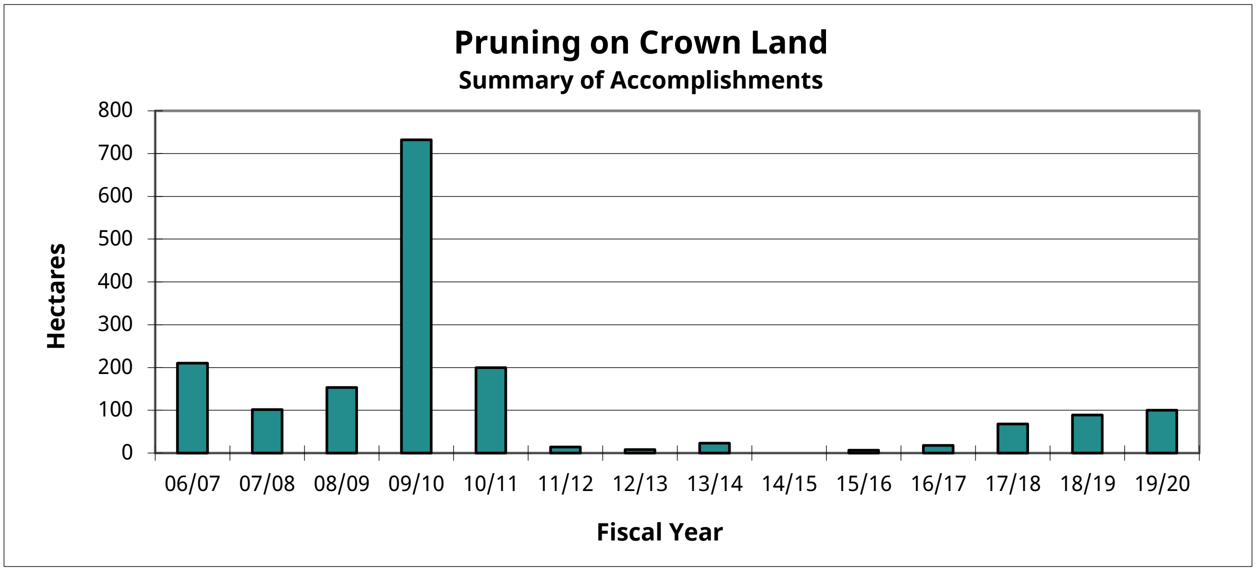
Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

- **Spacing**. Removal of selected trees from young stands is performed to reduce overall density and subsequently reduces light competition. Spacing promotes faster growth, and larger trees of uniform size and shape, which can reduce harvesting and milling costs during the next crop rotation. Spacing can also help produce healthier stands by removing diseased and damaged trees.



Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

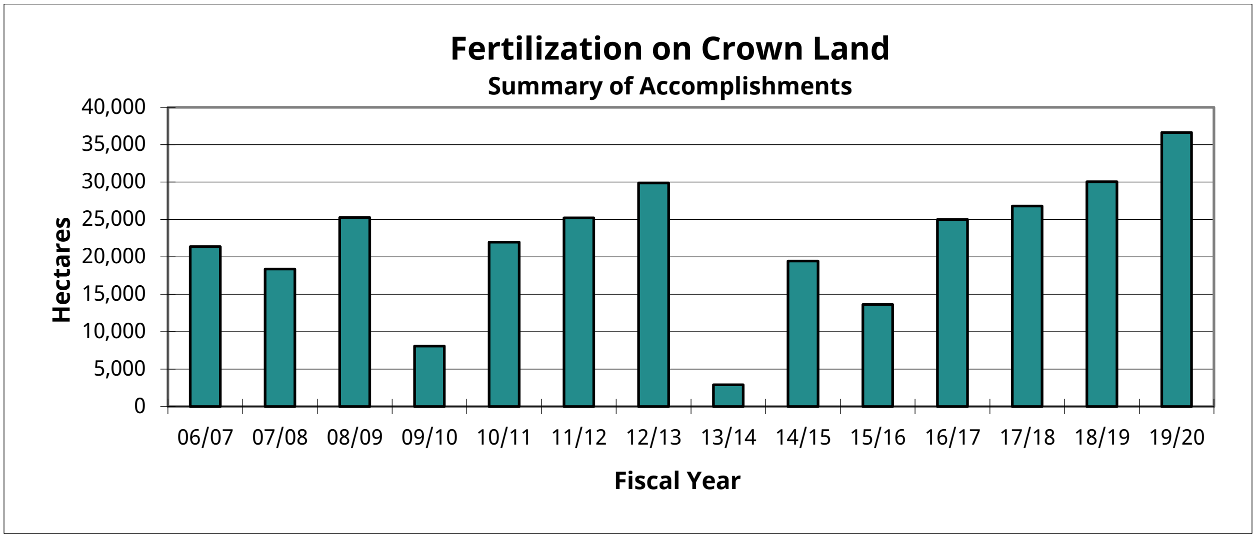
- **Pruning**. Removal of live or dead branches from the stems of trees is performed to promote production of high quality, clear wood. Pruning is typically performed on post free growing stands, usually following a spacing treatment. Uniform spacing is required in order to have uniform inter tree density for good tree crown expansion and rapid healing over cut branch sites. Pruning is also performed in minor cases, to remove diseased lower branches and produce healthier stands. The pruning coverage in 2019/20 was 100 ha.



Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting[12]

- **Fertilizing**. Used to promote tree growth on sites deficient in one or more nutrients. It can help increase the rate of growth and produce larger trees. Broadcast fertilization (either by aerial or manual methods) is usually applied on post free growing stands. Fertilization at the time of planting is a minor treatment utilized to assist with successful seedling establishment. In 2019/20, roughly 27,000 ha were fertilized, the most in more than a decade.

[12] Pruning is carried out to improve the market value of the final wood product by producing knot-free wood for the improvement of the tree or its timber. It is also be done in response to wildfires and disease control



Source: BC Government Silviculture Statistics: All Silviculture Activities and Cumulative Planting

These silviculture activities are funded through several government and private sector programs. For example, BC Timber Sales funds most silviculture activities, while the Forest Carbon Initiative funds surveying and fertilizing only. The following describes various funding programs (as well as accomplishments of each for 2019/20).

- BC Timber Sales (BCTS) manages about 20 per cent of the province's allowable annual cut for Crown land timber. BCTS manages the seed inventory and production, as well as the storage and distribution of seedlings for the reforestation of Crown lands administered by BCTS. It also supplies seedlings to reforestation programs such as Forests for Tomorrow and projects funded through the Forest Carbon Initiative. In 2019/20, over 171,000 ha were treated through various activities (mostly surveying and planting) funded by BCTS.

- Forest Stand Management Fund is a special silviculture sub-account established under the Special Accounts and Appropriation and Control Act. It provides funding for enhanced management of BC's forests and rangelands, silviculture work, and costs related to environmental remediation performed in accordance with applicable legislation. In 2019/20, nearly 4,000 ha were surveyed, and 424 ha were planted through the fund.

- Forest Carbon Initiative (FCI) was launched in 2017 in partnership with the federal government as a key action on climate change. The provincial and federal governments have committed $290 million to FCI from 2017/18 to 2021/22. In 2019/20, about 13,000 ha were surveyed and 8,500 ha were fertilized with the funding provided through the initiative.

- Forest Enhancement Society of BC funds projects that help minimize wildfire risk, enhance wildlife habitat, improve low-value forest, re-plant damaged forests, and utilize fibre that would otherwise be burned. In 2019/20, the society funded projects that surveyed over 101,000 ha, conducted site preparation of 6,500 ha, and fertilizing of 6,000 ha.

- The Government of BC, via the MFLNRORD, undertakes silviculture activities not directly associated with the Forest Stand Management Fund. In 2019/20, Ministry staff surveyed about 5,500 ha, planted 3,400 ha, and conducted site preparation of 156 ha.

- The Forests for Tomorrow (FFT) Program was established in 2005 to respond to the catastrophic wildfires of previous years, and the mountain pine beetle infestation. The program works to restore healthy forests and to mitigate the impacts of wildfire and insect outbreaks while also creating economic opportunities for forestry and bioenergy production. The program has supported silviculture activities on more than 200,000 ha of Crown land, and in 2019/20 funded roughly 180,000 ha or surveying, 15,000 ha of planting, and 19,000 ha of fertilizing.

- Private sector licences are responsible for most silviculture activities. In 2019/20, private companies surveyed roughly 86,000 ha and planted about 140,000 ha.

The following table summarizes silviculture activity accomplishments by funding source.

Silviculture Activity Accomplishments by Funding Source (2019/20) by Hectare

Silviculture Activity	BC Timber Sales	Forest Stand Management Fund	Forest Carbon Initiative	Forest Enhancement Society of BC	Provincial Silviculture Programs	Non Ministry Programs	Forest for Tomorrow	Private Sector	All Sources
Surveying	133,433	3,955	13,040	101,616	5,458	21	181,052	85,697	524,272
Preparing Sites	5,254	61	688	6,547	156	3	6,509	19,587	38,805
Planting[3]	26,849	424	0	5,982	3,362	0	15,170	137,006	182,105
Direct Seeding	0	0	0	0	0	0	0	165	165
Brushing	3,384	119	0	12	60	0	626	11,496	15.878
Forest Health[4]	1,314	0	0	3,137	11	0	221	4,181	8,864
Spacing	19	0	0	363	11	0	438	97	808
Fertilizing	792	0	8,467	5,934	215	0	18,716	2,343	36,467
Pruning	2	30	0	99	0	3	24	23	181
TOTALS	**171,047**	**4,589**	**22,195**	**123,690**	**9,273**	**27**	**222,756**	**260,595**	**807,545**

Source: Silviculture Accomplishments on Crown Land by Funding in 2019/2020 – provided by BCTS

Some of the key features that characterize BC's silviculture sectors, particularly those in reforestation, are their seasonality, extreme physical and mental demands on workers, remote and adverse working conditions, limited long term job stability due to the contracting environment, and the variety of companies and types of work - from large, labour intensive planting companies, to independent owner-operators, to highly specialized activities (e.g. helicopter forest health diagnostics) with few to no employees.

According to WorkBC, silviculture and forestry workers (NOC 8422[13]) perform a variety of duties related to the reforestation, management, improvement, and conservation of forests. Common job titles include:

- brush cutter - forestry

[13] This occupational group includes forest firefighters

- operator, clearing saw / spacing saw
- pieceworker - silviculture
- seed cone collector / picker
- tree pruner / precommercial tree thinner
- worker, logging crew / conservation

Workers find job opportunities through logging companies, contractors, and government services, depending on the specific occupation. Work usually takes place outdoors under a variety of weather conditions and temperatures. The nature of silviculture and forestry work can be physically demanding, as workers are required to bend, stoop, and crouch throughout the workday. In addition, workers are often required to carry heavy equipment and supplies and walk or move very quickly over steep and uneven terrain.

Some common requirements for silviculture jobs include the need to be physically fit, well-coordinated and comfortable on rugged terrain, self-motivated, adaptable, comfortable working in remote areas under a range of conditions, and able to apply reasoning and make decisions independently. Workers may be required to work independently with minimal supervision and should be confident in map and photo reading, compassing and distancing, identification of forest plants and trees, measuring and recording, and the operation of GPS units.

Since work is often located in remote areas, silviculture and forestry workers generally must travel and live at camp facilities for extended periods of time. As noted earlier, work in this occupational group is often seasonal, most typically in spring and summer. The workweek is typically 40 hours, with weekend shifts as required. However, workers may be required to work long hours as 10 to 12-hour workdays are common.

Some silviculture workers may be salaried employees while others, such as tree planters, are typically paid on a piece work basis. According to the 2016 Census, there were about 1,300 BC residents employed in silviculture. Of those, most (over 80%) were men and about 45% were between 25 and 44 years of age. The provincial annual median salary was $43,789 with hourly rates ranging from a high of about $31/hr to a low of about $17/hr. The 2019 BC labour market outlook[14] forecasted an overall drop-in employment growth rate over the next decade. All job openings (about 130) will result from replacement of retiring workers.

These figures are much lower than the projections developed as part of the 2014 BC Silviculture Labour Market Information (LMI) and Training Needs Report which estimated that there were 4,361 tree planters, 1,430 brushers, and 36 spacers employed in BC. This is largely because the 2016 Census Data for NOC 8422 includes forestry workers (51% are in public administration, 18% are in Manufacturing, 11% are in Professional, Scientific and Technical Services, 6% in Construction, and 3% in Repair, Personal and Non-Profit Services).

[14] https://www.workbc.ca/getmedia/18214b5d-b338-4bbd-80bf-b04e48a11386/BC_Labour_Market_Outlook_2019.pdf.aspx

SILVICULTURE NURSERIES

BC is the second largest producer of nursery stock in Canada and accounts for 30% of the national nursery trade.[15] Nursery businesses range in size from small one-person operations to highly mechanized facilities with hundreds of acres of field stock, outdoor container beds, and/or greenhouse facilities. Forest nurseries supply tree seedlings for reforestation to their clients and suppliers, including provincial and federal governments. Nurseries play an important role in producing high-quality plants that are often a critical requirement for successfully implementing forest and landscape restoration programs to create healthy, functional, sustainable, and resilient ecosystems.[16]

Silviculture nursery workers are included in the nursery and greenhouse workers (NOC 8432) classification which includes workers that plant, cultivate, and harvest trees, shrubs, flowers, and greenhouse vegetables and plants. Plant production requires specialized knowledge and attention to many important factors to be able to deliver adequate quantities of high-quality plants from appropriate genetic seed sources to land managers in a timely manner. Depending on their sector and position they may be responsible for:

- preparing growing media, plant bulbs, seeds and cuttings, graft and bud plants, setting transplants out onto the rooting media, and transplant seedlings and rooted cuttings
- spraying trees, shrubs, flowers, and plants to manage specific pests
- operating greenhouse and nursery irrigation systems
- digging, harvesting, transplanting, and preparing trees, shrubs, flowers and plants for sale and shipping
- providing information and advice to customers on gardening and the care of trees, shrubs, flowers, plants, and lawns
- operating tractors and other equipment to fertilize, cultivate, harvest, and spray fields and plants
- maintaining inventory and order materials as required

Workers may spend a large portion of their day outdoors or in climate-controlled greenhouses. According to the 2016 Census, there were 3,500 workers employed as nursery and greenhouse workers in BC. Only 18% of workers worked full-time. Most are women, and close to half are 45-64 years old. The annual provincial median salary in 2019, was $31,284, with provincial hourly rates ranging from a high of about $25/hr to a low of about $14/hr. The 2019 BC labour market outlook forecasted that there would be about 640 job openings over the next 10 years, with 90% of job openings resulting from retirement. These projections are heavily impacted by the cannabis industry.

[15] Nursery Factsheet, BC Ministry of Agriculture (2015)

[16] Hasse L.D & Savis A.S (2017). Developing and Supporting Quality Nursery Facilities And Staff Are Necessary To Meet Global Forest and Landscape Restoration Needs. REFORESTA 4: 69-93

2.2 Wildfire Management

British Columbia forests and wildlands cover nearly a million square kilometers with approximately 2,000 wildfires occurring each year. Most of these fires are contained within 24 hours. Wildfire prevention is a shared responsibility between the public, businesses, local governments, and the Government of BC. The BC Wildfire Service (BCWS) is tasked with managing wildfires through a combination of wildfire prevention, mitigation, and suppression strategies, on both Crown and private lands outside of organized areas such as municipalities or regional districts. The BCWS has a multi-pronged approach to prevention that includes education, enforcement, and engineering (i.e., planning for and implementing fuel and fire management). The BCWS is part of, and mandated by, the Government of British Columbia to:

- Deliver effective wildfire management and emergency response support on behalf of the Government of British Columbia
- Protect lives and values at risk
- Encourage sustainable, healthy, and resilient ecosystems

The following table describes the wildfire seasons in terms of number of wildfires, hectares burned, resources utilized, and total costs of wildfire suppression by fiscal year.

Wildfire Seasons Summary (Last 10 Years)

Fiscal Year	Number of Wildfires	Ha	Resources	Total Costs (millions)
2019/20	825	21,138	189 airtanker missions	$182.5
2018/19	2,117	1,354,284	270 aircraft, 4,756 personnel including 1,719 contract personnel, 961 out of province, and hundreds of staff from Canadian Armed Forces	$615
2017/18	1,353	1,200,000	4,700 personnel were engaged in fighting wildfires across BC, including over 2,000 contract personnel from the forest industry and over 1,200 personnel from outside the province.	$649
2016/17	1,050	101,325	-	$129
2015/16	1,858	280,605	310 out-of-province personnel were brought in to assist, 2,500 personnel were working both on the fireline and in support positions across the province.	$277
2014/15	1,455	360,000	A total of 1,196 out-of-province personnel were brought in to assist. At the height of the season, over 3,000 people were working both on the fireline and in support positions across the province.	$298
2013/14	1,851	18,298	Thanks to the hard work and quick response of our crews, most of these fires were contained quickly. By the Labour Day long weekend, the arrival of cool and wet weather in most areas lowered the fire danger rating and put a stop to significant wildfire activity.	$122

Fiscal Year	Number of Wildfires	Ha	Resources	Total Costs (millions)
2012/13	1,644	Over 24,500	A total of 79 personnel came from Saskatchewan, Ontario, and the Yukon to assist in our wildfire suppression efforts.	$155
2011/12	646	Over 11,000	Cool and wet conditions in the spring and early summer months resulted in minimal fire activity. The number of fire starts remained low because there was very little lightning activity.	$66.7
2010/11	100	330,000	Over 1,400 personnel assisted from out-of-province, including over 1,100 firefighters. Resources were brought in from Alberta, Saskatchewan, Manitoba, Ontario, Quebec, the Northwest Territories, the Yukon, and the United States.	$220

Source: https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary
https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-statistics/wildfire-averages

Contract Crews

In addition to a team of permanent staff that includes safety and training personnel, wildfire and fuel management experts, and support and administrative staff, the BCWS employs approximately 1,600 seasonal personnel each year. Of those, about 1,000 are Type 1 firefighters. Type 2 and Type 3 firefighters (contract crews) make up the remaining personnel (this number fluctuates significantly given seasonal fire activity) and are often called on to assist with wildfires that are lower intensity and present a lesser risk to firefighter safety (smoke, intense heat, fumes, and physical dangers exposure). This relationship is especially important during busy fire seasons when BCWS resources may be spread thin and require a significant numbers of contract wildfire fighters to manage the workload. For example, during both the 2017 and 2018 fire seasons, roughly 2000 contractors were called upon to assist the BCWS.[17]

Contract fire crews compete through a Request for Standing Offers competition to secure contracts. Standing offer contracts are typically offered in two-year increments, however, during times of heightened fire activity the province may offer short term assignments to pre-qualified crews[18]. To secure a contract a crew must fulfil the training, safety, and personnel experience requirements put in place by the BCWS. For example:

- Contract crews that secure Type 2 contracts are guaranteed employment throughout the season (May to August unless extended), and their members must meet the experience level, first aid, fire suppression and command system course certification, fitness testing, and forestry certification requirements required by the BCWS contract (see table below).

[17] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary
[18] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/employment-and-contracts/contract-opportunities/contractors

- Contract crews that secure Type 3 contracts are not guaranteed work as their contracts stipulate that work will be provided "if and when" it is available. Although the experience is not required for Type 3 wildfire fighters, they must still meet the fire suppressions course certification, first aid, and fitness testing requirements stipulated in their contracts (see table below).

Other contracted positions include first aid services, danger tree falling and assessing services, faller coordinator and danger tree specialists, fire suppression specialists, fire camp catering, and other non-emergency services such as consulting, facilitation services, GIS services, etc.

The following table outlines the requirements that must be met by Type 2 and Type 3 wildfire crews under their respective contracts.

Contract Wildfire Fighter Requirements

Requirements	Wildfire Fighter Type	
	Type 2 Wildfire Fighter	Type 3 Wildfire Fighter
Experience	▪ 35 days of fireline experience minimum for Crew Members ▪ 72 days of fireline experience minimum for Crew Leaders	▪ No experience required
Certifications/ Training	▪ OFA Level 1 + Transport Endorsement ▪ WHIMIS 2015 ▪ Transportation of dangerous goods training ▪ Courses required for Crew Members: Incident Command Systems 100 (ICS 100), Fire suppression 100 (S100), S185, S211, S212, S213 ▪ Courses required for Crew Leaders: ICS 100, ICS 200, S100, S185, S211, S212, S213, S230, S235, S241 ▪ OFA Level 3 is preferred ▪ Valid driver's license is preferred ▪ Danger Tree Assessment (DTA) training is preferred ▪ Faller certification is preferred ▪ Power saw operator training preferred	▪ Fire suppression 100 (S100) and S185 ▪ WHIMIS 2015 ▪ Valid driver's license preferred
Fitness Testing	▪ Pass the WFX Fitness Test administered by the BCWS (achieve a time of 17:45 mins or better)	▪ Annual, non-government administered fitness test (e.g. Walk 3.2km with a 25lb pack in 30 mins or less)
Re-location	▪ Type 2 wildfire fighters must relocate to the area of their home base as work is guaranteed	▪ Type 3 wildfire fighters are not recommended to relocate as work is not guaranteed. It is recommended that they are located within 2 hours of their home base, or secure flexible accommodations close to their home base.

Requirements	Wildfire Fighter Type	
	Type 2 Wildfire Fighter	Type 3 Wildfire Fighter
Crew Composition	▪ 2-4 person crews ▪ All members must have OFA 1 + transport ▪ 2 members must have OFA 3	▪ 5-person crews, including; ▪ 1 DTA certified member ▪ 1 certified power saw operator ▪ 2 members with OFA 1 + transport endorsement or OFA 3 ▪ 1 Crew Leader ▪ 2 experienced crew members (60 hours minimum)

Source: Apex Forest & Wildfire Services Ltd. (requirements for each type of employment with a major employer)

The contracting restrictions and requirements for Type 2 and Type 3 crews can make it very difficult and costly for employers to recruit and retain firefighters. Costs are associated with turn-over due to seasonality and no-guaranteed work, as well as training requirements. Contracting restrictions such as that the BC Wildfire Service will not allow contractors to add personnel to their roster after April 1 for Type 2 and July 1st for Type 3 of any given year, contributes to challenges with meeting all the requirements, particularly with respect to training, prior to the start of the season when workers may be engaged in other or different type of employment.

2.3 Forestry Professionals

According to WorkBC, forestry professionals (NOC 2122) carry out research, develop plans, and administer programs related to the management and harvesting of forest resources. Forestry consultants may work for industry, government, consulting companies, educational institutions, or other related industries. Depending on their position or title, forestry professionals can have a wide range of responsibilities, some of which include[19]:

- planning and directing forest surveys and related studies, and the preparation of reports on findings, conclusions, and recommendations.
- creating short- and long-term plans for the management of forest lands and forest resources.
- planning and directing of woodlands harvesting; road building; and programs for reforestation, silviculture, fire prevention and suppression, wildlife management, environmental protection, and insect and vegetation control.
- negotiating terms and conditions of agreements and contracts for forest harvesting, forest management, and the leasing of forest lands.
- overseeing contract compliance and results of forestry activities.
- ensuring adherence to government regulations and forest company goals.
- planning and carrying out public relations programs, and education and extension programs related to forestry.
- creating and overseeing programs for tree seedling production and woodlands nursery operations

[19] https://www.workbc.ca/careers/2122#duties

- carrying out research in the areas of tree improvement, nursery seedling production, forest soils, forest ecology, forest surveys, forest operations, and other areas.
- providing advice, recommendations and other consultative services about forestry matters to private woodlot owners, municipal, provincial, or federal governments, and forest companies.

WorkBC reported that, based on 2016 Census data, about 1,700 workers are employed as professional foresters, 64% of whom are working full time and 80% are male. Over 40% are aged 25 to 45. The annual provincial median salary, according to 2020 job bank wage data, was $77,142, with hourly rates ranging from a high of $46.70 to a low of $30.29. Jobs are forecasted to increase over the next 10 years by 360 positions, most of which (91%) will result from the retirement of current workers.

The Association of BC Forest Professionals is responsible for registering and regulating BC forestry professionals. The organization issues a number of professional designations and registrations including:

- Registered Professional Foresters (RPF) – registered members have rights to independently practice in all aspects of professional forestry.
- Registered Forest Technologist (RFP) - have rights to independently practise aspects of professional forestry according to their scope of practice. They generally specialize in on-the-ground fieldwork and perform technical forestry functions.
- Natural Resource Professionals – associate member class, may only engage in limited aspects of professional forestry that have been approved by the ABCFP Council. They generally have a conservation or environmental science background.
- Accredited Timber Cruisers or Evaluators are in the associate member class and may only engage in forestry activities related to the areas of timber inventory, appraisal, and timber supply.
- Silvicultural Accredited Surveyors – associate member class, generally involved in forestry activities related to silviculture surveys.
- Special Permit Holder status is issued to individuals who don’t have the educational requirement to become registered professionals but are deemed qualified to practise in a very limited area of professional forestry.

According to the Association of BC Forest Professional’s annual report, there were over 5,500 registered professionals, including 3,332 Registered Professional Foresters, and 1,364 Registered Forest Technologists in BC as of 2020.

2.4 Factors Driving Growth in the Industry

Projections in the 2015-2020 Strategy

A wide range of factors can impact on the outlook for the silviculture industry such as environmental concerns, land use legislation, the value of Canadian dollar, housing markets, and trade disputes. In the past, these factors impacted negatively on the level of reforestation and other silviculture activity.

The 2015-2020 HR Strategy for the Silviculture Sector predicted that future workforce demand for tree planters would decrease over the long term, primarily due to reductions in the allowable annual cut (AAC). During the 2014/15 season, approximately 243.1 million tree seedlings were planted and an estimated 4,387 workers were employed. Future demand was projected to decline to about 200 million tree seedlings planted per year for the next 10 years until 2023/24, requiring 3,609 workers annually.

The demand for brushing and spacing workers was projected to remain steady based on licensee practices and government budgets for incremental silviculture activities. The demand for wildfire fighter workers was predicted to increase due to weather patterns and fuel accumulation on the forest floor. Given the approximated future demand for workers, and the number of existing workers at the time of the study, the need for new workers was predicted to consist mostly of turnover or replacement of existing positions.

Projections Going Forward

More recently, however, a number of trends have reversed the industry outlook, resulting in higher growth and increasing pressure on human resources. These trends are discussed below:

- **Record breaking fire seasons in BC have increased demand for wildfire fighters and increased the need for reforestation**. It's been estimated that BC needed to plant an estimated 48 million more trees in 2020 than it did in the previous year in order to restore massive areas burned in the province after two record-breaking wildfires, and to promote carbon sequestration.

- **Impact of Mountain Pine Beetle (MPB)**. According to government data, the cumulative area impacted by MPB is 18.1 million hectares. Silviculture investments and strategies are one of the primary means in helping to mitigate the impacts of natural disturbances such as the mountain pine beetle.

- **Tree Planting to combat climate change**. Approximately 2.6 billion tonnes of carbon dioxide, or one-third of the CO2 released from burning fossil fuels, is absorbed by forests every year. Forest biodiversity serves as an integral part of the carbon cycle and as such plays an important role in stabilizing local ecosystems. Trees are the key barometer for gauging the health of the ecosystem[20].

A recent study by the international research team from Switzerland, argued that the world could support an additional 25% of forested areas than what we have now. Their model shows that planting more than half a trillion trees could capture about 205 gigatons of carbon and help reduce atmospheric carbon by about 25%. This would help negate about 20 years of human-produced carbon emissions at the current rate. While this is not a solution to climate change, other scientists confirmed the potential for using reforestation as one of the climate mitigations tools.21 In Canada, reforestation has become one of the important strategies towards achieving its climate goals. Political parties are promising to plant billions of trees to help the country reach carbon neutrality. For example, the Liberal government pledged to plant 2 billion more trees over the next decade.22 The Province of BC and the Government of Canada committed $290 million to the Forest Carbon Initiative to help the province meet emissions reduction targets through "activities such as reforestation, fertilization, and tree improvement".[23]

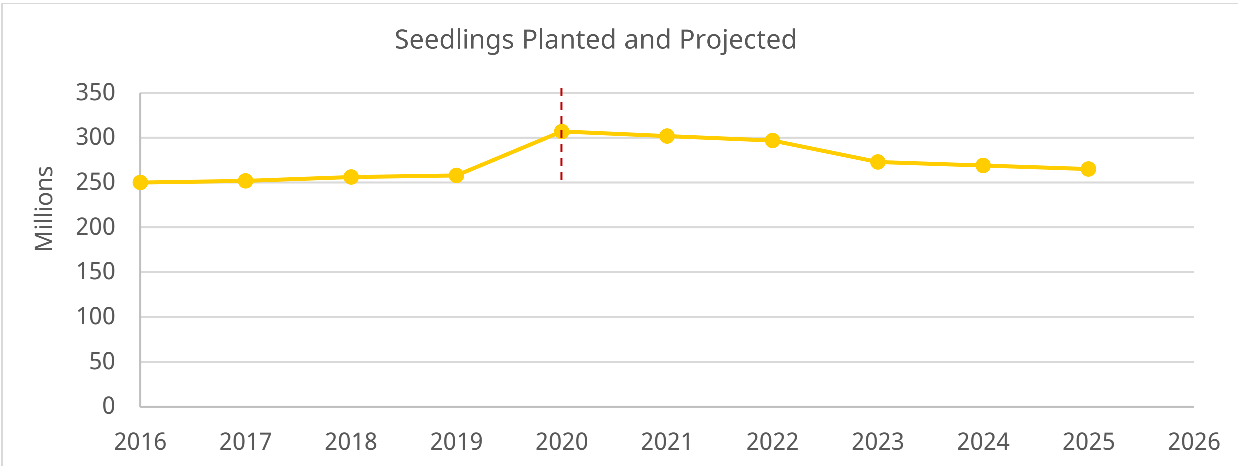
- **Plans to protect old-growth forest.** The Government of BC plan to shift from old-growth to second-growth harvesting in coastal forests involves cultivating faster-growing trees, increased fertilization and a shorter growth-to-harvest cycle.[24] This activity, as well as a planned increase in the planting and harvesting of deciduous hardwoods, would increase opportunities for silviculture workers.

- **Increased focus on forest bioeconomy**. Biomass, a term for biological material that comes from plants, including trees, is a resource of growing importance for renewable bioenergy, biofuels and other bioproducts that are increasingly replacing fossil-fuel based products. Demand for bioproduct is growing rapidly worldwide. Although the majority of biomass comes from the manufacturing residues, removal of biomass from the harvested sites and biomass plantations (fast growing willow or poplar species) are sources of energy that require careful forest planning and managing[25].

In 2019/20, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development in consultations with private sector and consulting agencies, undertook a project to estimate seedling needs using climate-based seed transfer standards and to guide long term investments in seed

[20] Forests and climate change. IUCN Issues Briefs
[21] https://climate.nasa.gov/news/2927/examining-the-viability-of-planting-trees-to-help-mitigate-climate-change/
[22] https://www.cbc.ca/news/canada/british-columbia/tree-planters-shortage-climate-change-1.5170853
[23] https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resources-climate-change/natural-resources-climate-change-mitigation/forest-carbon-initiative
[24] https://news.gov.bc.ca/releases/2020FLNR0058-001711
[25] https://www.nrcan.gc.ca/our-natural-resources/forests-forestry/forest-industry-trade/forest-bioeconomy-bioenergy-bioproducts/13315

orchards[26]. At that time, provincial demand was projected to drop from 308 million seedling in 2019 to 280 million over the next 4 years (2020-2024), and below 250 million in long term. Although the projected planting levels were forecasted to drop over the next five years, the projected level of seedlings planted remains higher than in the previous 4 years (2016-19).



Source: https://wfca.ca/wp-content/uploads/2020/08/WFCA-2020-Summit-Presentation-Lorne-Bedford.pdf

A recent presentation at the 2021 Western Forestry Contractors Association conference reported preliminary data for 2020 and a forecast for 2021.[27] This preliminary data for 2020 indicated that about 304 million trees were planted in 2020 and estimated that 301 million would be planted in 2021.

2.5 Key Trends and Issues

The literature review identified a number of key trends and issues affecting the industry, which are highlighted below.

Harassment

The issues of harassment and bullying in the industry were raised in the 2015 Human Resources Strategy. The early reporting of harassment led to WFCA setting up a panel for the 2017 annual conference that included victims of workplace abuse and harassment who bravely described their experiences. The invited speakers included two women tree planters who described how few of their employers had effective codes of conduct or systems in place to deal with workplace discrimination and violence. The women told of not only having to shoulder the hard work, but too often having to brace themselves against sexism and sexual harassment.[28] The remote location and

[26] FLNRORD Seedling Projections by Brendan Brabender, Neil Hughes & Lorne Bedford, Resource Practices Branch

[27] Reforestation in BC 2020 and onwards, Presentation at the 2021 WFCA Conference by Neil Hughes RPF, Resource Practices Branch, Ministry of Forests,

[28] WFCA Annual Conference 2017

isolation of workers, mentally/emotionally challenging work, camp setting, vulnerable workers (young and diverse workforce), revolving door of industry participants, and lifestyle (parties, alcohol, drugs) are factors that contribute to the vulnerability of the sector for such incidents to occur.[29,30]

New accounts of sexual harassment were reported in various media outlets. In 2019, Northern Society for Domestic Peace launched the survey soliciting feedback from those who may have witnessed or experienced sexual harassment or assault in the tree-planting industry. More than 70 planters, mostly women and some men, reported their experiences of harassment and sexual violence.

In response to these revelations, WFCA and the sector's BC SAFE Forestry Program (BCSFP) have prioritized sexual harassment and assaults as key issues related to health and safety in the industry. Some examples of actions taken to address these issues include:

- Working with the social service agency Northern Society for Domestic Peace (NSDP) in supporting their efforts to educate workers in camps regarding preventing sexual assault and harassment in their remote work camps, understanding consent, and supporting others. WorkSafeBC and the BCSFP are jointly funding the agency to make training videos for workers. Hundreds of BC tree planters participated in the workshops. Airika Owen of the Northern Society for Domestic Peace, who developed sexual safety workshops to address harassment said that the response to the workshops has been very positive, noting: "Even though it is at the end of their day and they are exhausted, and it is often rainy and muddy and mosquito infested. They are not being paid to sit through it. It's not the ideal delivery model for training. But they have been super engaged, super polite, happy to have us there"[31].

- BC Forest Safety assisted the BCSFP in 2020 in developing tree planting supervision training that would include instruction to reduce bullying and assault risks to workers. Frontline supervisors play a critical part in setting examples and preventing workplace harassment and violence. BCSFP is working with employers to gather the best practices and other attributes that make respectful and violence-free workplaces to produce guidelines for employers for improving their own prevention and investigation plans. The BC SAFE Forestry Advocate, Dr. Tesluk, held regional workshops throughout the province for owners and supervisors to address industry safety issues including bullying and assaults.

A key aspect of harassment prevention is the continued development and implementation of policies and training for tree planters and their managers within their organizations. Policies serve as behavioural guidelines, and employees are typically informed of them before they start with the company. If an issue occurs, supervisors can refer to the company policies rather than being

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29 Replant.ca forum discussion on sexual harassment
30 Workplace Harassment Guidelines for Employers, Presentation at 2018 WFCA Conference by Robin McCullough and Jordan Tesluk
31 CBC: B.C. tree planters get training in sex assault prevention at remote camps, published May 27, 2019.

perceived to make a personal judgement. All employees will hear about the company's expectations regarding a variety of issues such as health and safety, emergency response procedures, drugs and alcohol, protocols for working alone, and interactions with wildlife. Ultimately the prevention of harassment and procedures to address it start with a respectful workplace and the WFCA has committed to coordinating this issue at a company and industry level to establish higher standards of care and conduct. For example, a regional BC SAFE Forestry forum in Courtenay included a workshop aimed at training for supervisors and crew leaders for early intervention to prevent harassment and assault.

Diversity of Work Force

According to the Canadian Institute of Forestry (CIF),[32] of the roughly 200,000 forest sector workers in Canada, roughly 17% are women, 9% are visible minorities, 12% are immigrants, and 7% are Indigenous (with some overlap between categories).

Gender

Greater representation of women in the forestry sector is considered as one of the best solutions to attract more young women to the industry. However, it presents a 'Catch-22' in which the solution is denied by a circumstance inherent in the problem. Suggestions to make the sector more attractive to women include, more publicity and marketing, and the creation of a more accepting environment for women.[33] In order to facilitate a more inclusive culture as a step towards achieving better business outcomes and being more innovative and agile, the *Gender Equity In Forestry National Action Plan Initiative* was launched in November 2018 by the Canadian Institute of Forestry in collaboration with the Centre for Social Intelligence. These two organizations lead a National Steering Committee of Gender Champions drawn from industry, government, indigenous organizations, NGOs, and academia.[34] This three-year project involves the creation of a *National Action Plan* that will promote gender equity across Canada's forest sector. This is Canada's first public-private funded national gender equity project, and it aims to create a diverse and inclusive work force.

The National Action Plan has a framework with three main pillars of action:

- Building the Evidence Base: leveraging existing data to identify gaps and establish a baseline of information on gender representation across the sector.
- Fostering an Inclusive Culture: developing several discrete products including a *Resistance Strategy* (a plan to eliminate resistance), identifying best practices from leading companies from around the world, as well as creating an advocacy toolkit to advance gender equality in the forest sector.

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[32] Statistics Canada 2017, https://www.cif-ifc.org/gender-equity-in-canadas-forest-sector-initiative/

[33] The "Catch-22" of Representation of Women in the Forest Sector: The Perspective of Student Leaders in Top Global Forestry Universities, Pipiet Larasatie, Taylor Barnett and Eric Hansen, *Forests* 2020, 11, 419; doi:10.3390/f11040419

[34] https://www.cbc.ca/news/canada/thunder-bay/forestry-institute-national-actionplan-1.4970592

- Repositioning the Sector: advocating measuring and reporting on progress toward gender equality through targeted communications and developing new branding that welcomes diverse and inclusive cultures.

While the gender composition of upper and middle management may be shifting, Silviculture Canada estimates that roughly 30% of the tree planting labour force is female. Some companies claim that nearly half of their silviculture workforce is female.[35]

Indigenous Representation

The trends in BC's Indigenous population present opportunities for labour supply in the forestry industry, including silviculture. The Indigenous population grew by 42% between 2006 and 2016, with Indigenous youth, between ages of 15 and 34, growing by 39% compared to 6% for the same group among non-Indigenous population.[36] According to the 2016 Census, the total population of Aboriginal peoples (First Nations, Metis, and Inuit) in BC was 270,585. Of those 53,150 lived on-reserve, a 4% increase since 2006. The median age was 33. The top three occupations were in sales and services (24%), trades, transport and equipment operator and related (16%), and education, law and social, community, and government services (16%). Nearly two-thirds of those living on-reserve, have high school education (23%) or less then high school (37%). The unemployment rate was 22%.[37]

The 2017 study for the BC Council of Forest Industries (COFI) reported that 5,315 Indigenous people were employed directly by the BC forest industry, accounting for 9% of the jobs in the industry. BC's forestry industry employs more Indigenous peoples than any other resources sector.[38] Similar data is not available for Silviculture sector specifically.

The BC First Nations Forestry Workforce Strategy reported that First Nations stakeholders and government set a target of filling 2,200 forest sector jobs over the next 10 years. To increase First Nations' participation and awareness of the sector, the strategy recommended that following actions should be taken:[39]

1. Wellness, Health and Safety – Ensuring access to wellness supports and workplace health and safety competence before, during, and after forestry-related education, training, and employment.
2. Education and Training - Increasing access to and completion of relevant forestry-related education and training and occupational certification among First Nations people, including expansion of internships.
3. Career Promotion – Increasing promotion and awareness of forestry careers and training opportunities among First Nations people.

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35 https://www.agreforestation.ca/tree-planting.html
36 A British Columbia First Nations Forestry Workforce Strategy, 2018. BC First Nations Forestry Council
37 https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/infogrph/infgrph.cfm?LANG=E&DGUID=2016A000259_OnR&PR=59
38 https://www.cofi.org/forest-facts/
39 A British Columbia First Nations Forestry Workforce Strategy, 2018. BC First Nations Forestry Council

4. Recruitment – Increase recruitment, matching, placement, and onboarding of First Nations in the BC forest industry.
5. Retention and Advancement – Increasing and expanding supports and retention for First Nations people in forestry-related education, training, and employment, and providing opportunities for them to progress and advance within career pathways.
6. First Nations Business Development – Promoting and supporting First Nation people's entrepreneurship and self-employment in forestry business activities.
7. Labour Market Information – Ongoing monitoring and assessment of labour market supply, demand, and gaps.

In December 2020, the Forestry Council announced a new partnership with the BC Wildfire Service through the Indigenous Forestry Scholarship Program. The Program offers Indigenous youth training and employment opportunities in the forest sector and its sub-sectors. [40]. The BC Wildfire Services encourages Indigenous applicants to apply through The Indigenous Applicant Advisory Service. This is a new service available to all Indigenous applicants (First Nations, status or non-status, Métis, or Inuit) seeking to work in the BC Public Service.[41]

Foreign Workers

In 2017, Temporary Foreign Workers accounted for 15.5% of the employment in agriculture, forestry, fishing, and hunting[42]. Although it is possible for non-Canadians to get a work visa and become a tree planter, non-Canadians are less desirable to employers. This is largely because most tree planting is piece work, and people get faster and better each year, so companies look for employees who have the potential to keep planting trees for several years. Most work visas are limited to a maximum of two years of work within Canada, which makes them less desirable to hire for seasonal work.[43]

IMPACT OF COVID-19

In the early days of the pandemic, major health and safety concerns were about whether tree planters, who work in close quarters in remote and rustic camps, would be safe amid the spread of the virus. Many Indigenous communities where workers would normally shop and spend time did not want visitors. The BC government, BC Timber Sales, licensees, and the WFCA collaborated to develop plans for safe working conditions.[44] Forestry and silviculture services were included in a March 26, 2020, list of essential services due to provision of wood, pulp, paper, and soft-pulp products used to make medical supplies, such as protective masks, drapes, and screens. At the end of March 2020, employers began mobilizing crews from around Canada, thawing trees, booking

[40] New Partnership between First Nations Forestry Council and BC Wildfire Service, 15 Dec 2020 by BC First Nations Forestry Council https://www.forestrycouncil.ca/blogs
[41] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/employment-and-contracts/employment/wildfire-fighters
[42] StatsCan: The distribution of temporary foreign workers across industries in Canada
[43] http://www.silviculturecanada.ca/treeplanting.html
[44] Burns Lake 2020 Interior planting starts after COVID-19 delays, *Burns Lake News*, May 6, 2020.

transport, and setting up camps or other types of lodgings.[45] The 2020 tree planting season was given the green light to proceed by the provincial government at the end of April 2020.[46] It was a record year for tree planting in BC with over 300 million seedlings planted by about 5,000 field workers without a single COVID-19 infection. The success of the season can be attributed to the efforts and sacrifices of workers and contractors.

Impact on Contractors

Provincial health officers issued an order on April 23, 2020, setting out COVID-19 prevention, control, and inspection protocols for industrial camps and guidelines for the silviculture sector. [47] The BC CDC guidelines for the silviculture sector required:

- screening of workers for COVID-19 symptoms or potential exposure;
- added hygiene measures in camps, including hand washing stations;
- training workers on staying safe while traveling to camp and worksites;
- food preparation guidelines;
- limiting travel outside of camp, and;
- having at least one infection and control coordinator at each site.

MFLNRORD Minister Doug Donaldson stated that all tree planting employers would be required to implement an infection prevention control plan for work camp locations, including field camps and hotel/motel accommodations, and submit these plans to the ministry. Forestry camps, accommodations, and worksites were to be inspected by provincial prevention and control officers to ensure correct implementation of obligatory health and safety measures.

The typical tight quarters experienced by planters while living in work camps and gathering in tents for meals, as well as riding in trucks to get to their work sites were no longer allowed. Modifications included staggering meal schedules for workers and restrictions for off-duty hours. Requiring camps to run seven days per week requires additional staffing.

An example of the level of detail to which workflow had to be reorganized can be found on the Folklore Contracting website. Two weeks prior to arrival at the camp, workers were obliged to fill out mandatory Daily Active Monitoring Forms for at least 14 days while following physical distancing guidelines as well as to compile trip plans. Camp sizes had to be reconfigured and a 6-day pre-season schedule was developed. Folklore committed to completely keeping its workers out of Prince George with workers being forbidden to even stop in Prince George en route to camps, not even to pick up food if the camps were not ready. Every camp hired at least two more people to

[45] "Chief forester calls for delayed start to tree planting season", by Arthur Williams, *Prince George Citizen* March 31, 2020.
[46] "5,000 tree planters heading to B.C.'s forests, despite pandemic", by Betsy Trumpener, CBC News, April 24, 2020.
[47] Guidelines for Silviculture Worker Camps During the COVID-19 Pandemic, April 22, 2020, BC Ministry of Health and CDC.

help meet the additional demands, primarily helping with food prep, cleaning/sanitizing, and running laundry to town.

It is estimated that the COVID-19 safety measures increased contractors' costs by as much as 20% with the same safety provisions likely to be included in negotiations for contracts in 2021. Contractors had to innovate to ensure that their crews remained more isolated than ever. Roughly half of the 5,000 workers came from outside BC and were required to satisfy two-week isolation periods. Crews were assigned to limited "pods," security was hired to ensure workers didn't stray into town when overnighting in hotels. Some contractors provided outdoor pool tables, internet access, or other recreational opportunities for workers confined to camps in off-duty hours.[48]

In July 2020 the federal Department of Natural Resources announced the federal government's contribution of up to $30 million to offset additional costs associated with COVID-19 safety measures for SMEs in the forest sector, including tree-planting operations.[49] The investment was intended to cover extra costs for things like sanitizing stations, additional accommodations and/or transportation, facilities and services to maintain social distancing, and personal protective equipment.

The regulations created significant financial risk for contractors in terms of potentially having a camp shut down and not being paid for unplanted trees. Tree planting companies also faced the prospect of having to pay workers who were forced into isolation due to suspected COVID infection. Typically, planters do not get sick pay. In late April, the Ministry of Forests deferred the stumpage fees that lumber producers must pay to the province for three months. To qualify, they were required to continue to meet their reforesting obligations and thus could pass some of those savings on to the contractors[50].

Impact on Tree Planters

The fact that BC was able to have a record tree planting season without any COVID cases is a real credit to the tree planters and their commitment to having a successful season. The ED of the WFCA, John Betts, said, "*A lot of credit needs to go to our workers…as a result of them taking this quite seriously, we managed to get through the season without anyone testing positive for COVID, which is in itself quite an accomplishment*."

While one of the attractions of tree planting as a summer job is the off-duty socializing, 2020 saw tree planters off duty hours governed by physical distancing regulations even in shared tents. Planters were only allowed close contact with a handful of people assigned to their "work pods". As

[48] https://www.theglobeandmail.com/canada/british-columbia/article-bc-plants-a-record-number-of-trees-this-year-despite-the-pandemic/
[49] https://www.canada.ca/en/natural-resources-canada/news/2020/07/emergency-funding-for-covid-19-safety-measures-in-forest-operations.html
[50] "Tree planters bracing for months in the bush as pandemic keeps them out of towns", by Mark Nielsen, May 7, 2020, *Prince George Citizen*

noted above, tree planters were essentially locked down in their remote camps and forbidden from socializing amongst each other or visiting neighbouring communities on their days off[51].

Major employers warned their workers not to arrive early to the region where they will be planting, and to stay away from cities, towns, and Indigenous communities as a condition of employment.[52] Planters were also told to bring everything to camp that they might need for the entire duration of their first contracts (toiletries, duct tape, gloves, boot laces, etc.). The only people allowed to leave camps were town runners who, in addition to doing laundry deliveries, would attend to planter's requests based on priority.

The new regulations and restrictions likely had a negative impact on some planter's already low net wages due to additional expenses such as laundry costs. For example, in some camps, laundry costs were deducted from individual pay with each laundry load expected to cost between $15 and $25. All employees were also asked to put on a clean shirt before getting into the truck at the end of the day. Conversely, for workers in some companies like Brinkman who supplied food to camps, food costs were lower as the planters did not have to buy their own food in town[53].

There were some positive unintended impacts of the new restrictions imposed on planters staying in work camps. Not only did no one get sick from COVID-19, but other illnesses that usually plague work camps, such as flus and gastrointestinal infections were also absent. Workers also got more sleep leading to fewer illnesses. However, hardships associated with the isolation of work camps took a mental toll compounded by heavy rain all summer long which, while good for seedlings, didn't do much to lift the spirits of people unable to go into town to take a break.

The effect that the pandemic has had on the experience of tree-planters in 2020 will be seen in the upcoming planting season. On one hand, the increased restrictions and lower net wages may deter some of the potential labour force. On the other hand, the economic fallout from the restrictions on the economy and the soaring unemployment rates in 2020 may reinforce the labour supply.

In September 2020, the federal government made a commitment[54] that Canada would join more than 84 countries in putting nature at the centre of COVID-19 economic recovery plans (around 28 million trees planted in BC were federally funded with a similar commitment for 2021). There is currently uncertainty around 2022 commitments as funding commitments are needed in advance to ensure enough seedlings for future planting seasons.[55]

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[51] https://www.cbc.ca/news/canada/british-columbia/bc-tree-planting-season-saved-despite-covid-fears-1.5544254
[52] https://www.brinkmanreforestation.ca/coronavirus-update
[53] WorkSafeBC Magazine, Sept.Oct 2020
[54] https://www.leaderspledgefornature.org/
[55] Joint provincial-federal funding from the Low Carbon Economy Fund as well as the federal government's $3 billion commitment to plant two billion trees over the next 10 years.

3. SURVEY OF EMPLOYERS

3.1 Description of the Employers

Of the 84 representatives of employers in the silviculture industry who were surveyed, 77 employers provided detailed employment and financial responses. In a few cases, more than one representative from a company responded to the questionnaire. In those situations, we combined their responses into a single company response to avoid double counting. The data reported by the employers who were surveyed is presented in this chapter. In Chapter 5, the results of the surveys are combined with other sources of data to develop projections regarding the size of the silviculture industry overall.

The characteristics of the employers that provided employment and financial data are as follows:

- **Most of the employers have been in operation in BC for more than 20 years.**

  As indicated, only 10 of the 77 businesses have been operating in BC for less than 10 years.

Employers by Years of Operation in BC

Years of Operation in BC	Employers Surveyed	
	#	%
Fewer than 5	4	5%
5 to 9	6	8%
10 to 14	2	3%
15 to 20	14	18%
Over 20	51	66%
Total	**77**	**100%**

- **Of the 77 employers, four also have offices in other parts of Canada and two have operations outside of Canada**.

  In total, these employers reported having 119 offices in total, of which eight were in other parts of Canada and five are outside of Canada.

Permanent Offices by Location

Permanent Office(s) Location	Offices		Employers	
	#	%	#	%
Permanent Offices in BC	106	89%	77	100%
Permanent Offices Outside BC	8	7%	4	5%
Permanent Offices Outside Canada	5	4%	2	3%
Total Offices/Total Employers	**119**	**100%**	**77***	**100%***

**Not mutually exclusive as an employer may have multiple offices in different regions.*

Of the four employers with operations outside of BC, three are involved primarily in tree planting, and one in forestry nurseries. Five of the 77 employers also indicated that their BC office had done work outside of BC in 2020. Of these five employers, four were involved in tree planting and four were involved in brushing and spacing. The region most commonly identified was Alberta.

- **These 77 employers reported employing 2,853 full-time equivalent employees (FTEs) in 2020, of whom 2,515 (85%) were involved in their operations in BC.**

A total of 2,853 full-time equivalent employees (FTEs) were employed by 77 (surveyed) employers in 2020 across all regions, of which 36% of employers employed fewer than 10 FTEs, 44% employed 11 to 50 FTEs, 13% employed 51 to 100 FTEs, and the remaining 6% employed over 100 FTEs.

Moreover, 85% (2,515) of those 2,853 FTEs employed were involved in BC operations. The size of B.C. employment in the sector is shown in the table below. As indicated, 38% of employers employed fewer than 10 FTEs in B.C., 44% employed 11 to 50 FTEs in B.C., 12% employed 51 to 100 FTEs in B.C., and the remaining 6% employed over 100 FTEs in B.C. While most of the employers reported 100% of their FTEs were also involved in B.C. operations, 6 employers indicated that some were not involved in operations in B.C.

Number of FTE Employees in 2020 by Employers

FTE's in 2020 (across all regions)	Total FTEs		FTEs in BC	
	#	%	#	%
<5	18	23%	19	25%
5 to 10	10	13%	10	13%
11 to 25	25	32%	25	32%
26 to 50	9	12%	9	12%
51 to 100	10	13%	9	12%
>100	5	6%	5	6%
Total Employers	**77**	**100%**	**77**	**100%**
Total FTEs	**2,853**		**2,515**	
Average Number	**37.0**		**32.7**	

- **Positions associated with tree planting, silviculture nurseries, and forestry consulting operations accounted for the greatest numbers of the reported FTEs.**

As indicated below, employers reported that 47% of FTEs related to tree planting operations, 19% to forestry consulting and 17% to nursery operations. By operations, we mean all people employed in related activities (for tree planting, for example, that would include planters, other field staff, supervisors, management and related support staff).

Number of BC FTEs by Type of Operations

Operation	Employers	BC FTE's	
		FTEs	%
Tree Planting (TP)	42	1,172	47%
Forestry Consulting (FC)	30	467	19%
Forestry Nursery (FN)	10	423	17%
Brushing & Spacing (BS)	29	111	4%
Wildfire Fighting (WF)	13	73	3%
Site Preparation (SP)	8	66	3%
Other	37	203	8%
Total	**77***	**2,515**	**100%**

**Not mutually exclusive as an employer may be involved in multiple operations.*

- **Reflecting the high degree of seasonality in the industry, the peak number of people employed in the industry in B.C. is much greater than the number of FTE positions for the year**.

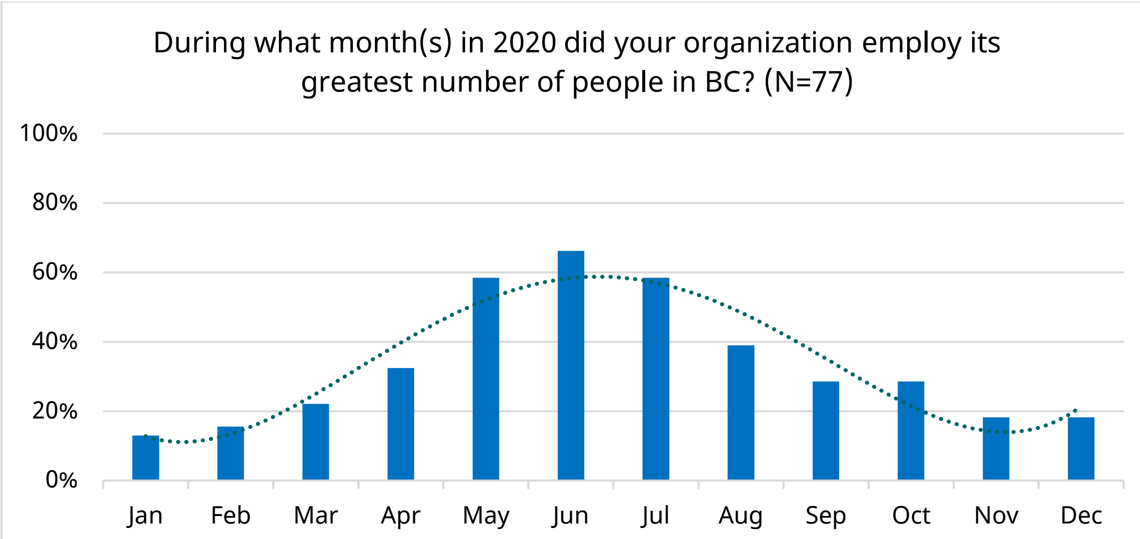
  On their busiest day of the year, the 77 employers reported a total of 6,719 employees in B.C., of whom 4,928 or 76% were field workers. As indicated in the following table, the majority (64%) of employers hired over 25 employees at peak times, including 25% who had over 100 employees on their busiest day. In terms of field workers, 51% of the employers employed over 25 field workers on their busiest day of the year, including 18% who indicated over 100 field workers.

Range in Peak Number of Employees and Field Workers By Employer

Peak BC Employees in 2020	All Workers		Field Workers	
	#	%	#	%
<5	11	14%	22	29%
5 to 10	6	8%	6	8%
11 to 25	11	14%	10	13%
26 to 50	16	21%	16	21%
51 to 100	14	18%	9	12%
101 to 200	10	13%	6	8%
>200	9	12%	8	10%
Total	**77**	**100%**	**77**	**100%**
Total FTEs	**6,719**		**4,928**	
Average Number	**87.3**		**64.0**	

- **On average, the employers reported that they had workers in the field on 157 days in 2020**.

When asked to identify the peak month or months of their operations, the employers selected an average of four months. The most commonly reported peak periods for the employers were May to August.



- **Of the peak staff, only 705 (10.5%) are employed year-round**.

The percentage varies across different positions from all senior managers, majority of administrative staff (65%) and half of the supervisors or project managers (50%) to very few wildfire fighters (11%) or tree planters (2%).

Peak Permanent and Seasonal Employment in 2020 by Position

Positions	Employers	Employees			
		Year-round	Seasonal	Total	% Year-round
Senior Managers	40	103	0	103	100%
Administration Staff	45	77	41	118	65%
Supervisor or Project Manager	39	81	81	162	50%
Forestry Consultant	26	177	239	416	43%
Other	14	21	57	78	27%
Crew Leader	34	68	354	422	16%
Spacer or Brusher	27	39	313	352	11%
Wildfire Fighter	12	21	163	184	11%
Other field staff not included above (e.g., tree runners, internal checkers)	24	9	129	138	7%
Silviculture Nursery Worker	11	47	815	862	5%
Tree Planter	39	62	3,661	3,723	2%
Cook	21	0	157	157	0%

Positions	Employers	Employees			
		Year-round	Seasonal	Total	% Year-round
Trucker	2	0	5	5	0%
Total	**77**	**705**	**6,014**	**6,719**	**10.5%**
Percent		**10.5%**	**89.5%**	**100%**	

- **According to the employers, 34% of their peak employees are female.**

  Employers provided a profile of the characteristics of their workforce on their busiest day. As indicated below, among the employers who provided data for that specific group, 34% of the employees were women, 5% were Indigenous, and 2% were Temporary Foreign Workers. In terms of professional designations, 2% of the workers are Registered Professional Foresters and 2% are Registered Forest Technologists. Of the seasonal workers employed in BC, 35% reside outside of the province during the off-season.

Involvement of Selected Groups in the Labour Force

Group	Employers Providing Data[56]	Employees		
		Group Member	Peak Employment*	%
Female	77	2,316	6,719	34%
Indigenous	61	256	5,278	5%
Temporary Foreign Worker (working in Canada with a temporary work visa)	66	124	5,830	2%
Registered Professional Foresters	68	114	6,074	2%
Registered Forest Technologists	68	134	6,074	2%
Seasonal Workers Residing Outside of BC During Off-season	64	2,276	5,823	35%

- **The employers reported that their workforce has grown at a rate of about 3.4% per year over the past five years and will grow at a rate of 3.1% over the next five years.**

  The employers that have been operating for five years or more were asked to report the number of FTE workers they employed in BC five years ago. On an aggregate basis, the 67 employers who responded reported that their number of FTEs had increased by 18.1% over the past five years, from 1,717 in 2015 to 2,027 in 2020.

Recent and Project Growth in FTE Employment

[56] Not all employers were able to provide data on the number of people they employ with those characteristics. For example, 61 employers reported data on the number of their peak employees who are Indigenous and 64 were able to provide data on the number of seasonal employees who reside outside of B.C. in the off-season. The Peak Employment includes only the employment associated with the employers able to provide data on that respective group.

Recent and Projected Growth	Data Reported by Employers	
	Projected 2020-2025	Recent 2015-2020
Employers Reporting Data	**65**	**67**
Employment in 2015	-	1,717
Employment in 2020	1,963	2,027
Project Employment in 2025	2,288	-
Five Year Growth in Employment	16.5%	18.1%
Annual Growth Rate	3.1%	3.4%

The employers were also asked to estimate the number of FTE workers their organization will employ in BC in 2025. The 65 employers who provided an estimate, projected that the number of FTEs will increase by 16.5% over the next five years, from 1,963 in 2020 to 2,288 in 2025.

The employers were also asked to identify up to three factors that impact most on the number of employees that they have in BC. The most commonly identified factors were growth in the overall market, market share, and the range of products or services they offer as indicated below.

Factors That Impact on the Number of Employees in BC

Factors	#	%
Change in overall industry revenues (e.g., expenditures by government and the private sector)	57	81%
Change in the market share held by your company	40	57%
Change in the range of products or services you provide	33	47%
Change in the scope of your operations (e.g., more locations)	25	36%
Change in productivity (e.g., reducing the number of workers needed)	13	19%
Other	10	14%
Total Employers	**70**	**100%***

**Responses are not mutually exclusive; therefore, percentages will not sum to 100%.*

- **The 77 employers reported aggregate revenues of about $352 million, an average of $4.6 million per firm.**

Revenue data reported in the follow table includes revenues generated from all operations, including those outside of BC. Of the 77 employers surveyed, 36% reported corporate revenues less than a million, including 27% with less than $500,000. 31% reported revenues in between $1 million to $3 million, while 19% reported $3 million to $10 million. The remaining 10 or 13% of large employers reported revenues over $10 million.

Ranges in Corporate Revenues

Corporate Revenues	Employers Surveyed	
	#	%
Less than $500,000	21	27%
$500,000 to $1 million	7	9%
$1 million to $3 million	24	31%
$3 million to $5 million	7	9%
$5 million to $10 million	8	10%
Over $10 million	10	13%
Total	**77**	**100%**
Total Revenues	**$352.0 million**	
Average Per Employer	**$4.6 million**	
Median Revenue	**$1.8 million**	

On average, 90% of the revenues are generated from silviculture related operations. Reported wage costs totalled 53% of revenues, expenditures on education and training totalled 2.8% and expenditures on other goods and services totalled 21% of revenues. Wage costs averaged about $65,091 per FTE.

Employer Revenues and Costs

Production Data Reported by Employers	Data Reported by Employers		
	Total	Average/Employer	As % of Revenues
Employers Reporting Data	77	--	--
Revenues ($ millions)	$352.0	$4.6	100%
Silviculture Revenues	$317.5	$4.1	90%
Wages	$185.7	$2.4	53%
Training and Education	$9.7	$0.1	3%
Other Goods and Services	$73.6	$1.0	21%

3.2 Employee Retention and Turnover

1. The employers reported an average turnover rate in permanent employment positions of about 11%.

Seventy-two employers provided data on both turnover rates and their number of permanent staff positions. As indicated in the table below, a majority (64%) of the employers reported a turnover rate of 5% or lower, 22% reported a 6% to 20% turnover rate, 10% reported between 21% to 40% turnover rate, while 4% indicated over 40% turnover rate.

Range in Reported Turnover Rates for Permanent Staff

Range in Turnover Rates	Employers Surveyed	
	#	%
0% to 5%	46	64%
6% to 10%	6	8%
11% to 15%	5	7%
16% to 20%	5	7%
21% to 30%	4	6%
31% to 40%	3	4%
Over 40%	3	4%
Total Respondents	**72**	**100%**
Simple Average	**7.1%**	
Weighted Average*	**11.0%**	

**The weighted average is based on the number of permanent employees of each organization*

The most common reasons contributing to employee turnover include being ready for a change and the opportunity for more and steadier work, career advancement or better pay.

Factors That Most Commonly Contribute to Turnover Among Permanent Staff?
(select all that apply)

Factors	Employers Surveyed	
	#	%
Ready for a change	43	70%
Opportunity for more and steadier work	20	33%
Opportunities for career advancement	19	31%
Opportunity for better pay	12	20%
Poor job performance	10	16%
Other	8	13%
Issues with a manager or co-worker	6	10%
Not sure	5	8%
Looking for better working conditions	1	2%
Total Respondents	**61**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

Other reasons included the staff members retired, left for health reasons, were looking for less physically demanding work, moved to be closer to friends or family and were looking for a lifestyle change. When asked if certain groups of individuals were more likely to leave their permanent positions than others, most employer said no. However, some employers identified:

- Older workers who were leaving the full-time workforce (12 employers);
- Younger less experienced workers (4 employers);

- People with families who moved to another community for family or personal reason (2 employers); and
- Women (2 employers).

When asked what strategy they and other employers can use to slow the turnover of permanent staff, employers indicated:

- Increasing compensation (e.g., paying competitive wages and/or providing financial benefits like RSP contributions, share options, and bonuses, 30%).
- Providing a flexible and enjoyable work environment with a good work life balance (28%).
- Providing career development opportunities like promotions, training and education, and company buy-in options (15%).
- Providing steady hours (10%).
- Offering a variety of work duties (4%).
- Offering standardized work protocols like performance reviews and safety plans (4%).

2. Over 60% of the seasonal workers were returnees from the previous years.

Of the 64 employers who reported employing field workers on a seasonal basis in 2020, 48 were able to provide information on the employment history of the seasonal field workers. These 48 employers reported having 4,147 seasonal field workers in 2020 on their busiest day of the year. Of these field workers, 61% were seasonal workers who had returned from 2019, 7% were not returning from 2019 but had previously worked for the organization, 11% were new to the organization but had previous experience, and 21% were new to both the industry and the organization.

Sources of Seasonal Field Workers in 2020

Recruitment Status	Employees	
	#	%
Returning from 2019	2,524	61%
Not returning from 2019 but had previously worked for the organization	293	7%
New to the organization but had previously worked in a similar organization/position	465	11%
New to the organization and industry	865	21%
Total	**4,147**	**100%**

The employers estimated that 69% of their seasonal or temporary field workers from 2020 have returned or will be returning for 2021.

According to the employers, the most common reasons field workers do not return are that they moved to another employer outside the sector, are not looking for employment (not working because of educational or other reasons) or moved to another employer in the sector.

Reasons Field Workers Do Not Return to Their Positions

Reasons (Select all that apply)	#	%
Moved to Another Employer Outside the Sector	36	69%
Are not working for other reasons	26	50%
Are not working because they are enrolled in an education program	22	42%
Moved to Another Employer in the Sector	20	38%
Were not asked to return	13	25%
Other	10	19%
Total Respondents	**52**	**100%***

**Responses are not mutually exclusive; will not sum to 100%*

Other comments included that the field worker aged out of the role, moved to an employer where the season was longer or the camp costs were lower, started their own company, or were receiving government benefits and have decided not to return.

3. **Overall, the most common reasons why seasonal workers leave the industry is the nature of the work, the seasonality of the work, and economic considerations.**

The following table presents the reasons why seasonal workers leave the industry. The top five reasons included the nature of the work (including 53% who indicated a major reason), the seasonal nature of the work (including 49% who indicated a major reason), economic considerations such as opportunities to earn greater income elsewhere (including 39% who indicated a major reason), working conditions (including 31% who indicated a major reason), and competition for workers from employers in other sectors (including 29% who indicated a major reason).

Major Reasons Why Seasonal Workers Leave the Sector

(On a scale of 1 to 3, where 1 is not a reason, 2 is somewhat of a reason, 3 is a major reason, what do you see as the major reasons why people leave the sector: N=53)

Reasons	Avg Rating	% Major Reason
The nature of the work (e.g., physicality)	2.5	53%
The seasonal nature of the work	2.4	49%
Economic considerations (opportunities to earn greater income elsewhere)	2.3	39%
The working conditions	2.1	31%
Competition for workers from employers in other sectors	2.1	29%
Health Issues	1.8	13%
Poor work performance (i.e., they are not invited back)	1.7	4%

Other comments included that the field worker aged out of the role, they wanted employment closer to their home or offered great work-life balance, or they were looking for longer-term employment. When asked if certain groups of seasonal workers were more likely to leave the sector than others, employers most commonly identified "older" workers (32% of employers), women (15%), and recent graduates or people who are recently married and may be looking for year-round work or a career related to their education (10%).

4. **The most common suggestions regarding strategies the industry can use to extend the length of time that workers stay in the industry focused primarily on improving work opportunities and providing greater financial incentives.**

Thirty-five of the employers provided suggestions regarding strategies the sector could use to increase the length of time that field workers stay in the industry. The most common suggestions include increasing work opportunities (54%), providing financial incentives (43%), improving working conditions (11%), and the need for the Government to promote and develop silviculture as a career opportunity for young people (9%).

Suggestions to Lengthen the Connection Between Field Workers and the Industry

Ways the sector could increase the length of time that field workers stay in the industry	#	%
Total Survey Respondents	**35**	**100%***
Provide more work opportunities (e.g., extend the season, provide off-season work, provide guaranteed work, increase job security).	19	54%
Provide financial incentives (e.g., increase wages, provide benefits, pension).	15	43%
Improve working conditions (e.g., provide more training/education opportunities, provide comfortable camp life, focus on a safe and inclusive work environment).	4	11%
Government should promote and develop silviculture as a good career opportunity for young people (e.g., Targeted advertisement, PR campaign, create partnerships between sectors to create year-round jobs).	3	9%
Hire local (e.g., Hiring local allows people to see their families, create partnerships with others in order to hire local and provide more work).	2	6%
Focus on training and developing rookies (e.g., well trained and developed rookies stay longer).	1	3%

**Responses are not mutually exclusive; will not sum to %100.*

5. **Employers reported using a variety of strategies to differentiate themselves in terms of retaining seasonal or temporary employees.**

Reflecting, in part, the impact of COVID-19, the most commonly identified strategy was to focus on safety in the worksite. Other common strategies are to offer a positive work environment, emphasize fairness in treatment of employees, and offer an inclusive and welcoming environment for workers.

Strategies Used By Employers to Retain Seasonal Employees

Factors	Employers Surveyed	
	#	%
Focus on safety in the work site	35	69%
Offer a positive work environment	32	63%
Emphasize fairness in treatment of employees	28	55%
Offer an inclusive and welcoming environment for workers	25	49%
Create additional opportunities to earn income (e.g., extending the season)	20	39%
Provide better compensation or benefits	18	35%
Provide better equipment and work conditions	16	31%
Create opportunities for advancement/career development	13	25%
Provide opportunities for training	12	24%
Maintain communication during the off-season	11	22%
Provide financial incentives for them to return	11	22%
Offer a recognition and rewards program	2	4%
Total Respondents	**51**	**100%***

**Responses are not mutually exclusive, will not sum to 100%.*

3.3 Hiring

1. **The employers estimated that they would hire 2,018 employees (an average of 32.5 employees per organization) over the next 12 months to fill temporary, seasonal or permanent positions.**

   Of the 77 employers that provided detailed employment data, 62 provided estimates of the number of people that their organization will hire over the next 12 months to fill temporary, seasonal or permanent positions. The figures are summarized below.

Range in 2021 Hiring Expectation of Employers

Anticipated New Hires	Employers Surveyed	
	#	%
Total Anticipated New Hires	**2,018**	
0	13	21%
1-5	18	29%
6 to 20	13	21%
21 to 100	12	19%
Over 100	6	10%
Total Identifying Hiring and Rating Expected Difficulties	**62**	**100%**
Average	**32.5**	

Reflecting the characteristics of the business, the employers most commonly identified tree planters, other field staff and nursery workers as the primary positions they will be filling.

2. Most employers do not anticipate experiencing significant difficulties in filling these positions.

On a scale of 1 to 5, where 1 is not at all difficult, 3 is somewhat difficult, and 5 is very difficult, employers provided an average rating of 2.7 in terms of how difficult they anticipate it will be to recruit qualified candidates for the positions they need to fill.

Anticipated Difficulty in Filling Positions

(On a scale of 1 to 5, where 1 is not at all difficult, 3 is somewhat difficult, and 5 is very difficult, how difficult do you anticipate it will be to recruit qualified candidates for these positions?)

Rating	Employers Surveyed	
	#	%
1 Not at all difficult	13	22%
2	13	22%
3 Somewhat difficult	16	27%
4	14	23%
5 Very difficult	4	7%
Total Respondents	**60**	**100%**
Average Rating	**2.7**	

In general, there was not a strong correlation between the expected number of people to be hired and the expected difficulty in making those hires. However, employers expecting to hire over 100 people did anticipate greater difficulties, providing an average rating of 4.0 on the scale of 1 to 5, where 1 is not at all difficult and 5 is very difficult.

3. Employers who anticipate to have difficulties hiring, identified a range of positions which will be difficult to fill and a variety of reasons why those positions will be difficult to fill.

Employers who rated recruiting qualified candidates to fill their upcoming positions as at least somewhat difficult, on the scale of 1 to 5, were asked to identify up to three specific positions that they feel will be difficult to fill. In total, 81 positions were identified by 32 employers. The positions that were most often identified as difficult to fill related to field staff, management, technical and other positions as indicated in the table below.

Positions Identified As Difficult to Fill by Employers

Type of Positions	#	Specific Position
Field staff	31	Planters (8); Brushers and Spacers (5); Cooks (4); Checker (3); Cone Collector (1); Driver (1); Entry Level Staff (4); Field Staff (3); Forest Workers (1); and OFA 3 (1);
Managers, supervisors and crew chiefs	26	Crew Boss (10); Foreman (2); Manager/supervisor (11); Project Manager (2); and Seasonal Lead Hands (1)
Technical positions	8	Equipment Operator; Forest Technician; Forestry Grads (FIT); Forestry Professionals; Grads from Technical Colleges; Mid-Level Field Engineer; Senior Field Engineer; and Senior Forest Field Technicians (1 each).
Wildfire fighters	6	---
Nursery workers	5	---
Other	5	---
Total	**81**	**---**

When asked about the reasons these positions are difficult to fill, the employers most commonly identified few applicants with the desired experience or skills sets and strong competition for these workers from other employers in the sector.

Factors Contributing To Difficulties In Attracting Qualified Candidates for Each Type of Position

Factors Contributing to Difficulties	Field	Mgmt	Nursery	Other	Technical	Wildfire	Total	Percent
Number of Positions Identified	**31**	**26**	**5**	**5**	**8**	**6**	**81**	**100%**
Few applicants with the experience required	17	20	2	2	5	5	51	63%
Few applicants with the specific skills set we look for	17	17	2	2	6	4	48	59%
Strong competition for these workers from other employers in our sector	18	13	1	1	7	4	44	54%
Few applicants with the personal attributes we are looking for	12	16	0	4	2	1	35	43%
Limited interest in the sector or occupation amongst youth	15	10	2	3	4	1	35	43%
Strong competition for these workers from employers in other sectors	13	13	2	1	2	0	31	38%
Few applicants with the education, training, or certifications required	8	12	1	0	3	5	29	36%
Many of the skilled workers in this position are nearing retirement	4	8	0	0	2	1	15	19%

The following table summarizes the number and percent of employers who identified these reasons for one or more of their positions and the top three specific positions associated with each reason. Most reasons were associated with a range of positions. As might be expected, the reason "Many of the skilled workers in this position are nearing retirement" tended to be most closely associated with management positions and forestry consultants/forestry technicians.

Factors Contributing To Difficulties In Attracting Qualified Candidates

Factors	Employers		Top 3 Positions Mentioned
	#	%	
Few applicants with the experience required	27	84%	1. Supervisors or project managers 2. Tree planters 3. Crew leaders
Few applicants with the specific skills sets required	25	78%	1. Supervisors or project managers 2. Crew leaders 3. Tree planters
Strong competition for these workers from other employers in our sector	24	75%	1. Supervisors or project managers 2. Tree planters 3. Crew leaders
Strong competition for these workers from employers in other sectors	20	63%	1. Supervisors or project managers 2. Tree planters 3. Crew leaders
Few applicants with the personal attributes required	19	59%	1. Supervisors or project managers 2. Tree planters 3. Crew leaders
Few applicants with the education, training, or certifications required	19	59%	1. Supervisors or project managers 2. Crew leaders 3. Wildfire Fighters
Limited interest in the sector or occupation amongst youth	18	56%	1. Supervisors or project managers 2. Silviculture nursery worker 3. Tree planters
Many of the skilled workers in this position are nearing retirement	13	41%	1. Supervisors or project managers 2. Crew leaders 3. Forestry Consultants/Technicians
Total*	**32**	**100%**	---

**Responses are not mutually exclusive, will not sum to 100%*

4. When asked about skills in short supply, employers most commonly identified work ethic/attitude and commitment towards work.

Employers who rated recruiting qualified candidates to fill their upcoming positions as at least somewhat difficult, on the scale of 1 to 5, were asked to identify the specific skills set are most in short supply. In addition to work ethic, some of the commonly identified reasons included leadership and interpersonal skills, critical thinking skills, human resource management skills (e.g., willingness and ability to manage people), management skills (ability to manage operations), and technical skills. Employers in forestry consulting were more likely to note the lack of technical skills, critical thinking skills, and ability to work independently.

Specific Skills That are Most in Short Supply

Skill Set	Employers Surveyed	
	#	%
Work ethic/attitude or commitment towards work	20	63%
Leadership and interpersonal skills	14	44%
Critical thinking skills	13	41%
HR management skills (willingness/ability to manage people)	13	41%
Management skills (ability to manage operations)	13	41%
Technical skills	13	41%
Physical skills and endurance	12	38%
Ability to working independently	8	25%
Communication skills	8	25%
Familiarity with working outdoors	7	22%
Professionalism	5	16%
Skills in working in a team environment	3	9%
Other	1	3.1%
Total Respondents	**32**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

5. **Employers use a variety of strategies to create awareness of employment opportunities, of which recruiting through existing employees is most common.**

The following table summarizes the commonly identified strategies or actions taken by employers to create awareness of their employment opportunities. Leading strategies or actions included recruitment though existing employees (75%), friends or acquaintances (55%), utilizing social media (55%), and posting job ads on company websites (54%).

Strategies Used By Employers to Create Awareness of Employment Opportunities

Strategies	Employers Surveyed	
	#	%
Recruit through existing employees	49	75%
Recruit through friends or acquaintances	36	55%
Use social media (e.g., Facebook, Instagram)	36	55%
Post positions on the company website	35	54%
Rely on new and returning employees to contact you	34	52%
Paid advertising or job postings (e.g. Indeed, Zip Recruiter)	18	28%
Participate in job fairs	5	8%
Engage recruitment companies	1	2%
Other	3	5%
Total Respondents*	**65**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

6. **In response to continuing difficulties in filling positions, the employers are most likely to increase compensation, increase their investment in training, more aggressively promote job openings through traditional approaches, and test out new strategies to attract workers.**

   Employers who rated recruiting qualified candidates as at least somewhat difficult were asked how they would respond to continuing difficulties. The most common actions identified are listed in the table below. Less commonly identified strategies were to slow their rate of business growth, increase the hours worked by staff, hire temporary foreign workers or reduce the job requirements.

Strategies Employers Are Most Likely to Use If Facing Continuing Difficulties in Attracting Qualified Candidates

Likely Responses	Employers Surveyed	
	#	%
Increase wages or benefits to make our positions more attractive to candidates	21	62%
Increase our investment in training	18	53%
Employ new strategies to try to attract workers	15	44%
More aggressively promote our job openings through our traditional approaches	14	41%
Increase our investment in equipment or technology to reduce labour requirements	7	21%
Slow our rate of business growth	7	21%
Increase the amount of hours worked by our staff	7	21%
Hire temporary foreign workers with the required skills	3	9%
Reduce our job requirements (in terms of experience, education, or certifications) where possible	3	9%
Outsource certain functions or work	3	9%
Total Respondents*	**34**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

3.4 Education and Training

1. **Almost all employers with staff provide at least some form of training for their staff and many provide additional training to prepare workers moving into supervisor, crew chief and management roles in the organization.**

   Those most common types of training are health and safety and onboarding/orientation for new employees. Somewhat less common are multi-day technical training taken by employees from outside sources, technical workshops or seminars on topics relevant to particular positions, and formal mentoring programs. The other types of training ranged from informal mentoring to periodic training updates or upgrade programs.

Employers by Education and Training Provided to Employees

Education and Training	Employers Surveyed	
	#	%
Health and safety training	62	95%
An onboarding/orientation program for new employees	58	89%
Funding for multi-day technical training taken by employees from outside sources	39	60%
Technical workshops or seminars on topics relevant to particular positions	38	58%
A formal mentoring program	21	32%
Other types of training	6	9%
Total Respondents*	**65**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

Forty-three employers also indicated that they provide some form of training to prepare workers moving into supervisor, crew chief and management roles in the organization. The types of training identified include:

- Management mentoring, one on one training and career development, management or onboarding (24 employers)
- Health and safety training (e.g., First aid training, accident investigation, BCFSC, Joint Occupational Health and Safety Committee training) (15)
- Management training (e.g., leadership skills training, training for crew leaders, pre-season training for management) (15)
- Field experience (e.g., smaller missions to accomplish split from the main crew, Job shadowing, coaching) (9)
- External courses in management/supervisor training (9)
- Driving training on how to drive crew cabs and quads (5)
- Online job specific training/webinars (5)
- Technical training (2)

2. **Forty-eight employers identified particular positions in their organization where education, training, designations and certifications were very important in their decision to hire specific workers.**

When asked if there were particular positions in their organizations where education, training, designations, and certifications are very important in their hiring decisions, 48 of 65 employers who responses indicated yes (74%) and 17 indicated no (26%). The education, training, designations, and certifications identified by these 48 employers included:

- First Aid (20 employers)
- Dangerous Tree Assessor (10)
- RPF and RFT designations (10)
- Horticulture degree (7)
- Forestry degree (6)
- Driver training/experience (6)
- Management training (6)
- Silviculture surveying (6)
- Certified Faller Fallers (5)
- Fire training (e.g., FireSmart Fire Suppression, Basic Fire Suppression, S100) (5)
- Health & safety (4)
- ATV operation (3)
- Project Management (3)
- Power saw training (2)
- FoodSafe (2)
- Grower (2)
- Agriculture degree (2)
- Environmental-relate degree (2)
- Cook
- Resource road training
- Computer skills
- Waste assessment
- Harassment & bullying
- Herb ticket holder
- P. Eng
- Accounting
- Log Scaler
- Business degree
- HR management
- Plant pathology in lab
- Natural Resources degree
- Pesticide Applicator Certificate

3. **Education and training programs are perceived by employers as somewhat effective in preparing people for these positions.**

   The employers were asked to rate, on a scale of 1 to 5, where 1 is not at all effective, 3 is somewhat effective, and 5 is very effective, how effective the existing education and training programs are in preparing employees for the positions within their organization that require education, training, designations, and/or certifications. As indicated below, the employers provided an average rating of 3.4, of which 46% indicated that it is effective.

Rated Effectiveness of Existing Education and Training Programs

(Question: On a scale of 1 to 5, where 1 is not at all effective, 3 is somewhat effective, and 5 is very effective, how effective are the existing education and training programs in preparing these people for the positions with your organization?)

Rating	Employers Surveyed	
	#	%
1 Not at all effective	4	6%
2	1	2%
3 Somewhat effective	30	47%
4	21	33%
5 Very Effective	8	13%
Total Respondents	**64**	**100%**
Average Rating	**3.4**	

The 35 employers who responded with a score or 3 or less identified a lack of experiential, operational, or practical learning, insufficient local training opportunities, and a lack of human resource management or leadership skill development as the main areas in which the available education and training programs are not reaching the needs of their organization.

Employers in forestry consulting were again more likely to suggest that the educational programs are not as effective in preparing new consultants for the job. There are numerous certification and professional designations required for forestry consultants which often fall on employers to do, increasing their costs and inability to recruit and retain workers.

3.5 Impacts of COVID-19

1. **In 2020, COVID-19 had a major impact in terms of requiring employers to implement measures related to health and safety, increasing the costs of field operations, and increasing the stress felt by employees.**

   As indicated in the table below, it also had some impact in terms reducing productivity and employment levels.

Impact of COVID-19 on the Employers Operations in 2020

Question: Would you say that COVID-19 increased, decreased or had no impact on your operations in the following areas?

Impacts	Decreased		Had No Impact	Increased		Total
	Significantly	Somewhat		Somewhat	Significantly	
The overall level of work your organization performed in 2020 (n=68)	10%	19%	41%	15%	15%	100%
Measures you implemented related to health and safety (n=70)	3%	3%	3%	14%	77%	100%

Impacts	Decreased		Had No Impact	Increased		Total
	Significantly	Somewhat		Somewhat	Significantly	
Costs associated with your field operations (n=67)	1%	3%	6%	36%	54%	100%
Labour productivity (n=70)	9%	44%	29%	16%	3%	100%
Employment levels during your peak season (n=69)	13%	19%	46%	17%	4%	100%
Employment levels during the off-peak time (n=69)	6%	22%	67%	4%	1%	100%
The stress felt by employees (n=68)	1%	0%	13%	31%	54%	100%

According to most employers, it has surprisingly little overall impact on the overall level of work performed by the organization. However, some were significantly negatively impacted. For example, several noted that demand slowed significantly, and one had to close operations for a few months, another noted that the BC Wildfire Service was hesitant to use their crews because of the added logistical issues created by COVID, and some noted that COVID protocols slowed operations and were short staffed because some employees simply did not show up for work because of health concerns or travel restrictions.

A variety of other impacts were also identified. For example, the time required to setup camps and move people increased. Many organizations experienced a delay at the beginning of the season. Workloads increased for crew leaders and managers who needed to plan, re-examine operations, organize travel, define and implement new measures, policies, training, protocols and practices, engage laundry services, and secure new equipment (e.g., from laundry trailers to hand sanitizers). In some cases, the need to have more separated accommodations created housing issues. The isolation combined with uncertainty, increased stress and pandemic fatigue contributed to increased mental health concerns. Some organizations experienced supply chain issues and contracting delays. Quarantine issues slowed productivity. On the positive side, the incidence of influenza and colds decreased.

2. Approximately half of the employers created new positions in response to COVID-19.

Thirty-eight of the 70 employers (56%) that responded to the COVID-19 questions indicated that they had created one or more new positions in response to the pandemic. These positions included:

- COVID-19 coordinator (21 employers)
- Additional cooks/kitchen support (14)
- Town Runners (5)
- Camp sanitizer and cleaners (10)
- COVID-19 Monitor (2)
- Additional camp hands (2)
- COVID travel Coordinator
- General staff

- Health and safety coordinator
- Laundry personnel
- A health planner

Of those employers who created a new position(s) in response to COVID-19, 37% indicated that some of the positions would continue once the pandemic is over, while 27% said that most positions would continue, 20% were not sure, and 17% said no positions would continue. In addition, four employers indicated that they were planning to create additional positions in 2021 including COVID-19 coordinators, additional town runners and a mental health coordinator.

3.6 Key Industry Issues

1. **While employers identified a wide variety of issues facing the industry, no one issue was identified as a high priority by a majority of the employers.**

   We developed a list of potential issues that may need to be addressed to strengthen the sector. The employers were then asked to rate, on a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority and 5 is a major priority, how much of a priority they thought the sector should place on those issues. As indicated below, the highest rated priorities were to improve the industry profitability, keep people in the sector for longer, improving awareness of the sector as a potential source of employment for youth, and strengthening education and training.

Employer Perceptions Of The Level Of Priority That Should Be Placed On Various Industry Issues

(On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority and 5 is a major priority, how much of a priority do you think should the sector place on the following issues?)

(N=64)

Potential Issues	Avg Rating	% Major Priority
Improving the profitability of the companies in the industry	3.94	41%
Finding ways to keep people in the sector for longer (e.g., increasing employment opportunities/providing opportunities for career advancement/better retention strategies)	3.91	34%
Improving awareness and perceptions of the sector as a potential source of employment for youth	3.78	33%
Strengthening training and support provided to new employees and those already in the sector	3.67	23%
Strengthening education and training programs focused on forestry	3.63	22%
Improving health and safety measures	3.61	20%
Better managing workloads for employees in the sector	3.52	30%
Increasing access to resources to support mental health	3.48	19%
Better preparing new and returning seasonal workers for the start of the season (e.g. equipment, fitness level, safety awareness, skills training)	3.44	16%

Potential Issues	Avg Rating	% Major Priority
Improving living conditions in camps (e.g., facilities, food, etc.)	3.39	20%
Better addressing harassment and bullying in the workplace	3.39	26%
Improving adherence to employment standards/addressing gaps in existing policies and structures	3.22	9%
Addressing business succession issues	3.21	17%
Increasing engagement of First Nations in the sector	3.18	15%
Accelerating the adoption of new technology in the workplace	3.17	11%
Increasing the diversity of the work force (e.g., increasing participation of women, Indigenous, ethnic minorities, recent immigrants, etc.)	3.16	13%

2. **Employers provided a wide range of recommendations regarding actions that could be taken to improve labour market conditions in the sector.**

   These recommendations are summarized in the table below.

Theme	Recommendations
Contracting	• Facilitate increases in payment rates and ensure those rates keep pace with inflation (some noted that the concentration of market power on the buyer side is driving down prices, reducing quality, and lowering labour standards). For example, some contractors noted that private licensees are forcing below market value rates. Suggested options included establishing minimum prices, working to improve bid transparency, and better tracking trends regarding the rates paid. • Change the contracting procedures of the BC Wildfire Service to better compensate companies who have to train crews to BCWFS contract standards with no guarantees of work. Under the current system, there is concern that contractors are moving into other lines of work and capacity will not be available when needed. • Create greater stability through the use of longer, multi-year contracts and better workload planning (not issuing contracts in late fall for completion by March). • Encourage buyers to place a priority or a greater priority on local bidders. • Incorporate other criteria into the bid selection process such as the carbon footprint and level of local employment. • Use contracting as a mechanism to smooth market demand to avoid the boom-and-bust cycles which negatively impact economic stability and staff retention.
Diversity	• Increase the participation of Indigenous contractors and staff in the industry. • Promote greater diversity among both contractors and staff. Improving diversity could have a major impact on increasing access to workers and improving the stability of the labour market. • Promote greater gender balance in management. • Promote the industry to a broader community (e.g., reach out to immigrant communities and other organizations that represent diverse people).
Length of Season	• Find ways to extend the worker season by offering greater opportunities for year-round or off- season employment (e.g., offer fuel management and wildfire risk reduction contracts). • Government can better enable companies to provide more guaranteed/year-round work for employees through multi-year contracts, improved contract co-ordination

Theme	Recommendations
	and allowing for the rolling of government funding from one government fiscal year to the next.
Workplace Issues	• Continue to strengthen safety practices (e.g., ensure that danger tree assessments and hazard tree management are always conducted, all operations meet prevailing labour standards, workplace and camp inspections are carried out by WorkSafe BC, workers are kept safe during the pandemic, and hygiene and sanitary conditions improve). • Continue efforts to address harassment issues and other social issues/improve harassment training. • Improve the quality of camps (improve living conditions will, in turn, have benefits in terms of safety, harassment, and sickness).
Communications	• Improve communications infrastructure to ensure that all camps have effective internet connectivity. • Improve coast to coast communication between players in the industry.
Management	• Create more roles in camp to spread out the workload for management and empower more people.
Public Awareness	• Increase public awareness of the economic and environmental benefits of a strong working forest. • Increase the appeal of the industry to the younger generation/better demonstrate how it aligns with their lifestyle expectations and promote the desirability of physical labour. • Increase awareness of the industry and the many employment and business opportunities that are available. • Implement programs to attract local workers, including Indigenous workers, located in nearby communities.
Forest Management	• Lobby for more investment in long term intensive silviculture programs /promote increased federal government investment into reforestation.
Foreign workers	• Facilitate easier access to foreign labour (e.g., greater use of the Temporary Foreign Worker Program and the Provincial Nominee Program).
Wages	• Ensure that wage rates keep pace with inflation. • Establish minimum wages for the industry. • Discourage low-balling of contract bids which results in low wages for workers.
Training and Education	• Ensure education and training programs meet with the requirements/expectations of employers and meet certification requirements. • Continue to improve pre-season fitness training (look into cross training and diet). • Professionalize the industry. • Strengthen linkages between industry and educators/trainers (encourage more students in forestry and other related programs to work at meaningful jobs in the industry during their school years). • Promote forestry-related education programs to youth. • Increase access to training opportunities associated with certifications (e.g., for fallers)/the lack of accessibility results in companies missing out on contracts and work.

3.7 Responses by Sector

This section provides a summary of responses by sector.

Planting, Brushing and Spacing

As indicated in the quantitative summary table below, the employers who indicated that they are primarily involved in planting, brushing and spacing reported employing an average of approximately 41 FTEs, of which 32 were based in BC. Employment peaked at about 130 people.

Quantitative Data Summary By Sector

	Consulting	Wildfire Fighting & Other	Forestry Nurseries	Planting, Brushing and Spacing	Total
Employers	**19**	**8**	**12**	**38**	**77**
Average					
FTEs	19.9	6.6	61.3	40.6	35.0
BC FTEs	19.9	6.4	54.3	32.1	29.7
Peak Employment	24.2	27.8	90.6	129.8	87.3
Peak Field Staff	12.7	15.2	15.2	114.3	64.0
Year-round Staff	7.9	8.6	19.8	7.1	9.2
Composition of the Work Force					
Female	25%	15%	41%	35%	34%
Indigenous	7%	18%	6%	4%	5%
TFW	1%	0%	7%	1%	2%
RPF*	18%	1%	1%	1%	2%
RFT**	21%	1%	1%	1%	2%
Growth					
2015-20	2.9	-4.3	4.4	3.2	3.4
2020-25 (projected)	8.0	9.5	2.7	2.2	3.1

**Registered Professional Forester*
***Registered Forest Technologist*

These employers reported planting 253 million trees in 2020 (which would account for 83% of the estimated 305 million trees planted in BC in 2020). The employers also reported brushing 5,515 hectares and spacing or thinning 326 hectares in 2020. Production per day averaged 1,664 trees plants, 0.58 hectares brushed, and 0.25 hectares spaced.

Tree Planting, Brushing and Spacing Production Data in 2020

Production Data Reported by Employers	Data Reported by Employers		
	Tree Planting	Brushing	Spacing
Employers Reporting Data	33	21	7
Number of Trees Planted	253 million	--	--
Number of Hectares Brushed or Spaced	---	5,515	326
Average Trees or Hectares Per Day Per Worker	1,664	0.58	0.23
Person Days Worked By Staff	152,298	9,439	1,415
Field Staff	3,391	--	--
Average Days Worked Per Worker	45.9	--	--

As indicated in the summary of qualitative indicators beginning on the following page, most (87%) employers who indicated they were primarily involved in planting, brushing and spacing suggested that the main contributor to turnover amongst their permanent staff was that they were ready for a change, and the majority (65%) suggested that the primary reason that field workers do not return is that they have moved to another employer outside the sector. Similarly, the most prominent reasons that seasonal workers leave the sector were identified as the general nature of the work and the seasonal nature of the positions.

Employers were also asked about the hiring of employees. According to the employers surveyed, candidates with the required leadership and interpersonal skills, managements skills, and commitment/work ethic are in short supply. Most (81%) employers indicated that they primarily promote employment opportunities through existing employees, and the majority (61%) rely on existing or new employees to contact them. In response to hiring difficulties, most (80%) employers indicated that they increased the wages or benefits of certain positions to make them more attractive.

When asked about the impacts of COVID-19, employers indicated that the most prominent impacts were increases in the implementation of health and safety measures, a rise in the costs associated with field work, and an increase in the level of stress felt by employees. Correspondingly, 66% of employers indicated that they had created a new position in response to COVID-19.

Lastly, employers primarily involved in planting, brushing and spacing specified that the improvement of company profitability, the better addressment of bullying and harassment in the workplace, and the finding of ways to increase the length of time workers remain in the sector are the key issues facing the industry, and the majority (70%) indicated that overall industry revenues would be the primary driver of growth going forward.

Qualitative Data Summary By Sector[57]

(Top 3 factors presented per indicator)

Qualitative Indicators	Consulting	Wildfire Fighting & Other	Forestry Nurseries	Planting, Brushing and Spacing
Drivers of growth	▪ Overall industry revenues (88%) ▪ Range of products or services offered (56%) ▪ Market share (44%)	▪ Overall industry revenues (50%) ▪ Range of products or services offered (50%) ▪ Scope of the organization (25%)	▪ Overall industry revenues (85%) ▪ Market share (77%) ▪ Range of products or services offered (46%)	▪ Overall industry revenues (70%) ▪ Market share (58%) ▪ Range of products or services offered (35%)
Contributors to turnover of permanent staff	▪ Opportunity for better pay (60%) ▪ Ready for a change (60%) ▪ Opportunities for career advancement (50%)	▪ Ready for a change (60%) ▪ Opportunities for career advancement (60%) ▪ Opportunity for more and steadier work (60%)	▪ Ready for a change (89%) ▪ Opportunities for career advancement (44%) ▪ Opportunity for more and steadier work (33%)	▪ Ready for a change (87%) ▪ Opportunity for more and steadier work (43%) ▪ Opportunities for career advancement (23%)
Reasons why field workers do not return	▪ Moved to another employer outside the sector (77%) ▪ Enrolled in an education program (38%) ▪ Other reasons (38%)	▪ Moved to another employer outside the sector (71%) ▪ Not asked to return (71%) ▪ Moved to another employer in your sector (57%)	▪ Moved to another employer outside the sector (80%) ▪ Other reasons (70%) ▪ Enrolled in an education program (60%)	▪ Moved to another employer outside the sector (65%) ▪ Other reasons (55%) ▪ Enrolled in an education program (50%)
Reasons why seasonal workers leave the sector (scale 1 to 3, where 1 is not a reason, 3 is major reason)	▪ Economic considerations (2.56) ▪ Nature of the work (2.20) ▪ Competition for workers from employers in other sectors (2.11)	▪ Seasonal nature (2.71) ▪ Nature of the work (2.67) ▪ Economic considerations (2.25)	▪ Nature of the work (2.33) ▪ Seasonal nature (1.67) ▪ Economic considerations (1.67)	▪ Nature of the work (2.56) ▪ Seasonal nature (2.47) ▪ Economic considerations (2.33)
Skills in short supply	▪ Technical skills ▪ Critical thinking skills ▪ Management skills	▪ Work ethic/attitude or commitment towards work ▪ Physical skills and endurance ▪ Technical skills	▪ Work ethic/attitude or commitment towards work ▪ Physical skills and endurance ▪ Technical skills	▪ Leadership and interpersonal skills ▪ Management skills ▪ Work ethic/attitude or commitment towards work
Strategies in promoting employment opportunities	▪ Paid advertising or job postings (58%) ▪ Recruit through existing employees (50%) ▪ Recruit through friends or acquaintances (50%)	▪ Post positions on the company website (83%) ▪ Social Media (67%) ▪ Recruit through existing employees (50%)	▪ Recruit through existing employees (92%) ▪ Rely on new and returning employees to contact you (75%) ▪ Post positions on the company website (67%)	▪ Recruit through existing employees (81%) ▪ Rely on new and returning employees to contact you (61%) ▪ Recruit through friends or acquaintances (61%)

[57] The number of respondents to each qualitative question can vary. Percentages and ratings were computed based on those who provided an answer to the question.

Qualitative Indicators	Consulting	Wildfire Fighting & Other	Forestry Nurseries	Planting, Brushing and Spacing
Actions in response to hiring difficulties	▪ More aggressively promote job openings through traditional approaches (57%) ▪ Employ new strategies to try to attract workers (43%) ▪ Increase wages or benefits to make positions more attractive (43%)	▪ Increase investment in training (100%) ▪ More aggressively promote job openings through traditional approaches (50%) ▪ Increase wages or benefits to make positions more attractive (50%)	▪ Increase wages or benefits to make positions more attractive (71%) ▪ More aggressively promote job openings through traditional approaches (57%) ▪ Increase investment in training (43%)	▪ Increase wages or benefits to make positions more attractive (80%) ▪ Increase investment in training (73%) ▪ Employ new strategies to try to attract workers (60%)
Impact of COVID-19 *	▪ Measures you implemented related to health and safety (+) ▪ Costs associated with field operations (+) ▪ The stress felt by employees (+)	▪ Measures you implemented related to health and safety (+) ▪ Costs associated with field operations (+) ▪ The stress felt by employees (+)	▪ Measures you implemented related to health and safety (+) ▪ The stress felt by employees (+) ▪ Costs associated with field operations (+)	▪ Measures you implemented related to health and safety (+) ▪ Costs associated with field operations (+) ▪ The stress felt by employees (+)
Created new positions in response to COVID	20%	29%	15%	66%
Key issues facing the industry	▪ Improving the profitability of the companies in the industry (4.23) ▪ Improving awareness and perceptions of the sector as a potential source of employment for youth (4.15) ▪ Strengthening education and training programs focused on forestry (4.15)	▪ Improving the profitability of the companies in the industry (4.33) ▪ Finding ways to keep people in the sector for longer (4) ▪ Strengthening education and training programs focused on forestry (3.8)	▪ Improving awareness and perceptions of the sector as a potential source of employment for youth (4.33) ▪ Finding ways to keep people in the sector for longer (4) ▪ Strengthening education and training programs focused on forestry (4)	▪ Improving the profitability of the companies in the industry (4.03) ▪ Better addressing harassment and bullying in the workplace (3.94) ▪ Finding ways to keep people in the sector for longer (3.79)

* + indicates that employers reported an increase in the qualitative indicator as a result of COVID-19

Wildfire Fighting & Other

Ten employers reported employing 145 wildfire fighters in 2020 (39 on an FTE basis, which accounted for 15% of their total FTEs in 2020). On average, these forest fighters spent 18 days waiting for stand-by call (i.e. pre-stand by status), 37 days on standby and 23 days deployed doing wildfire fighting activities. Of the 145 reported number of wildfire fighters, 128 (88%) had at least one day deployed doing wildfire fighting activities.

Wildfire Fighting Activities in 2018 and 2020

Production Data Reported by Employers	Data Reported by Employers	
	2020	**2018**
Employers Reporting Data	10	10
Number of Wildfire Fighters Employed	145	369
Number Deployed For At Least 1 Day	128	346
FTE Wildfire Fighters	39	144
Average Number of Days		
Waiting for stand-by call	18	5
On standby	37	9
Deployed doing wildfire fighting	23	26

All ten employers were also active in wildfire fighting in 2018. These employers reported employing 369 wildfire fighters in 2018 (144 on an FTE basis, which accounted for 44% of their total FTEs in 2018). On average, these forest fighters spent 5 days waiting for stand-by call (i.e., pre-stand by status), 9 days on standby and 26 days deployed doing wildfire fighting activities. Of the 369 reported number of wildfire fighters, 346 (94%) had at least one day deployed doing wildfire fighting activities.

As was summarized in the table of qualitative indicators (pages 64-65), the majority (60%) of employers involved in wildfire fighting suggested that the primary contributors to turnover amongst their permanent staff were that employees were simply ready for a change, that they had pursued opportunities for career advancement, or that they sought more or steadier work elsewhere. In terms of the primary factors driving turnover amongst field workers, 71% of employers indicated both employee movement to another employer outside the sector and that the employee was not asked to return. Relatedly, the most prominent reasons why seasonal employees leave the sector were indicated as the seasonal nature of the positions and the general nature of the work.

When asked about hiring workers, employers suggested that it is hard to find candidates with the required work ethic/commitment, the physical skills or endurance, or the technical skills. To promote employment opportunities, most (83%) employers reported posting positions on their company website and 67% indicated using used social media. In terms of actions taken in response to hiring difficulties, all employers surveyed reported increasing their investment in training, while half indicated more aggressively promoting job openings through traditional approaches, and half reported increasing the wages or benefits of specific positions to make them more attractive.

Employers interviewed added that the contracting structure with BCWS makes things more challenging. It is difficult and costly to recruit and train Type 2 and Type 3 contract crews who are essential for busy seasons but otherwise have no guaranteed work. Other contract specific requirements (training, experience, certification, contract duration) are also contributing to challenges in recruiting contracted crews.

The main impacts of COVID-19 within the Wildfire Fighting sector were reported as an escalation in the health and safety measures implemented by employers and increases in the stress felt by employees and the costs associated with field operations, with some employers (29%) creating a new position in response to COVID.

Looking at the industry as a whole, employers indicated improving the profitability of companies, finding ways to keep employees in the sector longer, and strengthening the related education and training programs as key issues. Additionally, half of respondents identified overall industry revenues, and the range of products and services offered as the primary drivers of sectoral growth.

Consulting

As was indicated in the table summarizing quantitative data by sector (page 62), the employers who indicated that they are primarily involved in consulting reported employing an average of approximately 20 FTEs, all of which are based in BC. Employment peaked at about 24 people. Their employment has grown at a rate of 2.9% over the past five years but is expected to grow at a rate of 8% over the next five years.

As was summarized in the table of qualitative indicators (pages 64-65), the majority (60%) of consulting employers find that the major contributors to turnover of their permanent staff are opportunities for better pay and that they are ready for a change. The primary reason why field workers do not return was reported as having moved to another employer outside the sector (77%). In terms of reasons why seasonal workers leave the consulting sector, respondents reported economic considerations, the general nature of the work, and competition for workers from employers in other sectors as the foremost factors. When asked about hiring new employees, respondents reported that candidates with the necessary technical, critical thinking, or management skills are in short supply, and indicated having used paid advertising or job postings (58%), recruitment through existing employees (50%), or recruitment through friends or acquaintances (50%) as strategies to promote employment opportunities. Relatedly, the majority (57%) of respondents mentioned more aggressively promoting job opportunities through traditional approaches as a response to hiring difficulties.

Employers reported the top impacts of COVID-19 as an increase in the implementation of health and safety measures, heightened costs associated with field operations, and increased stress levels felt by employees, with 20% indicating that they had created a new position in response to the pandemic.

In terms of sector growth, 88% of respondents indicated overall industry revenues, and 56% indicated the range of products and services provided as the main drivers. Finally, according to respondents, improving the profitability of companies in the industry, improving awareness and perceptions of the sector as a potential source of employment for youth, and strengthening the education and training programs focused on forestry are the key issues facing the industry.

Forestry Nurseries

As was indicated in table summarizing quantitative data by sector (page 62), those employers who reported being primarily involved in forestry nurseries employed an average of roughly 61 FTEs, of which approximately 54 are located in BC. Employment peaks at about 91 FTEs, and projected cumulative growth from 2020 to 2025 is nearly 3%.

As was summarized in the table of qualitative indicators (pages 64-65), when asked about the principal contributors to permanent staff turnover, forestry nursery employers suggested that employees were ready for a change (89%) or had found an opportunity for career advancement (44%). Regarding reasons why field workers do not return, most (80%) respondents indicated employees moving to another employer outside the sector, and the most highly scored reason that seasonal workers leave the sector was the general nature of the work. Forestry nursery employers indicated that candidates with the required work ethic/commitment, physical skills or endurance, and technical skills are difficult to find, and most (92%) reported recruiting through their existing employees and relying on new and returning employees to contact them (75%) as their main forms of employment opportunity promotion. However, the majority (71%) did indicate that they increased the wages or benefits of certain positions to make them more attractive.

The primary impacts of COVID-19 were reported as an increase in the number of health and safety measures that employers implemented, the level of stress felt by employees, and the costs associated with field operations, with 15% of employers stating that they had created a new position in response to COVID-19.

In terms of the drivers of industry growth, respondents highlighted overall industry revenues (85%) and market share (77%). Lastly, forestry nursery employers indicated that improving awareness and perceptions of the sector as a potential source of employment for youth, finding ways to keep workers in the sector longer, and strengthening education and training programs focused on forestry are the key issues facing the industry.

4. SURVEY OF EMPLOYEES

Throughout this section the term *active employees* will be used to indicate employees who worked in the sector during 2020, including both seasonal and year-round employees. The term *former employees* will be used to indicate employees who worked in the sector prior to 2020, including both seasonal and tear-round employees.

4.1 Employment in 2020

- **Of the 907 employees surveyed, 93% were employed in the industry in BC in 2020.**

  In 2020, these employees were most commonly employed by tree planting operations as indicated in the table below.

Employees by Employment Operation Type in 2020

Operation	2020 Employees	
	#	%
Number Surveyed	**907**	**100%**
Tree planting	695	77%
Brushing and spacing	125	14%
Forestry consulting	109	12%
Silviculture nursery	62	7%
Wildfire fighting	50	6%
Site preparation	23	3%
Did not work in the industry in 2020	62	7%
Other	125	14%

  The 62 respondents who did not work in the industry in 2020 had previously been employed in the industry, including 34 who had worked in the industry in 2019. Of the 845 active employees, 66% worked for one employer, 23% worked with two employers, and 10% worked with three or more employers in the silviculture industry.

- **Of those active employees, 81% were hired for seasonal positions, 97% were employed full-time, and 32% also worked in other jurisdictions in silviculture in 2020.**

  As indicated in the table below, of the 845 employees surveyed, 81% are seasonal workers, and 18% are year-round, including 4% who worked only part of the year.

Active Employees by Type of Work

Type of Work	Employees Surveyed	
	#	%
Seasonal	685	81%
Year-round	120	14%
Year-round (permanent) position, but only worked part of the year	38	4%
Other	2	0%
Total	**845**	**100%**

In terms of job status, almost all (97%) active employees worked full time during 2020. More specifically, 99% of seasonal workers and 97% of year-round workers indicated working full time.

Active Employees by Hours of Work

Hours of Work	Employees Surveyed	
	#	%
Full-time (more than 25 hours a week)	818	97%
Part-time (less than 25 hours a week)	12	1%
Other or Not Noted	15	2%
Total	**845**	**100%**

Active employees indicated that they worked an average of 17.6 weeks in the silviculture industry in 2020, with 55% working 15 weeks or less. Of those active employees, 49% indicated that they would have worked more weeks in 2020 if the work had been available.

One-third (268) of active employees were based outside of BC for at least part of the year while working in the silviculture industry. The most common locations were Alberta (175), Quebec (35), and Ontario (28).

- **Most active employees worked primarily in the field in 2020, most of whom lived in a camp or stayed in a motel, hotel or lodge.**

  Of those who worked in 2020, 691 indicated that they worked principally in a field position. Of these workers, 61% indicated that they most commonly lived in a camp.

Active Field Employees by Work Accommodations
While working in the field, were you most commonly:

Responses	Employees Surveyed	
	#	%
Living in camp?	422	61%
Staying in a motel, hotel or lodge?	252	36%
Able to stay in your community and home?	130	19%
Other (please specify)	27	4%
Total Working in the Field	**691**	**100%**

- **Field staff commonly fulfill a number of roles, working part of their time in one position and part in one or more other positions.**

The field employees were asked to identify the type of position in which they spent the most time as well as what other types of positions they filled over the course of the year. Of the 691 field staff, 437 identified more than one position. As indicated, the respondents most commonly identified field worker (e.g., tree planter, spacer or brusher, wildfire fighter, forest tech etc.), crew leader (leads small group of field staff) (e.g., 5-15 employees), and supervisor or project manager (i.e., person to whom crew leader reports, who is responsible for operations in an area, region or project).

Field Staff by Primary and Other Positions

Type of Field Positions	Primary Position		Other Positions	
	#	%	#	%
Total	**691**	**100%**	**691**	**100%**
Field worker (e.g., tree planter, spacer or brusher, wildfire fighter, forest tech etc.)	490	71%	323	47%
Crew leader (leads small group of field staff (e.g., 5-15 employees).	103	15%	77	11%
Supervisor or project manager (i.e., person to whom crew leader reports. Responsible for operations in an area, region or project.)	46	7%	44	6%
Other camp support (e.g., truckers, tree runners)	24	3%	7	1%
Camp cook	5	1%	42	6%
Other or not noted	23	3%	51	7%

The specific positions that were most commonly identified by the field workers in an open-ended question included tree planter (458), crew boss (59), supervisor (19), wildfire fighter (19), forestry consultant (19), grower/ nursery worker (17), checker (12), surveyor (12), cook (10), safety coordinator (9), labourer (8), and brusher/spacer (8).

The crew leaders indicated that they managed an average of 12 staff members while supervisors indicated that they managed an average of 36 staff members.

4.2 Employment in Previous Years

- **Most active and former employees first became aware of opportunities for them to work in silviculture from friends, acquaintances or others already in the sector.**

When asked how they first became aware of the job opportunities in the sector, 400 (62%) of the 642 active employees indicated that they had first become aware through friends or acquaintances, with 285 (44%) having first become aware from people already in the industry. Former employees reported 59 (39%) having first become aware through friends or acquaintances, and 60 (39%) having first become aware through people already in the industry.

Initial Source of Awareness of Job Opportunities in the Silviculture Sector

Method	Active Employees		Former Employees	
	#	%	#	%
Total	**642**	**100%***	**153**	**100%***
Became aware from friends or acquaintances	400	62%	59	39%
Became aware from people already in the industry	285	44%	60	39%
Had a family connection to the industry	138	21%	35	23%
Became aware through my education programs	50	8%	36	24%
From seeing job ads or postings (e.g., Indeed, Zip Recruiter)	41	6%	35	23%
Through social media (e.g., Facebook, Instagram)	39	6%	5	3%
Through a job fair	4	1%	5	3%
Other	28	4%	20	13%

**Responses are not mutually exclusive, will not sum to 100%.*

- **Over half of the active employees who were surveyed have worked in the industry for more than five years and most have worked for multiple employers.**

When asked about the number of years they have worked in the industry, 408 (53%) of the 777 active employees indicated that they had been in the industry for more than five years, while only 17 (33%) of the 51 former employees reported having worked in the industry for more than five years. In terms of the number of employers that employees have worked for, the majority have worked for less than four, with 461 (60%) of the 768 active employees and 33 (65%) of the 51 former employees having worked for three or less employers during their careers in the industry.

Active Employees by Years Worked & Employers

Number of Employers Worked For	Number of Calendar Years		Number of Employers Worked For	
	Active	Former	Active	Former
1	68	10	185	22
2-3	159	14	276	11
4-5	132	10	122	10
6-9	185	9	112	6
10 or more	223	8	73	2
Total	**777**	**51**	**768**	**51**

- **Over the course of their career, 28% of active employees and 19% of former employees have worked in more than one silviculture sector.**

  As indicated in the table below, while most active and former employees have worked in tree planting, about 28% of active and 19% of former employees have worked in more than one type of operations in the sector.

Types of Operations Active and Former Employees Have Worked In

Operation	Active Employees		Former Employees	
	#	%	#	%
Number Surveyed	**907**	**100%**	**59**	**100%**
Tree planting	695	77%	48	81%
Brushing and spacing	125	14%	6	10%
Forestry consulting	109	12%	1	2%
Silviculture nursery	62	7%	3	5%
Wildfire fighting	50	6%	8	14%
Site preparation	23	3%	2	3%
Did not work in the industry (in 2020/never)	62	7%	8	14%
Other	125	14%	5	8%
Employees worked in more than one type of operations in the sector	**256**	**28%**	**11**	**19%**

4.3 Perceptions of the Industry and Employers

- **On average, both active and former employees were satisfied with their experiences in working in the sector.**

  When asked to rate their actual experience working in the sector, most (77%) active employees indicated that they were satisfied with their experience, with over a third (35%) being very satisfied. The majority (64%) of former employees also reported being satisfied with their experience, however only 16% indicated that they were very satisfied. The average rating was 4.1 across the 645 active employees and 3.7 across the 50 former employees.

Employee Satisfaction with Job Experience

On a scale of 1 to 5, where 1 is not at all satisfied, 3 is somewhat satisfied and 5 is very satisfied, how satisfied have you been with your actual experience in working in this sector?

Satisfaction with Job Experience	Active Employees		Former Employees	
	#	%		
1 Not-at-all satisfied	6	1%	0	0%
2	17	2%	5	10%
3 Somewhat satisfied	157	20%	13	26%
4	327	41%	24	48%
5 Very satisfied	289	36%	8	16%
Total	**796**	**100%**	**50**	**100%**
Average Rating	**4.1**		**3.7**	

**Active employees included both seasonal and year-round employees. Satisfaction ratings between seasonal and year-round employees were very similar with year-round employees being slightly more satisfied (4.2 average rating from year-round employees vs 4.1 from seasonal employees).*

- **Relative to other jobs they might have been doing, employees saw the relationships with co-workers, the wages, their ability to do the work, and the setting as the major advantages of working in the industry.**

  On the other hand, the most commonly identified disadvantages included the working conditions, the predictability of how much work will be available, the transient or mobile lifestyle, the seasonality of the work, the physicality of the work, and the opportunities for advancement.

Advantages and Disadvantages Relative to Other Jobs

Question: Relative to other work that you might be doing, what do you see as the advantages and disadvantages of working in your position in this sector?

Factors	Disadvantage		Neither	Advantage		Total
	Major	Minor		Minor	Major	
The relationships with co-workers (n=830)	1%	3%	14%	24%	58%	100%
My ability to do the work (n=833)	0.4%	3%	13%	30%	53%	100%
The wages (n=834)	3%	9%	8%	28%	52%	100%
The setting (n=830)	2%	9%	11%	27%	50%	100%
The sense of fulfilment from doing the work (n=834)	2%	5%	15%	33%	45%	100%
The seasonality of the work (n=681, seasonal workers)	7%	16%	12%	27%	37%	100%
The physicality of the work (n=686, seasonal workers)	7%	17%	17%	32%	28%	100%
The transient or mobile lifestyle (n=623, seasonal workers)	9%	19%	22%	25%	25%	100%

Factors	Disadvantage		Neither	Advantage		Total
	Major	Minor		Minor	Major	
The predictability of how much work will be available (n=672, seasonal workers)	13%	29%	17%	21%	21%	100%
The opportunities for advancement (n=824)	9%	15%	30%	28%	18%	100%
The working conditions (n=832)	5%	28%	29%	23%	15%	100%

- **On average, active employees were satisfied with the employer in this sector for whom they worked in 2020.**

When asked about their level of satisfaction with their predominant employer, the majority (73%) of seasonal employees reported being satisfied, with 45% being very satisfied. The averaged satisfaction level was 4.0 across the 632 respondents. Similarly, 78% of year-round employees were also satisfied with their employer, including 52% who are very satisfied. The average satisfaction level was 4.2, rated by 151 respondents.

Employees by Satisfaction with Predominant Employer

On a scale of 1 to 5, where 1 is not at all satisfied, 3 is somewhat satisfied and 5 is very satisfied, how satisfied are you with the employer in this sector with whom you worked in 2020 (if you worked for more than one employer, answer in relation to the employer for which you worked the most days)?

Satisfaction with Employer	Seasonal Employees		Year-round Employees	
	#	%	#	%
1 = Not-at-all satisfied	26	4%	1	1%
2	41	6%	8	5%
3 = Somewhat satisfied	100	16%	24	16%
4	179	28%	39	26%
5 = Very satisfied	286	45%	79	52%
Total	632	100%	151	100%
Average Score	**4.0**		**4.2**	

Most employers were rated highly in terms of the tolerance for individuality, concern for the safety of employees, and maintaining a respectful workplace free from harassment and bullying. The area of most common concerns related to camp costs, environmental stewardship, and the lack of support in assisting workers prepare for the season (e.g., support related to fitness preparation, training, equipment, etc.).

Employee Rating of Employer Factors

On a scale of 1 to 5, were 1 is not at all high, 3 is somewhat high, and 5 is very high, how highly would you rate this employer in terms of:

Employer Factors	AVG	% Very High
Tolerance for individuality	4.35	61%
Concern for the safety of employees	4.24	59%

Employer Factors	AVG	% Very High
Maintaining a respectful workplace free from harassment and bullying	4.18	55%
Quality of tools and equipment made available to you	4.10	46%
Quality of management/supervisor support	4.04	47%
Treating all employees fairly (e.g., in assignments of tasks or work locations)	3.97	46%
Meal options at camp	3.96	46%
Organization & logistics	3.94	44%
Camp accommodations	3.90	39%
Hotel, motel or lodge accommodations	3.73	33%
Environmental stewardship	3.66	35%
Assisting workers prepare for the season (e.g., support related to fitness preparation, training, equipment, etc.)	3.59	31%
Charges for camp costs	3.20	25%

- **Approximately two-thirds of seasonal employees were expecting to return to the same employers in 2021, while 21% expected to continue to work in the sector but for a different employer and 6% were not expected to work in the sector in 2021.**

  A summary of active seasonal employees' plans and expectations for 2021 are displayed in the table below.

Active Seasonal Employees by 2021 Expectations

Response	Employees Surveyed	
	#	%
Return to the same employer	422	67%
Continue to work in the sector but for a different employer	135	21%
Not work in the sector	39	6%
Not sure	23	4%
Other (please specify)	11	2%
Total Seasonal Employees	**630**	**100%**

The primary reasons why active seasonal employees were planning to change employers were a desire to find better pay and better working conditions as well as just being ready for a change.

Reasons Why Active Seasonal Employees Change Employers

Reasons	Employees Surveyed	
	#	%
Opportunity for better pay	90	69%
Looking for better working conditions	80	62%
Ready for a change	72	55%
Opportunity for more and steadier work	46	35%
Opportunities for career advancement	40	31%
Issues with a manager or co-worker	36	28%
Other (please specify)	26	20%
Not recruited by my 2020 employer for 2021	5	4%
Not sure	1	1%
Total	130	**100%**

The primary reasons why active seasonal employees were planning to leave the industry were the desire to pursuing work related to their education, find better opportunities for career advancement and less physically demanding work.

Reasons Why Active Seasonal Employees Leave the Sector

Reasons	Employees Surveyed	
	#	%
Pursuing work related to my education	23	61%
Looking for better opportunities for career advancement	22	58%
Looking for less physically demanding work	17	45%
Looking for more and steadier work	12	32%
Looking for better working conditions	9	24%
Looking for better pay	8	21%
Other (please specify)	7	18%
Concerns about the impact of COVID-19 on safety or working conditions	2	5%
Not sure	0	0%
Total	**38**	**100%**

It should be noted that 26 of the former employees were expecting to return to work in the industry in 2021 while 14 indicated no and 8 were not sure. Those 14 former employees also indicated reasons why they stopped working in the industry: pursued work related to education (9 of 14), left for better opportunities for career advancement (7), and left for more and steadier work (5).

- **On average, the seasonal employees who expressed an opinion were somewhat interested in the opportunities for career advancement, while year-round employees are more likely to be interested.**

  When asked about their interest in opportunities for career advancement in the sector, about half (45%) of seasonal employees indicated that they were interested (rating of 4 or 5), with 28% being very interested. However, the average rating was 3.4, indicating that on average, seasonal employees are only somewhat interested in opportunities for career advancement.

  On the other hand, nearly 70% of year-round employees indicated that they are interested (rating of 4 or 5) in career advancement with 47% being very interested. The average rating was 4.0, implying that, on average, year-round employees are interested in career advancement.

Active Employees by Interest in Career Advancement

On a scale of 1 to 5, where 1 is not at all interested, 3 is somewhat interested and 5 is very interested, how interested would you be in further advancing your career in this sector?

Career Advancement	Seasonal Employees		Year-round Employees	
	#	%	#	%
1 = Not-at-all interested	81	13%	9	6%
2	79	12%	8	5%
3 = Somewhat interested	187	29%	33	22%
4	110	17%	29	19%
5 = Very interested	180	28%	71	47%
Total	**637**	**100%**	**150**	**100%**
Average Score	**3.4**		**4.0**	

- **Only about 25% of the seasonal employees who expressed an opinion are considering or will definitely make this sector a career while 38% expected to work at least a few more years. In contrast, nearly 60% of year-round employees are considering or will definitely make this sector a career.**

  Most of the seasonal employees who expressed an opinion are not considering pursuing a career in the sector, with 7% expecting that 2021 will be their last year in the sector, 38% expecting to remain in the sector for at least a few more years, and 29% being unsure about their future in the sector. About one quarter of respondents indicated that they are considering or will definitely be staying in the industry as a career. On the other hand, the majority (58%) of year-round employees are considering or will definitely be staying in the industry. Of those 7 year-round employees who indicated that 2021 may be their last year, this was mostly because they are looking for better opportunities for career advancement (5 out of 7).

Active Employees by Long Term Outlook

How many more years are you likely to work in this sector?

Response	Seasonal Employees		Year-round Employees	
	#	%	#	%
For at least a few more years	222	38%	37	25%
Unsure (e.g., take it year-by year)	171	29%	20	13%
Considering or definitely will be making this a career (e.g., staying in the industry)	150	25%	87	58%
Expect that 2021 will be my last year	40	7%	7	5%
Other (please specify)	8	1%	-	-
Total	**591**	**100%**	**151**	**100%**

Roughly half of the employees who provided an opinion on what employers can (or could have) do (or done) to encourage them to continue working for them indicated increasing wages and/or reducing the costs faced by employees as the primary action. Additionally, 21% of respondents reported that by better addressing workplace issues, employers could encourage them to continuing working for them.

The following table summarizes the potential employers' actions indicated by employees.

Employer Actions to Retain Employees

What could an employer do (or have done) to encourage you to continue to work with them?

Employer Actions	Responses	
	#	%
Increase wages and/or reduce costs (e.g. pay higher wages, reduce or eliminate camp costs, ensure wages are paid on time, provide bonuses, pay for work outside of job description)	286	46%
Address workplace issues (e.g. address occurrences of bullying and harassment, promote the respectful treatment of employees, create more diversity, employ more women in management, address health and safety concerns, create a more supportive and inclusive workplace)	130	21%
Increase transparency and communication (e.g. in terms of pay, contracts, operations, job expectations, actively listening to worker feedback)	75	12%
Provide more career advancement opportunities (e.g. provide opportunities for employees to take on responsibility, communicate a clear advancement path, provide varied work experience, reward hard work, identify and promote quality management)	74	12%
Nothing, employee does not plan on return or does not need any encouragement to return.	58	9%

Employer Actions	Responses	
	#	%
Provide more work (e.g., provide longer seasons or more consistent work)	55	9%
Provided better working conditions (e.g., improve food and/or accommodations quality, more showers/bathrooms, extend camp services, provide the flexibility to work from home when possible)	46	7%
Provide benefits or supports (e.g., health benefits, physiotherapy, mental health support, off-season benefits, maternity/paternity leave)	44	7%
Improve training (e.g., provide more opportunities, ensure employees are equipped to work safely, provide harassment/bullying training)	44	7%
Be more environmentally conscious (e.g., create a recycling plan, waste reduction initiative, reduce carbon footprint, improve land management practices)	7	1%
Total	**812**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

- **Supervisors are most commonly motivated by the opportunity to gain management experience and their preference for a higher-level position that includes increased levels of responsibility.**

  When asked about the motivating factors that drove them to take on a supervisor role, the majority of supervisors indicated that the opportunity to gain management experience was very important (63%) and that they preferred a higher-level position and the increased responsibility that comes with it (57%). Roughly half of respondents reported that having more days available to work was somewhat important (45%), and some indicated that earning a higher average hourly wage was also somewhat important.

Supervisors by Job Motivation Factors

Factors	Level of Importance			Total
	Not Important	Somewhat Important	Very Important	
	%	%	%	
Higher average hourly wage rates (n=193)	19%	43%	38%	**100%**
More days available to work (n=193)	31%	45%	25%	**100%**
Prefer the higher-level position/ increased responsibility (n=197)	16%	27%	57%	**100%**
Opportunity to gain management experience (n=194)	13%	24%	63%	**100%**
Preferred that to working as a field worker (n=195)	40%	41%	19%	**100%**
Reduced likelihood of physical injury (n=192)	34%	35%	30%	**100%**

The majority of supervisors find their workload to be more than they expected and about half find their job more difficult than expected.

Supervisors were also asked to compare their experience on the job against what they expected it to be like when they took the role. The majority (66%) find the workload to higher, with 33% reporting that it is significantly higher. Nearly half (46%) find the job to be more difficult than they expected, while over a third (38%) indicated that their income is higher than expected.

Supervisors by Job Experience vs. Expectations

Job Factors	Comparison to Expectations					Total
	Significantly Lower	Somewhat Lower	About The Same	Somewhat Higher	Significantly Higher	
	%	%	%	%	%	
Income (n=192)	3%	18%	42%	28%	10%	**100%**
Workload (n=192)	1%	5%	28%	33%	33%	**100%**
Level of company support (n=193)	7%	17%	43%	25%	8%	**100%**
Difficulty of the job (n=193)	1%	7%	46%	35%	11%	**100%**

4.4 Education and Training

- **While being employed in the sector, most employees have received a range of training from their employers.**

When asked about the training or education they had received from one or more of their employers, most employees indicated that they had received some form of training or education from their employer, the most common forms were reported as health and safety training (94%), onboarding or orientation training (83%), or emergency drills or mock-ups training (73%).

Employees by Training Received

Form of Training	#	%
Number of Respondents	**734**	**100%***
Health and safety training	692	94%

Form of Training	#	%
Number of Respondents	**734**	**100%***
An onboarding/orientation session when you joined the organization	612	83%
Emergency drills or mock-ups	537	73%
Technical workshops or seminars on topics relevant to your position	342	47%
Management or supervisory training	276	38%
Funding for multi-day technical training from an outside source	239	33%
A formal mentoring program	102	14%
Other types of training or education (please specify)	89	12%

**Responses are not mutually exclusive, will not sum to 100%*

- **The majority of employees found the training they received useful to them in their positions.**

Employees were asked to rate the training they had received in terms of it its usefulness to them in their position. The majority of respondents (58%) found the training to be useful, with 34% finding it very useful. Some (32%) employees found the training only somewhat useful, thus the average rating across the 727 responses was 3.8.

Usefulness of Training Received

On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat useful, and 5 is very useful, how useful was this to you in your position?

Usefulness of Training	Employees Surveyed	
	#	%
1 = Not-at-all useful	20	3%
2	50	7%
3 = Somewhat useful	235	32%
4	177	24%
5 = Very useful	245	34%
Total	**727**	**100%**
Average Score	**3.8**	

Employees were also asked what additional training or support would be useful to them in their position. The most common responses are listed below:

- Additional first aid training (e.g. OFA3, emergency first aid)
- Danger tree assessment and faller training
- Driver safety training
- Mental health awareness training
- Silviculture surveying/mapping training
- Workplace harassment training
- Personal finance training

- Physical health and personal well-being training (e.g. injury prevention)
- Management and professional development training

4.5 Impact of COVID-19

- **While most employees felt that their employers had implemented appropriate health and safety measures in response to the pandemic, most also noted at least somewhat of an increase in the stress felt by the employees with whom they worked in 2020.**

  Employees were asked to rate, on a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat appropriate and 5 was very appropriate, how appropriate they thought the COVID health and safety measures implemented by their employer were. Most employees (77%) felt that the health and safety measure were appropriate, with roughly half (51%) finding them very appropriate. The average rating was 4.2 across the 783 respondents.

  Employees were also asked to rate, on a scale of 1 to 5, where 1 was not at all, 3 is somewhat and 5 is a great deal, to what extent they think the presence of COVID-19 impacted the stress felt by the employees with whom they worked in 2020. Most employees (83%) indicated that they think COVID-19 increased the level of stress felt by their co-workers during 2020 at least somewhat, with nearly a quarter (24%) believing that it impacted co-worker's stress a great deal. The average rating was 3.5 across the 782 respondents.

Appropriateness of Health & Safety Measures and Stress from COVID-19

On a scale of 1 to 5 – Appropriateness of COVID H&S measures	#	%	On a scale of 1 to 5 - Stress from COVID	#	%
Not at all appropriate - 1	16	2%	Not at all -1	42	5%
2	24	3%	2	93	12%
Somewhat appropriate - 3	137	17%	Somewhat - 3	267	34%
4	204	26%	4	193	25%
5 - very appropriate	402	51%	Great deal - 5	187	24%
Total	**783**	**100%**	**Total**	**782**	**100%**
Avg rating	**4.2**		**Avg rating**	**3.5**	

Employees were also asked to comment on why they had rated the appropriateness of the COVID health and safety measures their employer had implemented the way they did. The most common themes are listed below:

- The measures were appropriate because they were effective at preventing the spread of COVID (e.g. Workplace experienced no cases).

- The measures put in place were comprehensive and met or exceeded industry standards.
- The measures allowed employees to feel safe while at work.
- Without the measures, work could not have continued.
- Measures were organized and implemented efficiently.
- Measures helped to protect local communities.
- Measures were explained and communicated clearly.
- Measures were highly enforced.
- Employer took the health and safety measures very seriously.
- While the majority of measures seemed necessary, some seemed unnecessary or redundant.
- Some measures created unnecessary stress or frustration amongst employees.

- **Those employees who are concerned about COVID-19 health and safety measures during the 2021 season are primarily concerned about the behaviour of their co-workers and the potential for them to not follow COVID protocols and the mental health related impacts resulting from COVID related stress.**

  Employees were asked about any concerns they may have regarding COVID-19 health and safety measures heading into the 2021 work season.

Employees by COVID-19 Health & Safety Concerns

Employee Concerns	Responses	
	#	%
Co-workers not following COVID protocols (e.g., self-isolation, social distancing, safety on days-off, differing levels of concern regarding COVID, COVID fatigue, safety during travel)	83	19%
Mental health concerns (e.g., stress on workers, mental health supports needed, isolation in camp on days-off, burn out)	80	19%
Anti-protocols (e.g., Operations should be similar to pre-COVID status, frustrated with restrictions, not concerned about COVID, believes restrictions should be lifted/altered, concerned about lack of services available under current restrictions)	73	17%
Personal and co-worker safety (e.g., concerned about themselves or a co-worker contracting the virus, personal health issues)	58	14%
Employers enforcing the necessary safety protocols (e.g., During camp breakdown/set up, during the initial 14 days in camp, during general operations, not taking protocols seriously)	38	9%
Government protocols/regulations (e.g., Concerned they may not be strict enough, effective at containing the virus, mandatory testing)	33	8%

Employee Concerns	Responses #	Responses %
Putting small or remote communities at risk (e.g., Spreading the virus and/or new variants, First Nations communities, areas with limited healthcare services)	30	7%
Risk of losing work (e.g., Shutdowns due to COVID, outbreak in camp, reduced work available, reduced pay as a result of higher costs for employers)	29	7%
Vaccinations (e.g., Will everyone be vaccinated, will employers require workers to be vaccinated, missing opportunity to get vaccinated if working, does not want to have to take the vaccine)	18	4%
Total	**442**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

- **Approximately half of employees indicated that they would like the heightened personal hygiene and sickness prevention standards brought about as a result of COVID-19 to continue permanently.**

Employees were asked if they would like to see any of the health and safety measures implemented during 2020 in response to COVID-19 continue permanently, and nearly half (48%) reported that they would like to see the continuation of the improved personal hygiene and sickness prevention standards, such as increased hand washing and access to hand sanitizer. Over a quarter (27%) of respondents also indicated that they would like to see the increased levels of workplace cleaning and support staff continued permanently.

Continuation of COVID-19 Health & Safety Measures

Health and Safety Measures	Responses #	Responses %
Improved personal hygiene and sickness prevention standards (e.g., mandatory/frequent hand washing (especially before group transport), readily available hand sanitizer and hand washing stations, food service provided (not buffet style), no tolerance for working while sick, mask wearing while in enclosed spaces)	249	48%
Increased workplace cleaning and support staff (e.g., designated cleaning staff, more kitchen staff, regular sanitization of common areas and vehicles)	139	27%
Improved camp services/protocols (e.g., laundry service, internet access, more recreation and dining space, camp store, more bathroom facilities)	94	18%
Physical distancing measures (e.g., 1 person per room in accommodations, less people per vehicle, spaced dining areas)	72	14%
Reduced mobility (e.g., option to spend days off spent in camp with food provided, work pods, staggered mealtimes, limit interactions	72	14%

Health and Safety Measures	Responses	
	#	%
with local community, camp runner to pick up supplies, work from home when feasible)		
All health and safety measures	14	3%
Improved access to support services (e.g., mental health services, physiotherapists, remote doctors, counsellors)	12	2%
Total	**652**	**100%***

**Responses are not mutually exclusive, will not sum to 100%*

4.6 Key Issues

- **While employees identified a wide variety of issues facing the industry, no one issue was identified as a high priority by a majority of the employees.**

  We developed a list of potential issues that may need to be addressed to strengthen the sector. The employees were then asked to rate, on a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority and 5 is a major priority, how much of a priority they thought the sector should place on those issues. As indicated below, the highest rated priorities were increasing access to resources to support mental health (3.96), finding ways to keep people in the sector for longer (e.g., increasing employment opportunities/providing opportunities for career advancement/better retention strategies) (3.92), better addressing harassment and bullying in the workplace (3.88), and strengthening training and support provided to new employees and those already in the sector (3.75).

Employee Perceptions of The Level Of Priority That Should Be Placed on Various Industry Issues

On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority and 5 is a major priority, how much of a priority do you think should the sector place on the following issues?

Potential Issues	Avg Rating	% Major Priority
Increasing access to resources to support mental health	3.96	42%
Finding ways to keep people in the sector for longer (e.g., increasing employment opportunities/providing opportunities for career advancement/better retention strategies)	3.92	40%
Better addressing harassment and bullying in the workplace	3.88	44%
Strengthening training and support provided to new employees and those already in the sector	3.75	27%
Improving health and safety measures	3.73	31%
Improving adherence to employment standards/addressing gaps in existing policies and structures	3.67	29%
Increasing the diversity of the work force (e.g., increasing participation of women, Indigenous, ethnic minorities, recent immigrants, etc.)	3.54	32%

Potential Issues	Avg Rating	% Major Priority
Strengthening education and training programs focused on forestry	3.50	21%
Addressing concerns related to camp costs	3.48	32%
Better preparing new and returning seasonal workers for the start of the season (e.g., equipment, fitness level, safety awareness, skills training)	3.39	20%
Improving awareness and perception of the sector as a potential source of employment for youth	3.23	19%
Improving the profitability of the companies in the industry	3.22	22%
Accelerating the adoption of new technology in the workplace	3.12	15%
Addressing business succession issues	3.02	13%

- **Employees provided a wide range of recommendations regarding actions that could be taken to improve labour market conditions in the sector.**

  The major themes and recommendations are summarized in the table below. The number of times each theme was mentioned is provided in brackets.

Employee Recommendations to Improve Labour Market Conditions

Theme	Recommendations
Wages and Benefits (205)	▪ Standardize tree-planting fees so that companies can pay same wages ▪ Pay fair wages and top up those not meeting minimum wage ▪ Ensure wages keep up with inflation/rising costs of living ▪ Too hard to make good money, very few can do it but it's hard on planter ▪ Eliminate unpaid labour (camp set up, take down, moving) ▪ Include pay for other costs (camp fees, rent, travel time, food) ▪ Forest tech/supervisor can make much less than planters ▪ Paid sick days/ medical benefits (muscular issues)/extended health benefits/vacation pay
Environment (170)	▪ Less waste (gloves, socks, etc.)/reduce trash in camps, more recycling ▪ Ensure protection of biodiversity/reduce monoculture planting ▪ More sustainable camps ▪ Get rid of pesticides/herbicide ▪ Protect old growth forest ▪ Reduce use of plastics/ use biodegradable materials/no flagging tape ▪ Focus on sustainability and addressing climate change
Health and Safety (115)	▪ Mental health and addiction support ("binge drinking culture is rampant") ▪ Harm reduction strategies (drugs, alcohol, injuries)/more training ▪ Extended health coverage ▪ Safety equipment (communication device, safe roads) ▪ Training around risks/prevention of injuries ▪ Better access to blocks/loading quads for transportation safer ▪ Cultural of safety
Increase Retention (100)	▪ More benefits for returning workers ▪ Same respect for tree planters as other workers in forestry (safety, protection, 'roads'…) ▪ Overtime pay for long hours

Theme	Recommendations
	▪ Create more full time/permanent/steady positions ▪ More incentives recognizing the seasonality of industry ▪ Reducing penalty for sick day, particularly for women ▪ More guarantee of hours (firefighters) ▪ Reduce stress/hours in transit ▪ Addressing issues around competition, and stress due to competition ▪ Better employment standards
Camps Conditions (80)	▪ Improve facilities (kitchen, accommodation, showers) ▪ Deal with drug/alcohol abuse ▪ Reduce camp costs ▪ Access to internet ▪ Better access to water sources ▪ Improve morale in camps – something to do, fun games, group activities ▪ Improving conditions – recycling, food waste ▪ Better human resources in remote work camps
Diversity (54)	▪ Increase diversity of the workforce, particularly Indigenous people, people of colour, immigrants, women ▪ Ensure Indigenous land/communities are respected ▪ More education on indigenous culture/treaty rights ▪ Partnership with First Nations for contracts ▪ Ensure racial diversity ▪ More women in charge ▪ Address racism
Harassment (45)	▪ Address sexual harassments/party nights ▪ Workplace harassment/bullying – what it is/when it happens ▪ Harsher reprimands for people who are not following protocols/safety ▪ Investigation and discipline of workers accused of harassment

4.7 Demographics

- **Almost two-thirds of the seasonal employees indicated that they reside in BC during the off-season.**

  As indicated below, 64% of the seasonal employees who worked in 2020 reported that they reside in BC during the off-season.

Number Residing in BC During the Off-season

Do you reside in BC during the off-season?	Employees Surveyed	
	#	%
Yes	379	64%
No	176	30%
Other (please specify)	34	6%
Total Working in the Field	**589**	**100%**

On the other hand, of those 176 seasonal employees who did not reside in BC during the off-season commonly reported residing in Quebec, Ontario, Alberta, Nova Scotia, and Manitoba.

Number Residing in Other Province or Region During the Off-season

Province or Region	Employees Surveyed	
	#	%
Quebec	58	35%
Ontario	50	30%
Alberta	21	13%
Nova Scotia	11	7%
Manitoba	10	6%
International	5	3%
New Brunswick	4	2%
Saskatchewan	3	2%
All Over Canada	2	1%
Newfoundland	1	1%
Rhode Island, United States	1	1%
Yukon	1	1%
Total who reported a region	**167**	**100%**

- **The majority of employees surveyed are aged between 21 to 34 years. While gender status is somewhat evenly distributed, nearly half had a bachelor's degree or above.**

  As indicated below, the distribution of employees concentrated in age groups of 21 to 34 years, accounted for almost 75% of the sample surveyed.

Employees By Age Group

Age Group	Employees Surveyed	
	#	%
Under the age of 20	26	3%
21 to 24 years	161	20%
25 to 29 years	267	34%
30 to 34 years	159	20%
35 to 44 years	107	14%
45 to 54 years	30	4%
55 to 64 years	31	4%

Age Group	Employees Surveyed	
	#	%
65 years or over	4	1%
Prefer not to answer	1	0.1%
Total Respondents	**786**	**100%**

Slightly more than half of the employees surveyed are male, and 41% are female.

Employees By Gender

Gender	Employees Surveyed	
	#	%
Male	419	53%
Female	325	41%
Non-binary	21	3%
Prefer not to answer	20	3%
Total Respondents	**785**	**100%**

As illustrated in the table below, approximately 45% of the employees surveyed have a bachelor's degree or above.

Employees By Education Level

Education Level	Employees Surveyed	
	#	%
Bachelor's degree	305	39%
Secondary (high) school diploma	203	26%
College or other non-university certificate or diploma	161	21%
Apprenticeship or trades certificate or diploma	47	6%
Master's degree	46	6%
No certificate, diploma or degree	11	1%
Doctorate	7	1%
Total Respondents	**780**	**100%**

- **Approximately 30% of the employees indicated that they were enrolled in post-secondary education in 2020.**

Of those who are enrolled in post-secondary education in 2020, the most commonly named universities or colleges were Selkirk College, UBC, University of Victoria, Vancouver Island University, and Thompson Rivers University.

Number Enrolled in Post-secondary Education in 2020

Enrolled?	Employees Surveyed	
	#	%
Yes	224	30%
No	497	68%
Don't know	3	0.4%
Prefer not to say	12	2%
Total Respondents	**736**	**100%**

- **Of those employees who indicated their racial identity, approximately 3% identified themselves as Indigenous, and 5% identified themselves as members of a visible minority group.**

Percentage of the sample in terms of Indigenous or visible minority identity is shown in the table below.

Participants' Self-Reported Identities

Response	Indigenous		Visible Minority	
	#	%	#	#
Yes	25	3%	39	5%
No	714	93%	715	91%
Prefer not to say	29	4%	30	4%
Total Respondents	**768**	**100%**	**784**	**100%**

- **The majority of employees surveyed reported an income level between $10,000 to $50,000. 737 employees reported an average of $34,708 annual income.**

As indicated in the table below, 66% of the employees indicated an income level between $10,000 and 49,999, and 20% indicated $50,000 to $99,999.

Employees By Income Level

Age Group	Employees Surveyed	
	#	%
Less than $10,000	58	8%
$10,000 to $49,999	488	66%
$50,000 to $99,999	145	20%
$100,000 or more	15	2%
Prefer not to say	31	4%
Total Respondents	**737**	**100%**
Average	**$34,708**	

4.8 Summary By Sector

The Qualitative Data Summary By Sector table, on the following page, summarizes the key qualitative indicators by sector. As indicated, the tree planting, brushing & spacing, and wildfire fighting sectors accounted for a relatively higher percentage of field workers.

While there seems to be no significant difference in employee satisfaction ratings across sectors, all sectors reported an average rating of 4.0 or above, with the Nursery and Consulting sectors being slightly more satisfied. In terms of usefulness of education and trainings provided, the wildfire fighting, and consulting sectors provided a relatively higher score than the other sectors.

"Relationship with co-workers" is more commonly identified as a major advantage of the position by employees in tree planting, brushing & spacing, and wildfire fighting sectors. The "Predictability of how much work will be available" is a commonly identified major disadvantage of the position within the wildfire fighting, brushing & spacing, and consulting sectors, however this major disadvantage is relatively more significant within the wildfire fighting sector.

While most of the sectors indicated that, on average, employees are at least somewhat interested in advancing their career, the tree planting and brushing & spacing sectors tend to be less interested when compared to the other sectors. In terms of longer-term outlook, employees in the consulting and nurseries sectors are relatively more likely to consider or will be making this a career when compared to other sectors.

While "finding ways to keep people in the sector for longer" appears to be a common issue across all sectors, "strengthening training and support provided to new employees and those already in the sector" appears to be relatively more important in the nurseries, wildfire fighting, and consulting sectors. Moreover, "increasing access to resources to support mental health" is another important issue in the tree planting and brushing & spacing sectors.

Qualitative Data Summary by Sector[58]

(Leading factors presented per indicator)

Qualitative Indicators	Tree Planting	Brushing & Spacing	Forestry Nurseries	Wildfire Fighting	Consulting
Primary positions (#)	▪ Field Workers (469) ▪ Crew Leaders (94) ▪ Supervisors (40)	▪ Field Workers (72) ▪ Crew Leaders (22) ▪ Supervisors (17)	▪ Field Workers (13) ▪ Crew Leaders (2) ▪ Supervisors (3)	▪ Field Workers (23) ▪ Crew Leaders (11) ▪ Supervisors (9)	▪ Field Workers (27) ▪ Crew Leaders (8) ▪ Supervisors (13)
Employee Satisfaction Rating (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.08 (77% satisfied)	▪ 4.04 (71% satisfied)	▪ 4.16 (76% satisfied)	▪ 4.02 (71% satisfied)	▪ 4.17 (80% satisfied)
Top 3 Major Advantages	▪ Wages (63% indicated a major advantage) ▪ Relationship with co-workers (62% indicated a major advantage) ▪ My ability to do the work (54% indicated a major advantage)	▪ My ability to do the work (48% indicated a major advantage) ▪ The setting of the work (48 % indicated a major advantage) ▪ The relationship with co-workers (46% indicated a major advantage)	▪ The sense of fulfillment from doing the work (65% indicated a major advantage) ▪ The setting of the work (54% indicated a major advantage) ▪ My ability to do the work (53% indicated a major advantage)	▪ My ability to do the work (53% indicated a major advantage) ▪ The relationship with co-workers (45% indicated a major advantage) ▪ The sense of fulfillment from doing the work (45% indicated a major advantage)	▪ Setting of the work (54% indicated a major advantage) ▪ My ability to do the work (53% indicated a major advantage) ▪ The sense of fulfillment from doing the work (49% indicated a major advantage)
Top 3 Major Disadvantages	▪ Opportunities for advancement (10% indicated a major disadvantage) ▪ Predictability of how much work will be available (9.5% indicated a major disadvantage) ▪ The transient or mobile lifestyle (9% indicated a major disadvantage)	▪ Predictability of how much work will be available (26% indicated a major disadvantage) ▪ Opportunities for advancement (13% indicated a major disadvantage) ▪ The transient or mobile lifestyle (14% indicated a major disadvantage)	▪ Physicality of the work (17% indicated a major disadvantage) ▪ Wages (13% indicated a major disadvantage) ▪ The transient or mobile lifestyle (11% indicated a major disadvantage)	▪ Predictability of how much work will be available (66% indicated a major disadvantage) ▪ Seasonality of the work (11% indicated a major disadvantage) ▪ The transient or mobile lifestyle (11% indicated a major disadvantage)	▪ Predictability of how much work will be available (27% indicated a major disadvantage) ▪ Seasonality of the work (15% indicated a major disadvantage) ▪ The transient or mobile lifestyle (18% indicated a major disadvantage)
Satisfaction with employer (On a scale 1 to 5, where 1	▪ 4.05 (73% satisfied)	▪ 4.21 (79% satisfied)	▪ 4.11 (78% satisfied)	▪ 4.18 (76% satisfied)	▪ 4.38 (84% satisfied)

[58] The number of respondents to each qualitative question can vary. Percentages and ratings were computed based on those who provided an answer to the question.

Qualitative Indicators	Tree Planting	Brushing & Spacing	Forestry Nurseries	Wildfire Fighting	Consulting
is not at all satisfied, 3 is somewhat, 5 is very satisfied)					
Interest in career advancement (On a scale of 1 to 5, where 1 is not at all interested, 3 is somewhat and 5 is very interested)	▪ 3.36 (46% interested)	3.46 (52% interested)	3.98 (67% interested)	4.09 (69% interested)	3.94 (64% interested)
Longer term outlook in the sector	▪ Considering or definitely will be making this a career (25%) ▪ For at least a few more years (38%)	▪ Considering or definitely will be making this a career (42%) ▪ For at least a few more years (33%)	▪ Considering or definitely will be making this a career (51%) ▪ For at least a few more years (26%)	▪ Considering or definitely will be making this a career (39%) ▪ For at least a few more years (34%)	▪ Considering or definitely will be making this a career (59%) ▪ For at least a few more years (24%)
Usefulness of education and training (On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful)	▪ 3.71 (55% indicated useful)	▪ 3.86 (64% indicated useful)	▪ 3.78 (54% indicated useful)	▪ 4.36 (86% indicated useful)	▪ 4.09 (70% indicated useful)
Appropriateness of the COVID health and safety measures implemented by employers (On a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate)	▪ 4.17 (76% indicated appropriate)	▪ 4.2 (76% indicated appropriate)	▪ 4.32 (81% indicated appropriate)	▪ 4.33 (76% indicated appropriate)	▪ 4.36 (80% indicated appropriate)
COVID-19 impacts on the stress felt by employees in 2020 (On a scale of 1 to 5, where 1 was not at all, 3 is somewhat, and 5 is a great deal)	▪ 3.48 (47% indicated great deal)	▪ 3.37 (45% indicated great deal)	▪ 3.67 (56% indicated great deal)	▪ 3.69 (62% indicated great deal)	▪ 3.56 (52% indicated great deal)
Top 3 highest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is	▪ Better addressing harassment and bullying in the workplace (4.02)	▪ Finding ways to keep people in the sector for longer (4.04)	▪ Finding ways to keep people in the sector for longer (4.27)	▪ Finding ways to keep people in the sector for longer (4.32)	▪ Finding ways to keep people in the sector for longer (4.27)

Qualitative Indicators	Tree Planting	Brushing & Spacing	Forestry Nurseries	Wildfire Fighting	Consulting
somewhat of a priority, and 5 is a major priority)	▪ Increasing access to resources to support mental health (4.08) ▪ Finding ways to keep people in the sector for longer (3.86)	▪ Increasing access to resources to support mental health (3.65) ▪ Improving health and safety measures (3.52)	▪ Strengthening training and support provided to new employees and those already in the sector (3.98) ▪ Better addressing harassment and bullying in the workplace (3.84)	▪ Strengthening training and support provided to new employees and those already in the sector (4.0) ▪ Strengthening education and training programs focused on forestry (3.82)	▪ Strengthening training and support provided to new employees and those already in the sector (4.01) ▪ Strengthening education and training programs focused on forestry (3.95)
Top 3 lowest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Accelerating the adoption of new technology in the workplace (2.99) ▪ Improving awareness and perception of the sector as a potential source of employment for youth (3.14) ▪ Addressing business succession issues (2.95)	▪ Accelerating the adoption of new technology in the workplace (3.04) ▪ Increasing the diversity of the work force (3.03) ▪ Addressing business succession issues (3.02)	▪ Improving the profitability of the companies in the industry (3.0) ▪ Increasing the diversity of the workforce (3.24) ▪ Addressing concerns related to camp costs (3.31)	▪ Better preparing new and returning seasonal workers for the start of the season (3.32) ▪ Addressing concerns related to camp costs (3.32) ▪ Increasing the diversity of the work force (2.98)	▪ Better addressing harassment and bullying in the workplace (3.35) ▪ Addressing concerns related to camp costs (3.3) ▪ Increasing the diversity of the workforce (3.45)

4.9 Summary By Position

Field Workers

The Qualitative Data Summary By Type of Position table, on the second following page, summarizes the key qualitative indicators by type of position. As indicated, field workers had an average response rate of 4.08 for the employee satisfaction rating, where 1 is not at all satisfied, and 5 is very satisfied. Based on their responses, 77% of field worker employees were satisfied with their employers.

When asked about the top three major advantages of their position, field workers indicated the following as major advantages: relationships with co-workers (61%), the wages (62%) and the ability to do the work (54%). In contrast, field workers cited the following as the top three major disadvantages of their position: opportunities for advancement (11%), predictability of how much work will be available (10%) and working conditions (7%). In terms of field worker employee's satisfaction with their employer, an average response rating of 4.08 (75%) was achieved, based on a scale of 1 to 5, where 1 is not at all satisfied and 5 is very satisfied.

Field workers were also asked about their interest in career advancement. Based on a scale of 1 to 5, where 1 is not at all interested and 5 is very interested, it appears that field workers are generally interested in the possibility of advancement, as an average rating of 3.35, or the equivalent of 46% of field workers expressed interest in the idea.

When questioned about their longer-term outlook in the sector, less than a third (23%) of field workers considered or would definitely pursue this line of work as a career, with 40% advising that they would remain in the field for at least a few more years.

On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful, field workers provided an average rating of 3.67 (54%) in terms of the usefulness of education and training in obtaining and performing the positions they are hired for.

Seventy-seven percent of field workers felt that their employers had implemented appropriate COVID-19 health and safety measures, when questioned on the appropriateness based on a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate, equating to an average response rate of 4.22. Under half of the field workers surveyed noted a direct impact on stress levels felt by employees as a result of the pandemic, with 44% indicating an impact.

When asked about the top 3 highest rated issues in terms of priorities on a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority, field workers indicated the following as the most pressing priorities: increasing access to resources to support mental health (4.04), better addressment of harassment and bullying in the workplace (3.89) and the need to find ways to keep people in the sector for longer (3.78). Contrastingly, when posed the same question regarding the top 3 lowest rated issues in terms of priorities, field workers noted the following as the least rated priorities: improving the profitability of the companies in the industry

(3.09), accelerating the adoption of new technology in the workplace (2.96), and addressing business succession issues (2.9).

Crew Leaders, Supervisors or Managers

In comparison to field workers, crew leaders, supervisors and managers, expressed a similar satisfaction level (78%) when queried regarding their employee satisfaction rating, where 1 is not at all satisfied, and 5 is very satisfied.

Crew leaders, supervisors and managers indicated the following as the top three major advantages of their position: the relationships with co-workers (61%), the ability to do the work (61%) and the wages (56%). When asked about the top three major disadvantages of their position, the crew leaders, supervisors and managers identified the following disadvantages: the predictability of how much work will be available (20%), the mobile lifestyle (12%) and the working conditions (3%).

On a scale of 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied, crew leaders, supervisors and managers provided an average rating of 4.0 (69%) in terms of their satisfaction with their employer. Crew leaders, supervisors and managers were also asked about their interest in career advancement. Based on a scale of 1 to 5, where 1 is not at all interested and 5 is very interested, these employees provided an average response rate of 3.64 (54%).

When questioned about their longer-term outlook in the sector, 40% crew leaders, supervisors and managers advised they would consider or would definitely pursue this line of work as a career, with 34% advising that they would remain in the field for at least a few more years. Relatedly, sixty-two percent of respondents indicated that education was useful for their position when questioned on its usefulness on a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful.

Seventy-two percent of respondents indicated that their employers had implemented appropriate COVID-19 health and safety measures, when questioned on the appropriateness based on a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate. Relatedly, just over half (58%) of crew leaders, supervisors and managers indicated an impact on stress levels felt by employees as a result of the COVID-19, with an average response rate of 3.66 on a scale of 1 to 5, where 1 was not at all, 3 is somewhat, and 5 is a great deal.

Crew leaders, supervisors and managers, were questioned on the top 3 highest rated issues in terms of priorities on a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority. Respondents indicated the following as the most pressing priorities: finding ways to keep people in the sector for longer (4.15), better addressment of harassment and bullying in the workplace (4.08) and increasing access to resources to support mental health (4.05). When posed the same question regarding the top 3 lowest rated issues in terms of priorities, on a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority, respondents noted the following as the three lowest rates issues: addressing concerns related to camp costs (3.22), accelerating the adoption of new technology in the workplace (3.2) and addressing business succession issues (3.2).

Qualitative Data Summary By Position[59]

(Leading factors presented per indicator)

Qualitative Indicators	Field Workers	Crew Leader, Supervisors or Managers
Employee Satisfaction Rating (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.08 (77% satisfied)	▪ 4.15 (78% satisfied)
Top 3 Major Advantages	▪ The relationships with co-workers (61% indicated a major advantage) ▪ The wages (62% indicated a major advantage) ▪ My ability to do the work (54% indicated a major advantage)	▪ The relationships with co-workers (61% indicated a major advantage) ▪ My ability to do the work (61% indicated a major advantage) ▪ The wages (56% indicated a major advantage)
Top 3 Major Disadvantages	▪ The working conditions (7% indicated a major disadvantage) ▪ The predictability of how much work will be available (10% indicated a major disadvantage) ▪ The opportunities for advancement (11% indicated a major disadvantage)	▪ The predictability of how much work will be available (20% indicated a major disadvantage) ▪ The transient or mobile lifestyle (12% indicated a major disadvantage) ▪ The working conditions (3% indicated a major disadvantage)
Satisfaction with employer (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.07 (75% satisfied)	▪ 4.0 (69% satisfied)
Interest in career advancement (On a scale of 1 to 5, where 1 is not at all interested, 3 is somewhat and 5 is very interested)	▪ 3.35 (46% interested)	▪ 3.64 (54% interested)
Longer-term outlook in the sector	▪ Considering or definitely will be making this a career (23%) ▪ For at least a few more years (40%)	▪ Considering or definitely will be making this a career (40%) ▪ For at least a few more years (34%)
Usefulness of education and training (On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful)	▪ 3.67 (54% indicated useful)	▪ 3.95 (62% indicated useful)
Appropriateness of the COVID health and safety measures implemented by employers (On a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate)	▪ 4.22 (77% indicated appropriate)	▪ 4.06 (72% indicated appropriate)
COVID-19 impacts on the stress felt by employees in 2020 (On a scale of 1 to 5, where 1	▪ 3.43 (44% indicated an impact)	▪ 3.66 (58% indicated an impact)

[59] The number of respondents to each qualitative question can vary. Percentages and ratings were computed based on those who provided an answer to the question.

Qualitative Indicators	Field Workers	Crew Leader, Supervisors or Managers
was not at all, 3 is somewhat, and 5 is a great deal)		
Top 3 highest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Increasing access to resources to support mental health (4.04) ▪ Better addressing harassment and bullying in the workplace (3.89) ▪ Finding ways to keep people in the sector for longer (3.78)	▪ Finding ways to keep people in the sector for longer (4.15) ▪ Better addressing harassment and bullying in the workplace (4.08) ▪ Increasing access to resources to support mental health (4.05)
Top 3 lowest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Improving the profitability of the companies in the industry (3.09) ▪ Accelerating the adoption of new technology in the workplace (2.96) ▪ Addressing business succession issues (2.9)	▪ Addressing concerns related to camp costs (3.22) ▪ Accelerating the adoption of new technology in the workplace (3.2) ▪ Addressing business succession issues (3.2)

4.10 Summary By Demographic Characteristics

Age Groups – Under 25, 25 to 29, 30 to 44, 45 and Above

The Qualitative Data Summary By Age Group table, on the following page, summarizes the key qualitative indicators by agree group. Employees aged 45 and above were the most satisfied with their actual experience in the industry, reporting an average rating of 4.3, with 81% indicating that they are satisfied. Those employees under the age of 25 reported an average satisfaction rating of 4.26, with most respondents (85%) indicating that they are satisfied with their actual experience working in the industry, making them the age group with the second highest satisfaction level.

"Relationships with co-workers" was the most commonly indicated major positional advantage amongst employees 29 and younger, while "The wages" were indicated as a major advantage in three out of the four age groups. The most prevalent major positional disadvantage across all age groups was "The predictability of how much work will be available" with all but those aged 25 to 29 rating it in their top three.

In terms of employee satisfaction with their employer, this indicator appears to increase with age as each ascending age group provided a higher employer satisfaction rating, toping at 4.49 out of 5 in the 45 and above age group. Interest in career advancement remains relatively steady for those under the age of 45, and then decreases slightly for the 45 and above age group.

As employees age they are generally more likely to be "considering or definitely will be making this a career", reaching a maximum of 39% in the 30 to 44 age group. With regards to the usefulness of their education and training, those aged 45 and up provide the highest rating at 4.19 out of 5, with 73% of respondents indicating that they find their education and training useful in their position.

Employees were also asked about the level of prioritization that the industry should place on certain issues. The issues of "Increasing access to resources to support mental health", "Better addressing harassment and bullying in the workplace", and "Finding ways to keep people in the sector for longer" were the most commonly prioritized issues, with three out of the four age groups rating each of them in their top three.

Qualitative Data Summary By Age Group[60]

(Leading factors presented per indicator)

Qualitative Indicators	Under 25 Years	25 to 29 Years	30 to 44 Years	45 or Above
Employee Satisfaction Rating (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.26 (85% satisfied)	▪ 4.08 (76% satisfied)	▪ 3.96 (72% satisfied)	▪ 4.31 (81% satisfied))
Top 3 Major Advantages (% indicated a major advantage)	▪ The relationships with co-workers (69%) ▪ The wages (67%) ▪ The setting (56%)	▪ The relationships with co-workers (61%) ▪ My ability to do the work (59%) ▪ The wages (56%)	▪ My ability to do the work (50%) ▪ The relationships with co-workers (49%) ▪ The wages (45%)	▪ The sense of fulfilment from doing the work (52%) ▪ My ability to do the work (50%) ▪ The setting (42%)
Top 3 Major Disadvantages (% indicated a major disadvantage)	▪ The predictability of how much work will be available (10%) ▪ The physicality of the work (7%) ▪ The opportunities for advancement (6%)	▪ The opportunities for advancement (11%) ▪ The transient or mobile lifestyle (9%) ▪ The physicality of the work (7%) ▪	▪ The predictability of how much work will be available (13%) ▪ The opportunities for advancement (11%) ▪ The transient or mobile lifestyle (9%)	▪ The predictability of how much work will be available (14%) ▪ The seasonality of the work (11%) ▪ The transient or mobile lifestyle (5%) ▪
Satisfaction with employer (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 3.86 (69% satisfied)	▪ 4.04 (72% satisfied)	▪ 4.16 (77% satisfied)	▪ 4.49 (84% satisfied)
Interest in career advancement (On a scale of 1 to 5, where 1 is not at all interested, 3 is somewhat and 5 is very interested)	▪ 3.69 (59% interested)	▪ 3.38 (45% interested)	▪ 3.49 (51% interested)	▪ 3.02 (32% interested)
Longer-term outlook in the sector	▪ Considering or definitely will be making this a career (22%) ▪ For at least a few more years (38%)	▪ Considering or definitely will be making this a career (27%) ▪ For at least a few more years (35%)	▪ Considering or definitely will be making this a career (39%) ▪ For at least a few more years (32%)	▪ Considering or definitely will be making this a career (38%) ▪ For at least a few more years (41%)

[60] The number of respondents to each qualitative question can vary. Percentages and ratings were computed based on those who provided an answer to the question.

Qualitative Indicators	Under 25 Years	25 to 29 Years	30 to 44 Years	45 or Above
Usefulness of education and training (On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful)	▪ 3.68 (53% indicated useful)	▪ 3.82 (59% indicated useful)	▪ 3.77 (57% indicated useful)	▪ 4.19 (73% indicated useful)
Appropriateness of the COVID health and safety measures implemented by employers (On a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate)	▪ 4.12 (73% indicated appropriate)	▪ 4.15 (75% indicated appropriate)	▪ 4.28 (81% indicated appropriate)	▪ 4.54 (88% indicated appropriate)
COVID-19 impacts on the stress felt by employees in 2020 (On a scale of 1 to 5, where 1 was not at all, 3 is somewhat, and 5 is a great deal)	▪ 3.39 (46% indicated an impact)	▪ 3.51(48% indicated an impact)	▪ 3.58 (50% indicated an impact)	▪ 3.78(65% indicated an impact)
Top 3 highest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Increasing access to resources to support mental health (4.04) ▪ Better addressing harassment and bullying in the workplace (3.93) ▪ Improving health and safety measures (3.79)	▪ Increasing access to resources to support mental health (4.16) ▪ Better addressing harassment and bullying in the workplace (3.97) ▪ Finding ways to keep people in the sector for longer (3.92)	▪ Finding ways to keep people in the sector for longer (4.09) ▪ Increasing access to resources to support mental health (3.94) ▪ Better addressing harassment and bullying in the workplace (3.82)	▪ Finding ways to keep people in the sector for longer (4.28) ▪ Improving awareness and perception of the sector as a potential source of employment for youth (3.92) ▪ Improving the profitability of the companies in the industry (3.83)
Top 3 lowest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Accelerating the adoption of new technology in the workplace (3.02) ▪ Addressing business succession issues (2.9) ▪ Improving the profitability of the companies in the industry (2.84)	▪ Improving the profitability of the companies in the industry (2.84) ▪ Accelerating the adoption of new technology in the workplace (3.02) ▪ Addressing business succession issues (2.9)	▪ Accelerating the adoption of new technology in the workplace (3.23) ▪ Addressing business succession issues (3.18) ▪ Improving awareness and perception of the sector as a potential source of employment for youth (3.14)	▪ Accelerating the adoption of new technology in the workplace (3.35) ▪ Increasing the diversity of the work force (3.32) ▪ Addressing concerns related to camp costs (2.96)

Gender

Employees were asked about the top three major advantages of their position. Male respondents cited their ability to do the work (54%), the wages (53%) and their relationships with co-workers (52%) as the top advantages. In comparison, female respondents noted their relationships with co-workers (63%) as the top advantage, followed by the wages (55%) and the ability to do the work (51%), indicating that female employees place a higher value on relationships fostered with co-workers than their male counterparts. As for the top three disadvantages reported by employees, the response rates by both males and females were slightly different, with males citing the predictability of how much work will be available (11%) as the main disadvantage, followed by the transient or mobile lifestyle (8%) and the opportunities for advancement (8%). Female employees noted the main disadvantage as relating to opportunities for advancement (10%) followed by the predictability of how much work will be available (9%) and the transient or mobile lifestyle (7%).

When questioned on their longer-term outlook in the sector, 34% of male employees are considering or definitely will be making this a career in contrast to 29% of female employees. An equal percentage of male and female employees (35%) reported considering remaining in the position for at least a few more years. Relatedly, as indicated in the qualitative data summary table below, a significantly larger percentage of women (64%) felt that education and training were useful as opposed to just 53% for their male counterparts.

The Qualitative Data Summary By Selected Characteristics table, on the second following page, summarizes the key qualitative indicators by gender, minority group, and education enrollment. As indicated, male employees had an average response rate of 3.41 (44%) when asked about the impacts of COVID-19 on the stress felt by employees in 2020, on a scale of 1 to 5, where 1 was not at all, 3 is somewhat, and 5 is a great deal. In comparison, female employees felt a higher degree of impact, indicating an average response rate of 3.68 (56%).

Identified as Indigenous and/or Visible Minority

Indigenous workers felt that the top three major advantages of their position were the following: their ability to do the work (69%), the relationships with co-workers (58%) and the sense of fulfilment from doing the work (54%). In stark contrast, minority employees listed wages (58%) as the most advantageous, followed by their relationships with co-workers (20%) and their sense of fulfilment from doing the work (20%).

In terms of their satisfaction with their employer, employees identifying as visible minorities, provided an average response rate of 3.97 (73%) on a scale of 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied. Correspondingly, Indigenous workers reported an average response rate of 4.50 (83%) in terms of satisfaction with their employers. When asked about their interest in career advancement, 32% of indigenous respondents indicated they are considering or definitely will be making this a career as opposed to 27% of minority workers. Relatedly, 45% of Indigenous employees indicated they would remain in the workforce for at least a few more years, with only 35% of minority workers indicating the same.

When questioned about the top three highest rated issues in terms of priorities, minority workers indicated that finding ways to keep people in the sector for longer (4.19) and increasing access to resources to support mental health (4.19) were the highest priorities, followed by a need to better address harassment and bullying in the workplace (4.14). Indigenous workers reported that the top three highest rated priorities were finding ways to keep people in the sector for longer (4.44), followed by better addressing harassment and bullying in the workplace (4.13) and strengthening training and support provided to new employees and those already in the sector (4.04).

The top three lowest rated issues reported by minority workers were accelerating the adoption of new technology in the workplace (3.26), followed by improving the profitability of the companies in the industry (3.26) and addressing business succession issues (3.23). Correspondingly. Indigenous workers identified the following as the top three lowest rated issues: improving the profitability of the companies in the industry (3.45), accelerating the adoption of new technology in the workplace (3.21) and addressing business succession issues (3.0).

In School in 2020

Of the respondent's surveyed, those not enrolled in school are more likely to consider or definitely make this a career (36%) as opposed to only 22% of those enrolled at school. Of the employees enrolled at school, 38% indicated they would remain in the position for at least a few more years, whereas 34% of those not enrolled indicated the same.

Employees were asked about the top 3 highest rated issues in terms of priorities (based n a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority). Those not enrolled in school listed finding ways to keep people in the sector for longer (4.02) as the main priority, followed by increasing access to resources to support mental health (3.94) and better addressing harassment and bullying in the workplace (3.80). For those enrolled in school, the top priority is increasing access to resources to support mental health (4.12), followed by better addressing harassment and bullying in the workplace (4.02) and improving health and safety measures (3.83)

When questioned about the lowest rated issues in terms of priorities, those not enrolled in school listed the following: improving awareness and perception of the sector as a potential source of employment for youth (3.26), accelerating the adoption of new technology in the workplace (3.14) and addressing business succession issues (3.09) as the lowest priorities. Employees enrolled in school indicated the lowest priorities as accelerating the adoption of new technology in the workplace (3.17), addressing business succession issues (2.96) and improving the profitability of the companies in the industry (2.91).

Qualitative Data Summary By Selected Characteristics[61]

(Leading factors presented per indicator)

Qualitative Indicators	Gender		Identified as:		In School in 2020?	
	Female	Male	Indigenous	Visible Minority	Enrolled	Not Enrolled
Employee Satisfaction Rating (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.06 (76% satisfied)	▪ 4.14 (78% satisfied)	4.04 (67% satisfied)	▪ 3.95 (68% satisfied)	▪ 4.09 (79% satisfied)	▪ 4.11 (77% satisfied)
Top 3 Major Advantages (% indicated a major advantage)	▪ The relationships with co-workers (63%) ▪ The wages (55%) ▪ My ability to do the work (51%)	▪ My ability to do the work (54%) ▪ The wages (53%) ▪ The relationships with co-workers (52%)	▪ My ability to do the work (69%) ▪ The relationships with co-workers (58%) ▪ The sense of fulfilment from doing the work (54%)	▪ The wages (58%) ▪ The relationships with co-workers (20%) ▪ The sense of fulfilment from doing the work (20%)	▪ The wages (67%) ▪ The relationships with co-workers (64%) ▪ The setting (55%)	▪ My ability to do the work (53%) ▪ The relationships with co-workers (53%) ▪ The wages (47%)
Top 3 Major Disadvantages (% indicated a major disadvantage)	▪ The opportunities for advancement (10%) ▪ The predictability of how much work will be available (9%) ▪ The transient or mobile lifestyle (7%)	▪ The predictability of how much work will be available (11%) ▪ The transient or mobile lifestyle (8%) ▪ The opportunities for advancement (8%)	▪ The predictability of how much work will be available (23%) ▪ The seasonality of the work (12%) ▪ The opportunities for advancement (12%)	▪ The predictability of how much work will be available (15%) ▪ The opportunities for advancement (13%) ▪ The transient or mobile lifestyle (8%)	▪ The opportunities for advancement (10%) ▪ The predictability of how much work will be available (9%) ▪ The physicality of the work (7%)	▪ The predictability of how much work will be available (10%) ▪ The opportunities for advancement (8%) ▪ The transient or mobile lifestyle (7%)
Satisfaction with employer (On a scale 1 to 5, where 1 is not at all satisfied, 3 is somewhat, 5 is very satisfied)	▪ 4.00 (72% satisfied)	▪ 4.15 (76% satisfied)	4.50 (83% satisfied)	▪ 3.97 (73% satisfied)	▪ 3.92 (70% satisfied)	▪ 4.15 (76% satisfied)
Interest in career advancement (On a scale of 1 to 5, where 1 is not at all interested, 3 is	▪ 3.49 (51% feel interested)	▪ 3.46 (48% feel interested)	3.58 (54% feel interested)	▪ 3.47 (41% feel interested)	▪ 3.40 (49% feel interested)	▪ 3.49 (50% feel interested)

[61] The number of respondents to each qualitative question can vary. Percentages and ratings were computed based on those who provided an answer to the question.

Qualitative Indicators	Gender		Identified as:		In School in 2020?	
	Female	Male	Indigenous	Visible Minority	Enrolled	Not Enrolled
somewhat and 5 is very interested)						
Longer-term outlook in the sector	▪ Considering or definitely will be making this a career (29%) ▪ For at least a few more years (35%)	▪ Considering or definitely will be making this a career (34%) ▪ For at least a few more years (35%)	▪ Considering or definitely will be making this a career (32%) ▪ For at least a few more years (45%)	▪ Considering or definitely will be making this a career (27%) ▪ For at least a few more years (35%)	▪ Considering or definitely will be making this a career (22%) ▪ For at least a few more years (38%)	▪ Considering or definitely will be making this a career (36%) ▪ For at least a few more years (34%)
Usefulness of education and training (On a scale of 1 to 5, where 1 is not at all useful, 3 is somewhat, and 5 is very useful)	▪ 3.97 (64% indicated useful)	▪ 3.65 (53% indicated useful)	4.25 (71% indicated useful)	▪ 4.00 (65% indicated useful)	▪ 3.82 (60% indicated useful)	▪ 3.80 (58% indicated useful)
Appropriateness of the COVID health and safety measures implemented by employers (On a scale of 1 to 5, where 1 was not at all appropriate, 3 was somewhat, and 5 was very appropriate)	▪ 4.30 (79% indicated appropriate)	▪ 4.19 (77% indicated appropriate)	4.36 (80% indicated appropriate)	▪ 4.16 (81% indicated appropriate)	▪ 3.14 (77% indicated appropriate)	▪ 4.27 (78% indicated appropriate)
COVID-19 impacts on the stress felt by employees in 2020 (On a scale of 1 to 5, where 1 was not at all, 3 is somewhat, and 5 is a great deal)	▪ 3.68 (56% indicated an impact)	▪ 3.41 (44% indicated an impact)	▪ 3.72 (56% indicated an impact)	▪ 3.68 (57% indicated an impact)	▪ 3.44 (48% indicated an impact)	▪ 3.57 (51% indicated an impact)
Top 3 highest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Increasing access to resources to support mental health (4.32) ▪ Better addressing harassment and bullying in the workplace (4.28)	▪ Finding ways to keep people in the sector for longer (3.89) ▪ Increasing access to resources to support mental health (3.73) ▪ Strengthening training and	▪ Finding ways to keep people in the sector for longer (4.44) ▪ Better addressing harassment and bullying in the workplace (4.13) ▪ Strengthening training and	▪ Finding ways to keep people in the sector for longer (4.19) ▪ Increasing access to resources to support mental health (4.19) ▪ Better addressing harassment and	▪ Increasing access to resources to support mental health (4.12) ▪ Better addressing harassment and bullying in the workplace (4.02) ▪ Improving health and safety measures (3.83)	▪ Finding ways to keep people in the sector for longer (4.02) ▪ Increasing access to resources to support mental health (3.94) ▪ Better addressing harassment and bullying in the workplace (3.80)

Qualitative Indicators	Gender		Identified as:		In School in 2020?	
	Female	Male	Indigenous	Visible Minority	Enrolled	Not Enrolled
	▪ Finding ways to keep people in the sector for longer (3.99)	support provided to new employees and those already in the sector (3.69)	support provided to new employees and those already in the sector (4.04)	bullying in the workplace (4.14)		
Top 3 lowest rated issues in terms of priorities (On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority, and 5 is a major priority)	▪ Accelerating the adoption of new technology in the workplace (3.14) ▪ Improving the profitability of the companies in the industry (3.09) ▪ Addressing business succession issues (2.99)	▪ Increasing the diversity of the work force (3.19) ▪ Accelerating the adoption of new technology in the workplace (3.17) ▪ Addressing business succession issues (3.11)	▪ Improving the profitability of the companies in the industry (3.45) ▪ Accelerating the adoption of new technology in the workplace (3.21) ▪ Addressing business succession issues (3.0)	▪ Accelerating the adoption of new technology in the workplace (3.26) ▪ Improving the profitability of the companies in the industry (3.26) ▪ Addressing business succession issues (3.23)	▪ Accelerating the adoption of new technology in the workplace (3.17) ▪ Addressing business succession issues (2.96) ▪ Improving the profitability of the companies in the industry (2.91)	▪ Improving awareness and perception of the sector as a potential source of employment for youth (3.26) ▪ Accelerating the adoption of new technology in the workplace (3.14) ▪ Addressing business succession issues (3.09)

5. MAJOR FINDINGS REGARDING RESEARCH QUESTIONS

This chapter draws from the findings of the employer and employee surveys, literature review and key informant interviews to address each of the research questions which were outlined in Chapter 1.

Question 1: What is the current size, composition and characteristics of the labour market and workforce for BC's silviculture sectors, including silviculture nurseries, tree planting, wildfire fighting, stand management (brush and spacing), and consulting foresters?

We estimate that 228 silviculture employers were active in BC in 2020.

In developing an estimate of the total number of employees, we first compiled and refined a population list of employers in the sector. The population list drew from a variety of sources such as lists of WFCA members and non-members, employers surveyed as part of similar research in 2013 and 2014, an internet search, referrals from members of the Steering Committee, and a Freedom of Information Request to WorkSafeBC. Additions and deletions were made based on feedback and input received during the course of the study. The initial lists contained 368 employers. After attempting to contact each employer, we excluded 140 employers who could not be contacted (e.g., telephone not in service), indicated the business is no longer active, have no employees, or indicated that they are not part of the silviculture industry, leaving a final population of 228 employers.

A majority of the employers who were surveyed indicated that they have FTE employees active in more than one sector (e.g., tree planting, forestry consulting, and brushing & spacing). The response rate to the survey tended to higher amongst larger employers. Large employers tend to have been in operation for a longer period of time and be located in more communities (e.g., multiple offices). Most of the employers (66%) surveyed have been in operation in BC for more than 20 years. About 5% of the employers also reported one or more offices outside of BC.

These 228 silviculture organizations active in BC employed an estimated 3,934 people on an FTE basis in 2020 with peak employment reaching 10,152.

This projection <u>excludes</u> BC Wildfire Services which employs 1,600 seasonal personnel each year, including firefighters, dispatchers and other seasonal positions.[62] For the purpose of projecting employment, the population list was divided into three categories:

- 77 employers who reported their level of employment in the survey. In total, the 77 companies reported 2,285 FTE positions in BC and peak employment of 6,720 employees in 2020.
- 34 employers who did not respond to the survey but for which we were able to obtain 2020

[62] https://www2.gov.bc.ca/gov/content/safety/wildfire-status/employment-and-contracts

payroll data through a Freedom of Information Request with WorkSafeBC. WorkSafeBC provided us with payroll data on medium and larger employers (i.e., payroll of $400,000 or more) but suppressed the data for smaller employers. Amongst the 42 companies that were surveyed for which we obtained payroll data, the average payroll (from WorkSafeBC) per employee (as reported in the survey) was equal to $57,764. To estimate the number of FTEs employed by organizations for which we had payroll data but were not surveyed, we divided the total payroll reported by them to WorkSafeBC by $57,764.

- 117 small employers (i.e., with suppressed payrolls of less than $400,000) for which WorkSafeBC did not provide payroll data. For these employers, we assumed there were an average of 5.1 FTE employees per organization, which is equal to the average number of employees per organization which were surveyed that reported payroll of less than $400,000 in 2020.

The peak employment for the second and third categories was then projected based on the ratio between peak employment and FTEs reported by the employers which were surveyed. To do that, we first grouped the 228 employers by sector using WorkSafe BC classifications. We then determined the ratio between the peak employment and FTEs reported by the employers surveyed from each of those classifications. The ratio between peak employment and FTEs varied from 3.3 and 3.2 peak employees for every FTE in the tree planting and brushing and spacing sectors respectively to 2 in the wildfire fighting sector, 1.9 in nursery sector and 1.2 in the consulting sector.

As indicated in the table below, the employers who were surveyed and provided employment and financial data accounted for 34% of the 228 companies, 64% of the projected FTE employment and 66% of the projected peak employment in the industry. Most of the projected FTE employment (about 85%) was confirmed through either the survey and/or the WorkSafeBC data.

Projected FTEs and Peak Employment in the BC Silviculture Industry

Categories	Employers	%	FTEs	%	Peak	%
Data Reported By Employers in the Survey						
Surveyed Employers	77	34%	2,515	64%	6,720	66%
Estimates for Employers That Did Not Participate						
Based on WorkSafeBC Figures	34	15%	823	21%	1,794	18%
Projected Employment	117	51%	597	15%	1,638	16%
Sub-total	151	66%	1,420	36%	3,432	34%
Projected Total	**228**	**100%**	**3,935**	**100%**	**10,152**	**100%**

Tree planting is the largest segment within the BC silviculture industry.

It is difficult to estimate employment by sector because almost three-quarters (72%) of the employers reported that they have FTE employees active in more than one sector. For example, those involved in wildfire fighting are often also involved in brushing & spacing or forestry consulting. Those involved in brushing & spacing are commonly also involved in tree planting.

There are two different options for estimating employment by sector, both of which have limitations. Fortunately, the two options provide very similar results.

- The first option is to use the survey results and assume that is representative of all employers in the industry. We asked the employers who were surveyed to provide a breakdown of their FTEs by sector. As noted in Chapter 3, the employers reported that 47% of FTEs related to tree planting operations, 19% to forestry consulting and 17% to nursery operations. By operations, we mean all people employed in related activities (for tree planting, for example, that would include planters, other field staff, supervisors, management and support staff related to their planting operations). The challenge in using this data is that some sectors may have been under-represented in the survey results (e.g., wildfire fighting and brushing & spacing).

- The second is to use WorkSafeBC classifications for the 228 employers. The challenge here is that most employers are active in more than one sector while our classifications focus on one sector. Using this option, employers classified as tree planting accounted for 46% of the FTEs (as compared to 47% under Option 1), forestry consulting accounted for 20% to (as compared to 19% under Option 1) and to nursery operations accounted for 17% (the same as Option 1).

WorkSafeBC Classification	Employers	%	FTEs	%	Peak	%
Tree Planting	59	26%	1,803	46%	6,009	59%
Forestry Nurseries	23	10%	688	17%	1,320	13%
Consulting	40	18%	796	20%	967	10%
Brushing and Spacing	36	16%	242	6%	779	8%
Wildfire Fighting	55	24%	331	8%	658	6%
Other	15	7%	74	2%	420	4%
Projected Total	**228**	**100%**	**3,935**	**100%**	**10,152**	**100%**

We estimate that the 228 silviculture organizations active in BC generated about $550 million in revenues in 2020 and paid $291 million in wages.

The financial data reported by the surveyed employers was extrapolated based on the number of FTEs. As indicated below, 90% of the revenues are generated from silviculture related operations. Reported wage costs totaled 53% of revenues, expenditures on education and training totaled nearly 3% and expenditures on other goods and services totaled 21% of revenues.

Economic Data Reported By Employers

Production Data Reported by Employers	Data Reported by Employers		
	Surveyed Employers	As % of Revenues	Estimated Total
Employers	77	--	228
FTEs	2,515	--	3,935
Financial Data			
Revenues ($ millions)	$352.0	100%	$550.7
Silviculture Revenues	$317.5	90%	$496.8
Wages	$185.7	53%	$290.6
Training and Education	$9.7	3%	$15.2
Other Goods and Services	$73.6	21%	$115.2

The BC silviculture industry consists of a highly diverse group of companies, which is reflected in a wide range of occupations within the industry.

The most common position identified by the employers surveyed was tree planter.

Peak Seasonal Employment in 2020 by Position

Position	Employees	
	#	%
Tree Planter	3,723	55.4%
Silviculture Nursery Worker	862	12.8%
Crew leader	422	6.3%
Forestry Consultant	416	6.2%
Spacer or Brusher	352	5.2%
Wildfire Fighter	184	2.7%
Supervisor or Project Manager	162	2.4%
Cook	157	2.3%
Other field staff	138	2.1%
Administration staff	118	1.8%
Senior managers	103	1.5%
Other	83	1.3%
Total	**6,719**	**100.0%**

Field staff commonly fulfill a number of roles, with 63% of the employees surveyed reporting that they work part of their time in one position and part in one or more other positions. The silviculture industry is different from many other industries in that many of the occupations (e.g., tree planter) are specific to this industry rather than shared with other economic sectors.

A majority of employees in the industry are male and nearly 90% are employed seasonally.

Of the peak staff, only 10.5% are employed year-round. The percentage of employees who work year-round varies across different positions from all senior managers, two-thirds of administrative staff (65%) and half of the supervisors or project managers (50%) to very few wildfire fighters (11%) or tree planters (2%).

Seasonal employees who were surveyed indicated that they worked an average of 17.6 weeks in the silviculture industry in 2020, with 55% of the employees working 15 weeks or less. Of those employees working in 2020, 49% indicated that they would have worked more weeks in 2020 if the work had been available. Over half of the current employees who were surveyed have worked in the industry for more than five years and most have worked for multiple employers.

According to the employers surveyed, 34% of their peak employees in 2020 were women, 5% were Indigenous, and 2% were Temporary Foreign Workers. In terms of professional designations, 2% of the workers were Registered Professional Foresters and 2% were Registered Forest Technologists. Of the seasonal workers employed in BC, 35% reside outside of the province during the off-season. One-third of the employees surveyed were based outside of BC for at least part of the year while working in the silviculture industry (most commonly in Alberta).

Question 2: What are the major drivers of workforce demand for BC's silviculture sectors, including nurseries, tree planting, wildfire fighting, brushing and spacing, and consulting foresters over the next five to 10 years? What is the outlook for the sectors?

Employment in the BC silviculture industry is growing primarily as a result of growth in existing employers.

The employers that have been operating for five years or more were asked to report the number of FTEs workers they employed in BC five years ago and all employers were asked about the number they expect to employ in five years. On an aggregate basis, employers reported that the number of FTEs has increased by 18.1% over the past five years (an average of 3.4%) and is expected to increase by 16.5% over the next five years (an average of 3.1%).

The recent growth of 18% is directly consistent with the change in the level of employment in the industry in 2014 and in 2020. At the time of the 2014 survey, industry employment was estimated at 6,676 including tree planting (4,361), wildfire fighting (667, not including the 1100 employed by the BC Wildfire Service), brushing & spacing (1,466) and office and administration (172). Forestry nurseries and consultants were not included in the analysis at that time. Excluding those two sectors, the peak employment in 2020 was 7,866 employees which represents an 18% increase over 2014.

The employers most commonly attributed their growth to changes in overall industry revenues (identified by 81% of employers), the market share held by their company (57%), the range of products or services they provide (47%), the scope of their operations (e.g., more locations – 36%), and productivity (19%).

Recent and projected growth in employment varies by sector.

- Employers in the *planting, brushing and spacing sectors* indicated that employment grew by an average of 3.4% over the past five years and projected revenues would grow by 2.2% over the next five years. The growth has resulted from increased investments in reforestation in response to record breaking fire seasons, the impact of the Mountain Pine Beetle, and climate change. Somewhat slower rates of growth going forward reflect expected slowing in the demand for tree planting. Although the projected planting levels are forecasted to drop over the next five years, relative to 2020, the projected level of seedlings planted remains higher than in the previous 4 years (2016-19).

- Employers in the *forest nursery sector* indicated that employment grew by an average of 4.4% over the past five years and projected revenues would grow by 2.7% over the next five years. Employment in the forestry nurseries sector is directly related to the number of seedlings planted.

- Employers in the *wildfire fighting sector* indicated that employment declined by an average of 4.3% over the past five years and projected revenues would grow by 9.5% over the next five years. Employment in wildfire fighting can vary widely by year depending on the level of fire activity. The year 2020 experienced a low level of fire activity (i.e. the employers who were surveyed reported employing only 145 wildfire fighters in 2020, as compared to 369 in 2018). As such, 2020 represents a low base from which to grow. Over time, it is anticipated demand will increase as global warming contributes to increase risk of forest fires. However, growth may be moderated by growth in the size of the BC Wildfire Service (which has increased from 1,100 seasonal staff in 2014 to 1,600 in 2021).

- Employers in the *forestry consulting sector* indicated that employment grew by an average of 2.9% over the past five years and projected revenues would grow by 8.0% over the next five years. The employers attributed the outlook for growth to increasing demand for services (as forests become more actively managed), a broadening of the range of products and services they offer and increased market share.

Key informants generally view the economic outlook for the silviculture industry as positive over the next five to ten years.

Over 70% of the key informants are positive about the economic outlook of the sector, attributing future growth to factors such as increasing public awareness of climate change and continuing government support for reforestation. However, they also expressed considerable uncertainty regarding the longer-term outlook, given difficulties in predicting changes in government policies, rising government debt, the impact of climate change, and overall economic conditions. Future demand will be impacted by changing policies around forest management and by increased involvement of First Nations communities in the industry.

A few key informants opined that the level of economic activity overall will largely be unchanged, although some sectors are likely to fare worse than others. In particular, some expressed concern about the wildfire fighting sector, largely due to unpredictability of the fire seasons, government's approach toward contracting, and the limited options for contractors and workers in low fire seasons (particularly for Type 3 contractors)

Question 3: What are the key labour market and employment, social, environmental and economic trends affecting the silviculture industry?

Recognition of the importance of forests in fighting climate change as well as the importance of effective forest management for ecosystem health is creating new opportunities for silviculture industry.

The critical role of forests in maintaining ecosystem health and climate stability led to reforestation objectives reaching the top of the global climate change agenda. In Canada, reforestation has become one of the important strategies towards achieving its climate goals. Provincial demand for seedlings is projected to remain high over the next five years, compared to previous 4 years. The shift in government approach on forest management towards managing for ecosystem health and protecting old-growth forests by cultivating faster-growing trees, increased fertilization, improved fire risk management, a shorter growth-to-harvest cycle, and increases in the planting and harvesting of deciduous hardwoods, will potentially increase opportunities for silviculture workers.

An important priority for silviculture workers surveyed were issues related to environmental protection, including building sustainability of silviculture industry around environmental protection, fighting climate change, protecting old-growth forest, protecting biodiversity, etc. Increasing recognition of the vital connection between forests and the environment is an important competitive advantage for the industry in attracting new employees who seek purposeful work.

Managing wildfire and other forest disturbances is going to remain a priority for governments.

Extreme weather conditions, including increasingly hotter summers, are expected to require better preparedness with respect to wildfire management. In 2020, BC's forest firefighting budget was $136 million compared to $101 million in 2019 and $63 million in 2018 (with some extra precautions for COVID-19). New initiatives are being funded to investigate opportunities to de-escalate future forest fires while strengthening development of a forest-based bioeconomy in BC. For example, a $1 million investment was announced in January 2020 for the project called "Wildfire and Carbon" that will investigate most effective strategies to reduce risks of fire in the forests through thinning, removing of fallen needles and dead brunches that commonly lead to intense and destructive fires, and potentially using some of the material and biomass removed from the forest and turning it into biofuel.

Key informants noted that prescribed burning, brushing and spacing, may become more of a priority providing an opportunity for forest firefighters to engage in other silviculture activities. Prescribed burning may also be an opportunity to engage Indigenous communities as this has been traditionally used as a strategy for forest management.

Stagnating contract prices impact both the profitability of the industry and the wages.

Forty percent of employers identified improving the profitability of companies in the industry as a major priority. They noted a need to increase payment rates to ensure those rates keep pace with inflation (some expressed concern that a concentration of market power on the buyer side is driving down prices, which can lead to lowering of quality and labour standards).

There is also a recognized need to revisit the structure of contracts. This was particularly important for the wildfire contractors who are expected to invest in order to meet BCWFS training standards, with no guarantee of work. In response to uncertainty regarding demand, particularly after two seasons with low levels of first activity, many contractors are moving to other lines of work, raising concerns about whether firefighting capacity will be there when needed. Employers also reported a need to create greater stability in the sector through making other changes in contracting (e.g., moving to multi-year contracts, prioritizing local bidders, etc.).

Almost half of employees also reported a need to increase tree pricing so that employers can raise wages, keep-up with inflation and the rising cost of living, pay for sick days and medical benefits, and make it easier for workers to make money given the seasonality and physicality of work. The earnings, particularly in the tree-planting sub-sector, range widely (e.g., higher earning planters may be making between $300 to $400 a day while rookies typically make about a $150 a day). Some employees surveyed noted that there is unhealthy competition amongst workers, and those who do not perform as well not only struggle to make good earnings, but also feel pressure to perform which can impact their mental and physical health.

Some key informants noted that the new generation of workers are likely to be driven to the sector more by the potential for earnings than by escapism and environmentalism. They suggested that wages are and will continue to be a main driver for workers. If employers are unable to meet the expectations with respect to earnings, it will reduce the pool of workers available.

Seasonality and the unpredictability of work constrains industry's ability to retain and develop a skilled labour force.

Next to profitability, the next highest priority identified by employers was the need to find ways to keep people in the sector longer. Seasonality and nature of work in some sub-sectors results in the high turnover rates. While employers recognize that some level of turnover is necessary given the hard physical labour that is required, there is a need to develop strategies to increase the average number of years people stay in the industry. Employers highlighted the need to find ways to develop leaders (senior managers) and provide greater career options for the workers in the industry.

About 20% of employees highlighted the need to develop options to increase employment opportunities which extend beyond the short seasons, provide incentives to recognize the seasonality of work, guarantee minimum hours of work, and create more permanent positions.

Employers in consulting and forestry nurseries sub-sector were more likely to report a need to increase awareness of the sector as a potential source of employment for youth and strengthen the education and training programs focused on forestry.

Question 4: What has been the impact of COVID-19 on the silviculture industry?

Designated an essential service, the silviculture industry experienced a successful 2020 season featuring a record number of trees planted and no COVID-19 infections.

Forestry and silviculture services were included in a March 26, 2020 list of essential services. Operations were allowed to continue providing that all infection prevention control plans and protocols were followed. New training needed to be developed quickly and implemented. Many adjustments had to be made to operating procedures, practices and standards in areas such as accommodation, meals, and hygiene measures. Workflows and schedules were reorganized, travel outside of camp was limited, and new positions were created (e.g., infection control coordinators).

Key informants reported that, apart from a very few instances, contractors and workers committed to working together to make the necessary changes, maintain strong communications, and emphasize health and safety. Some noted the support from WFCA was crucial in supporting the contractors and working closely with government to ensure a successful season.

Most employees felt that their employers had implemented appropriate health and safety measures in response to the pandemic, providing an average rating of 4.2 on a 5 point scale, where 5 is very appropriate.

In 2020, COVID-19 had a major impact in terms of requiring employers to implement measures related to health and safety and increasing the costs of field operations.

Of the employers surveyed, 90% reported that COVID-19 increased the costs associated with their field operations (54% reported a significant impact and additional 36% reported some impact on the costs). Some key informants and employers estimated that costs for employers in tree-planting sub-sector may have increased by 20% to 30%.

The costs were associated largely with measures related to health and safety. About half of employers created new positions in response to COVID-19. While employers in all sub-sectors created new positions, those in tree-planting, bruising and spacing were those most likely to report creating new positions. Examples include COVID-19 coordinator, additional cooks, kitchen support, town runners, general staff and personnel. About one-third of these employers expect that some of these positions will remain once the pandemic is over. Over half of employers (53%) also reported that a decrease in labour productivity as a result of the pandemic.

The impact on employees was mixed. Some welcomed the new health measures and flexibility, as well as the opportunities to be out in the field. However, many field workers also reported increased stress, isolation, concerns about losing wages due to getting sick or having to quarantine, and mental health concerns.

Employees reported that workers experienced increased stress as a result of COVID-19 (providing an average rating of 3.5 on a 5-point scale). Similarly, 85% of employers reported that the stress felt by employees increased somewhat or significantly. Being in a remote environment and socially isolating impacted on mental health. Some workers were worried about getting sick and not making expected earnings.

Although most employees expressed no concerns about the new 2021 season at the time of the survey, some worried about health measures and protocols in light of the successful 2020 season, COVID fatigue and complacency. The main worries were the season getting shorter because of infections spreading, concerns about protections for rural and Indigenous communities, and general issues around mental health due to restrictions.

Both employees and employers felt that aspects of COVID-19 have created a positive legacy in terms of contributing to lasting improvements in health and safety and opening up new opportunities for remote work.

Key informants also reported significant improvements which are likely to continue in areas such as health and safety measures, hygiene in the camps, employment standards, training, adaptability, digitalization, and improved communication systems.

Question 5: What, if any, issues (e.g., awareness, nature of the work, work and workplace issues, income) are constraining the ability of the industry to recruit and retain workers in BC? What recruitment and retention strategies are being used effectively by employers and in the sector to recruit, develop and retain workers?

The industry depends on its ability to attract a steady stream of new employees, particularly for its field positions.

Of field workers employed in 2020, 61% were seasonal workers who returned from 2019 (i.e., to work for the same employer), 7% were not returning from 2019 but had worked previously for the organization, 11% were new to the organization but had previous experience in the industry, and 21% were new to both the industry and the organization.

Approximately two-thirds of the employees were expecting to return to the same employers in 2021, while 21% expected to continue to work in the sector but for a different employer and 6% did not expect to work in the sector in 2021.

Most employees are satisfied in their experience in working with their employers in 2020 and their experience in working in the industry overall.

On average, current employees rated their satisfaction in working with their most recent employer as a 4.0 on a scale of 1 to 5, where 1 is not at all satisfied and 5 is very satisfied in this sector for whom they worked in 2020. In a similar question, both current and former employees were satisfied with their experiences in working in the sector (current employers rated their satisfaction as a 4.1 and former employers rated it as 3.7).

Most employers were rated highly in terms of the tolerance for individuality, concern for the safety of employees, and maintaining a respectful workplace free from harassment and bullying. The areas of most common concern to employees related to camp costs, environmental stewardship, and the lack of support in assisting workers prepare for the season (e.g., support related to fitness preparation, training, equipment, etc.).

Relative to what other sectors they might be working in, employees saw the relationships with co-workers, the wages, their ability to do the work, and the setting as the major advantages of working in the industry. The most commonly identified disadvantages included the working conditions, the predictability of how much work will be available, the transient or mobile lifestyle, the seasonality of the work, the physicality of the work, and the opportunities for advancement.

According to the employees, the primary reasons why employees change employers is a desire to find better pay and better working conditions as well as just being ready for a change. When asked about how the individual employers can compete for workers with others in the industry, employers suggested focusing on safety in the work site, offering a positive work environment, emphasizing fairness in treatment of employees, offering an inclusive and welcoming environment for workers, creating opportunities to earn income (e.g., extending the season), and providing better compensation, equipment and work conditions, and opportunities for advancement and training. Employers also recommended maintaining communication during the off-season.

The primary reasons why employees left or are planning to leave the industry were the desire to find better opportunities for career advancement and less physically demanding work. According to employers, the most common reasons for leaving the sector are the nature of the work (e.g., physicality), the seasonal nature of the work, economic considerations (opportunities to earn greater income elsewhere), opportunities in other sectors and working conditions. When asked about how the industry can lengthen the time that employees stay in the industry, employers most commonly recommended providing more work opportunities (e.g., extend the season, provide off-season work, provide guaranteed work, increase job security) and additional financial incentives (e.g., increase wages, benefits, pension). Other suggestions were to improve working conditions (e.g., provide more training/education opportunities, provide comfortable camp life, focus on a safe and inclusive work environment), better promoting the industry as an attractive opportunity for young people (e.g., targeted advertisement, PR campaign, create partnerships between sectors to create year-round jobs), and placing a higher priority on hiring locally.

Key informants noted that the ability of the industry to attract and retain workers will depend in large part on the industry's ability to pay highly competitive wages (e.g., if workers can make a similar amount of money doing something less physically demanding it will be much more difficult to recruit) and to attract workers into the industry. Some key informants predicted that length of employment may decline over time (it may become harder to retain employees for more than a few years, noting burnout is an increasing issue and younger workers tend to have higher expectations, demand higher wages for less productivity). Productivity is likely to be only marginally impacted by new technology and may reduce over time, if there is a shift to working in more difficult terrains.

According to the employers surveyed, turnover rates amongst permanent staff have averaged about 11%.

According to employers, the most common reasons why permanent employees leave their position are being ready for a change and the opportunities for career advancement, better pay and steadier work. When asked what strategy they and other employers can use to slow the turnover of permanent staff, employers most commonly identified increasing compensation, providing a more flexible and enjoyable work environment, and providing career development opportunities like promotions, training and education.

Employers use a variety of strategies to create awareness of employment opportunities, of which recruiting through existing employees is most common.

Common strategies or actions taken by employers to create awareness of their employment opportunities included recruiting though existing employees (identified by 75% of employers), friends or acquaintances (55%), utilizing social media (55%), and posting job ads on company websites (54%). Most current and former employees reported that they first became aware of opportunities for them to work in silviculture from friends and acquaintances (62%) or others already in the sector (44%).

Employers and employees identified a variety of other issues that are impacting the industry.

The table below summarizes the rating provided by employers and employees regarding the priorities that should be placed on various industry issues.

Employer and Employee Perceptions Regarding Priorities That Should Be Placed On Various Industry Issues

(On a scale of 1 to 5, where 1 is not at all a priority, 3 is somewhat of a priority and 5 is a major priority, how much of a priority do you think should the sector place on the following issues?)

Potential Issues	Employers		Employees	
	Avg Rating	% Major Priority	Avg Rating	% Major Priority
Improving the profitability of the companies in the industry	3.94	41%	3.22	22%
Finding ways to keep people in the sector for longer (e.g., increasing employment opportunities/providing opportunities for career advancement/better retention strategies)	3.91	34%	3.92	40%
Improving awareness and perceptions of the sector as a potential source of employment for youth	3.78	33%	3.23	19%
Strengthening training and support provided to new employees and those already in the sector	3.67	23%	3.75	27%
Strengthening education and training programs focused on forestry	3.63	22%	3.50	21%
Improving health and safety measures	3.61	20%	3.73	31%

Potential Issues	Employers		Employees	
	Avg Rating	% Major Priority	Avg Rating	% Major Priority
Increasing access to resources to support mental health	3.48	19%	3.96	42%
Better preparing new and returning seasonal workers for the start of the season (e.g., equipment, fitness level, safety awareness, skills training)	3.44	16%	3.39	20%
Improving living conditions in camps (e.g., facilities, food, etc.)/addressing concerns related to camp costs	3.39	20%	3.48	32%
Better addressing harassment and bullying in the workplace	3.39	26%	3.88	44%
Improving adherence to employment standards/addressing gaps in existing policies and structures	3.22	9%	3.67	29%
Addressing business succession issues	3.21	17%	3.02	13%
Accelerating the adoption of new technology in the workplace	3.17	11%	3.12	15%
Increasing the diversity of the work force (e.g., increasing participation of women, Indigenous, ethnic minorities, recent immigrants, etc.)	3.16	13%	3.54	32%

Apart from those issues discussed previously in this chapter, some of the key issues identified by employees and employers included:

- *Increasing access to resources for mental health and addiction support*, including coverage through extended health and services related to drug/alcohol abuse.

- *Better addressing harassment and bullying in the workplace*. Employees highlighted the need to address issues related to workplace harassment, bullying and sexual harassment and provide for more effective investigation and discipline of workers accused of harassment.

- *Improving adherence to employment standards and addressing gaps in existing policies and structures*. Examples included ensuring that necessary safety measures (e.g., danger tree assessments and hazard tree management) are always conducted, all operations meet prevailing labour standards, and workplace and camp inspections are carried out by WorkSafe BC.

- *Improving health and safety measures*. Suggestions ranged from harm reduction strategies to increased access to safety equipment, improved hygiene and sanitary conditions, increased training related to risks and the prevention of injuries and building a culture of safety.

- *Increasing the diversity of the work force.* Suggestions were to increase the emphasis placed on promoting greater gender balance in management, encourage greater diversity among both contractors and staff, and provide access to employment opportunities to a broader community (e.g., Indigenous people, people of colour, immigrants, and women). Key informants noted several barriers in engaging with Indigenous communities and recruiting Indigenous workers including:

- Low awareness of the opportunities available, particularly in smaller communities where there is no family history of working in the industry.
- The remoteness of some communities can create barriers related to travel.
- The potential pool of workers is considered small and difficult to reach.
- There is a lack of accessible programs that provide skills, certifications, and training desired by the industry.
- There is potential for Indigenous development corporations to set up contracting businesses, but guidance, training and financial resources will be required to accelerate this process.
- There is a perception that prescribed burning is more aligned with Indigenous culture/traditions than tree planting (planting trees in order to harvest may not align with their culture).
- Most contractors have well-established processed for recruiting seasonal staff and have no history in targeted Indigenous communities and Indigenous workers processes.

- *Improving living conditions in camps.* Opportunities for improvement suggested by employees included improving communications infrastructure (e.g. access to wifi), kitchens, accommodation, showers, and access to water while reducing camp costs.

- *Improving awareness and perceptions of the sector as a potential source of employment for youth.* Employers and employees suggested increasing awareness of the industry and the many employment and business opportunities that are available, promoting the appeal of the industry to younger workers (e.g., better demonstrate how it aligns with their lifestyle expectations and promote the desirability of physical labour), and creating greater public awareness of the economic and environmental benefits of a strong working forest. Another suggestion was to implement programs to attract local workers, including Indigenous workers, located in nearby communities.

Issues related to training and support are discussed in Question #7.

Question 6: Are there current and projected shortages for silviculture workers in BC? If so, in what sectors and types of positions (i.e., roles and responsibilities) are the shortages projected to be most acute?

COVID-19 may have made it easier for employers to attract workers for the 2021 season.

At the time of the survey, most employers had not experienced (or did not anticipate experiencing) significant difficulties in filling its positions for 2021. On a scale of 1 to 5, where 1 is not at all difficult and 5 is very difficult, employers provided an average rating of 2.7 in terms of how difficult they anticipate it will be to recruit qualified candidates. This year, 2021, is an anomaly in that many industries faced significant uncertainty regarding how their demand for employment would materialize as Canada emerges from the pandemic. Certain sectors such as accommodation, tourism and the food and beverage sector, which are major employers for youth, were those most impacted by the pandemic. The uncertain outlook for these other sectors likely increased the appeal of the silviculture sector to youth in 2021.

Employers in in forestry consulting and nursery sectors were those most likely to identify difficulties in attracting workers for the 2021 season.

On a scale of 1 to 5, where 1 is not at all difficult and 5 is very difficult, employers provided an average rating that varied from 2.2 amongst employers in the planting, brushing and spacing sector, to 3.2 for employers in the forestry nursery sector, 3.3 amongst forestry consulting firms, and 4.0 amongst employers involved in wildlife fighting.

Employers identified a wide range of positions which will be difficult to fill and a variety of reasons why those positions will be difficult to fill. Wildfire fighting contractors identified the need for both experienced and certified firefighters as well as entry level staff. Forestry consultants noted difficulties in attracting experienced RFTs and RPFs as well as field engineers, project managers and field staff working towards professional certifications. Nurseries identified a mixture of recent college and university graduates in forestry and horticulture, seasonal leadhands and machine operators, and both new and experienced nursery workers and labourers. When asked about the reasons these positions are difficult to fill, the employers most commonly identified few applicants with the desired experience or skills sets and strong competition for these workers from other employers in the sector.

In response to continuing difficulties in filling positions, the employers would be most likely to increase compensation, increase their investment in training, more aggressively promote job openings through traditional approaches, and test out new strategies to attract workers.

When asked about skills in short supply, two-thirds of employers (63%) identified work ethic/attitude and commitment towards work.

In addition to work ethic, some of the commonly identified reasons included leadership and interpersonal skills (identified by 44% of employers), critical thinking skills (41%), people management skills (41%), operations management skills (41%), technical skills (41%) and physical skills and endurance (38%).

When discussing shortages, key informants focused mostly on the need to better develop managers, address succession issues, and become more effective in attracting and retaining staff.

Several key informants noted that the industry is not very effective at developing managers, in part because of the limited pool of potential candidates. It was noted that many field staff are in the sector for only a few years and have limited interest in advancing in the industry. That challenge is compounded by the aging of the workforce; most contractors have been operating for more than 20 years and there are succession issues amongst both ownership and senior management.

Key informants also noted that the industry is facing increasing competition for entry level workers. It was suggested that options to get good paying summer jobs for young people have increased. Recent and planned raises in the minimum wage have narrowed the differential between the wages paid by the industry and those paid by other sectors. At the same time, some aspects of the industry may be less appealing to youth than they were 10 or 20 ago. Some key informants suggested that there is less interest amongst youth in physical jobs and working outside than may have been true 20 years ago, people want better work-life balance, and more consistent work and a longer work-term.

Question 7: In what manner and to what extent are the training and skills development needs of the industry being met? What are the key gaps that need to be addressed?

Almost all employers with staff provide at least some form of training for their staff.

The most common types of training are health and safety training and onboarding/orientation training for new employees. Somewhat less common are multi-day technical training taken by employees from outside sources, technical workshops or seminars on topics relevant to particular positions, and formal mentoring programs. When asked on a scale of 1 to 5, where 1 is not at all useful and 5 is very useful, the employees reported the usefulness of the training their employer provided to them as a 3.8.

Medium and larger sized employers also provide some form of training to prepare workers who are interested in moving into supervisor, crew chief and management roles in the organization.

A little over one-quarter of employees in the industry (28%) indicated that they are very interested in further advancing their career in the industry. When asked on a scale of 1 to 5, where 1 is not at all interested and 5 is very interested in further advancing their career in this sector, employees provide an average rating of 3.4. About 25% of the employees who expressed an opinion are considering or will definitely make this sector a career while 38% expected to work at least a few more years. Thirty percent were unsure while 7% expected that 2021 will be their last year in the sector.

The primary motivators that encourage field staff to move into management positions include an opportunity to gain management experience, the desire for greater responsibility, the potential to increase wages and extend the work season, and reduced likelihood of physical injury. Overall, crew leaders and supervisors indicated that the job has involved more of a workload and was somewhat more difficult that they expected but also provided them with somewhat more income.

The most common types of management training received my new managers include mentoring; health and safety training; in-house training or webinars in management, operations and leadership skills; on-the-job training (e.g., starting with smaller crew with Job shadowing or coaching); external courses in management/supervisor training; and technical training (e.g., driving training).

Education and training programs are perceived by employers as somewhat effective in assisting people for positions that require specific education, training, designations and certifications.

Most positions do not require specific education, training, designations and certifications. Examples of positions which do have such requirements include first aid, Dangerous Tree Assessor, RPF and RFT designations, driving certifications, silviculture surveying, certified faller, and fire training (e.g., FireSmart and basic fire suppression). Some positions also require specific degrees (e.g., in forestry or horticulture). While third party training and educational programs are perceived as somewhat effective in preparing employees for their positions, many employers commit significant time and resources to the development of their employees for specific roles, particularly for more technical positions such as professional foresters and technologists.

When employers were asked to rate, on a scale of 1 to 5, where 1 is not at all effective and 5 is very effective, how effective existing education and training programs are in preparing employees for these positions, employers provided an average rating of 3.9. The average ratings were consistent across sectors ranging from a low of 3.6 in the forestry consulting sector to 4.0 in each of the other sectors. The most common concern expressed by the consulting firms was the lack of on-the-job-experienced gain by university and college graduates in the education programs.

Some of the changes suggested by key informants and others included:

- Ensure education and training programs meet with the requirements/expectations of employers and meet certification requirements;
- Continue to improve pre-season fitness training (look into cross training and diet);
- Work to professionalize the industry;
- Strengthen linkages between industry and educators/trainers (encourage more students in forestry and other related programs to work at meaningful jobs in the industry during their school years);
- Promote forestry-related education programs to youth;
- Increase access to training opportunities associated with certifications (e.g., for fallers)/the lack of accessibility results in companies missing out on contracts and work.

APPENDICES

ANALYTIC FRAMEWORK

ANALYTICAL FRAMEWORK

Analytical frameworks are used to facilitate structured and logical analysis. The following analytical framework was used to systematically approach the analysis process by outlining the research questions, the data required to answer them, and the data sources from which information would be derived.

<table>
<tr><th>Research questions</th><th>Data Required</th><th>Data Sources</th></tr>
<tr><td colspan="2">Characteristics of the Labour Market</td><td></td></tr>
<tr><td rowspan="3">What is the current size, composition and characteristics of the labour market and workforce for BC's silviculture sectors, including silviculture nurseries, tree planting, wildfire fighting, stand management (brush and spacing), and consulting foresters?</td><td>Employment in 2020
• Number of FTE employees reported by sector by BC employers overall in and outside of BC/regions served outside of BC (survey of employers)
• Number of BC FTE employees reported by employers by sector and job category (survey of employers)
• Breakdown of seasonal versus year-round employment by sector (survey of employers)
• Days worked by seasonal employees by sector (survey of employees)
• Peak number of people employed by sector in 2020 (survey of employers)
• Peak number of people employed by job category in 2020 (survey of employers)
• Number of people employed year-round by sector (survey of employers)
• Number of people employed seasonally and year-round by region (survey of employers)</td><td>▪ Survey of employers
▪ Survey of employees</td></tr>
<tr><td>Characteristics of Employers
• Number of firms by sector and by region (membership/population lists)
• Offices in and outside of BC/number of offices by region in BC (survey of employers)
• Age of operations (survey of employers)
• Size of operations: employment, revenues and wages (survey of employers)
• Percent of revenues from silviculture related operations (survey of employers)
• Establishment counts and range in number of employees (secondary data)</td><td>▪ Secondary data
▪ Survey of employers</td></tr>
<tr><td>Characteristics of Employees and Positions
• Characteristics of employees: gender, Indigenous, visible minorities, recent immigrants, TFWs (survey of employers and secondary data)
• Characteristics of employees: age, gender, Indigenous, visible minorities, highest level of education, enrollment in education in 2020 (survey of employees)
• Description of positions filled (sector, position, seasonal versus year-round/length of season, part-time versus full-time, involvement in field work, hours worked per week, location, annual employment income from the sector) (survey of employees)
• (If seasonal or part-time) Percent who would have preferred to work a longer period of time (survey of employees)</td><td>▪ Survey of employers
▪ Survey of employees
▪ Secondary data</td></tr>
</table>

Research questions	Data Required	Data Sources
	• Years worked in silviculture (survey of employees) • Number of employees worked for (survey of employees)	
	Size of the Sector • Sector outputs (e.g., data on expenditures by type of activity, seedlings produced, trees planted, hectares spaced and brushed) (secondary data) • Calculated ratios between outputs and revenues, FTE employment and person days (e.g., tree planted per day, hectares brushed and spaced per day drawn from survey of employers and employees) • Projection of employment by sector for 2020 (projections based on secondary data and ratios reflecting survey results) • Projection of economic impacts: direct, indirect, and induced revenues, GDP, employment, and taxes (projections based on secondary data and survey results) • Most recent data on number of firms, wages paid, and employment by NOC (secondary data)	▪ Secondary data ▪ Projections based on secondary data and survey results
What are the major drivers of workforce demand for BC's silviculture sectors, including nurseries, tree planting, wildfire fighting, brush and spacing, and consulting foresters over the next five to 10 years? What is the outlook for the sectors?	***Drivers of Economic Demand*** • Key drivers of further workforce demand by sector - e.g., government and private sector expenditures, productivity, adoption of new technology, changes in operations, etc. (survey of employers, key informant interviews and literature review) • Factors might be constraining further development of the sector in BC/ (key informant interviews) • Estimated employment by year 2015-2020 based on the key indicators (drawn from industry outputs and survey results) • Change in employment reported by employers over the past five years/contributing factors (survey of employers)	▪ Survey of employers ▪ Key informant interviews ▪ Secondary data ▪ Literature review
	Outlook for the Sector • Perceived economic outlook for the sectors (interviews with key informants) • Projected investment by government and the private sector/factors affecting the level of investment (secondary data, literature review and key informant interviews) • Available projections regarding seedlings produced, tree planting, brush and spacing, etc.) (secondary data) • Projections regarding the growth of each sector (projections based on secondary data and survey results) • Employer expectations regarding the growth of their firm over the next five years (survey of employers) • Expectations regarding the growth of the sectors (interviews with key informants) • Projected number of openings and employment levels by relevant NOC over the next five and ten years (secondary data)	▪ Secondary data ▪ Projections based on secondary data and survey results

<table>
<tr><th>Research questions</th><th>Data Required</th><th>Data Sources</th></tr>
<tr><td rowspan="2">What are the key labour market and employment, social, environmental and economic trends affecting the silviculture industry?</td><td>Comparison to the 2014 Survey (Tree Planting, Brushing and Spacing, Wildfire Fighting)
• Change in the size of the sectors since 2014 (comparison of projections)
• Changes in the characteristics of employers (comparison of survey results)
• Changes in the characteristics of employees (comparison of survey results)</td><td>▪ Results of the 2014 survey
▪ Survey of employers
▪ Survey of employees</td></tr>
<tr><td>• Key Trends and Issues Affecting the Industry
• Impact of climate change and environmental considerations on the sectors (literature review and key informant interviews)
• Impact of new and emerging technologies on the sector (literature review and key informant interviews)
• Perceptions regarding the major trends affecting each sector (survey of employers and employees and interviews with key informants)
• Trends that are impacting the ability of employers to recruit workers – changes in the characteristics of workers and perceptions of the sectors (literature review and key informant interviews)
• Changing population demographics/change in the size of the population that traditionally enters the market (secondary data and literature review)
• Priority that should be placed on increasing diversity of the work force - e.g., increasing participation of women, Indigenous, ethnic minorities, recent immigrants, etc. (survey of employers and employees, interviews with key informants)
• Priority that should be placed on strengthening employment standards going forward, better addressing harassment and bullying in the workplace, and improving health and safety measures (literature review; survey of employers and employees; interviews with key informants)
• Priority that should be placed by the sectors on accelerating the adoption of new technology in the workplace (survey of employers and employees, interviews with key informants)
• Priority that should be placed by the sectors on addressing business succession issues (survey of employers and employees, interviews with key informants)
• Priority that should be placed by the sectors on improving the profitability of the companies in the industry (survey of employers and employees, interviews with key informants)
• Changing skills requirements and employment expectations (literature review and key informant interviews)
• Other key economic, social or environmental issues and trends should be a priority for action going forward (survey of employers and employees; interviews with key informants; literature review)
• Implications of key trends and ongoing changes on employers (key informant interviews)</td><td>▪ Survey of employers
▪ Survey of employees
▪ Key informant interviews
▪ Secondary data
▪ Literature review</td></tr>
</table>

Research questions	Data Required	Data Sources
	• Specific recommendations regarding actions that should be taken to improve labour market conditions in the sector (survey of employers and employees; interviews with key informants)	
What has been the impact of COVID-19 on the silviculture industry?	***Impact of COVID-19 on Employers*** • Level of work performed in 2020 (survey of employers) • Measures implemented related to health and safety (survey of employers) • Costs associated with field operations (survey of employers) • Labour productivity (survey of employers) • Employment levels during your peak season (survey of employers) • Employment levels during the off-peak time (survey of employers)	▪ Survey of employers
	Impact of COVID-19 on Employees • Appropriateness of measures implemented by employer (survey of employees) • Legacy impacts and ongoing concerns related to COVID-19 (survey of employees)	▪ Survey of employees
	Impact of COVID-19 on the Sector • What impact did COVID-19 on the sector in 2020? (Interviews with key informants) • Continuing impacts and legacy of the pandemic (interviews with key informants) • Broader impact of COVID-19 on the sector (literature review)	▪ Key informant interviews ▪ Literature review
Recruitment and Retention		
What, if any, issues (e.g., awareness, nature of the work, work and workplace issues, income) are constraining the ability of the sector to recruit and retain workers in BC? What recruitment and retention strategies are being used effectively by employers and in the sector to recruit, develop and retain workers?	***Recruitment of Workers*** • Initial source of awareness for employees working in the industry (e.g., family connection, education programs, people in the industry, friends or acquaintances, social media, job ads or postings, job fair, other) (survey of employees) • Employer and employee perceptions regarding the priority that should be placed by the sectors on improving awareness and perceptions of the sector as a potential source of employment for youth (survey of employers and employees, interviews with key informants) • Expected hiring over the next 12 months (number and leading positions) (survey of employers) • Anticipated difficulties in recruiting qualified candidates for these positions (survey of employers) • Strategies employed by employers to create awareness of positions (e.g., through existing employees, friends or acquaintances, rely on being contacted, social media, company website, advertising or job postings, recruitment companies, job fairs, etc.) (survey of employers)	▪ Survey of employers ▪ Survey of employees
	Retention of Workers • Perceptions regarding the priority that should be placed by the sectors on finding ways to keep people in the sector for longer (survey of employers and employees, interviews with key informants) • Rate of staff turnover amongst permanent employees (survey of employers)	▪ Survey of employers ▪ Survey of employees

Research questions	Data Required	Data Sources
	• Factors contributing to staff turnover amongst permanent employees (survey of employers) • Characteristics of permanent employees who are most likely to leave (e.g., in terms of gender, age, years of experience, etc.) (survey of employers) • Strategies companies use to try to manage turnover among permanent employees (survey of employers) • Staff turnover amongst seasonal workers (percent who returned in 2020 from 2019, had previously worked for the organization, or were new to the organization) (survey of employers) • Percent of new seasonal employees who had no previous experience in the position (survey of employers) • Anticipated percent of seasonal workers who will return for 2021 (survey of employers) • Plans of seasonal employees 2021 (e.g., return to same employer, different employer, leave the sector, other) (survey of employees) • Where non-returning workers went (e.g., moved to another employer in sector, moved outside sector, enrolled in education, not working for other reasons) (survey of employers) • Employee perceptions as to why a worker plans to leave the sector (e.g. better pay, steadier work, opportunities for career advancement, less physically demanding work, better working conditions, work related to education, other) (survey of employees) • Employer reasons why workers leave the sector (e.g., seasonal work, competition from employers in other sectors, nature of work, working conditions, health, not invited back, etc. (survey of employers) • Employee reasons why an employee is planning to switch employers (e.g., pay, steadier work, opportunities for career advancement, better working conditions, issues with a manager or co-worker, ready for a change, not recruited back by employer, other) (survey of employees) • Characteristics of workers most likely to leave the sector (e.g., in terms of gender, age, years of experience, etc.) (survey of employers) • Length of time worker expects to remain in the sector (committed/considering making it a career, for at least a few more years, take it year-by year, expect 2021 will be last year, other) (survey of employers) • Strategies companies use to retain employees (e.g., communication during off-season, compensation, opportunities for development, extending the season, financial incentives, positive work environment, better equipment and conditions, focus on safety, fairness, training, recognition and rewards program, etc.) (survey of employers) • Employee perceptions of what employers could do (or have done) to encourage them to stay (survey of employers)	

Research questions	Data Required	Data Sources
	Employee Satisfaction • Level of employees' satisfaction with their experience in working in this sector (survey of employees) • Perceived advantages and disadvantages of working in sector (wages, seasonality, predictability of how much work will be available, physicality, setting, working conditions, relationships with co-workers, opportunities for advancement, sense of fulfilment, ability to do the work, other) (survey of employees) • Level of satisfaction with their employer (survey of employees) • Rating of 2020 employer in terms of fair treatment, maintaining a respectful workplace free from harassment and bullying, tolerance for individuality, concern for safety, organization & logistics, quality of tools and equipment, quality of management/supervisor support, environmental stewardship, accommodations, meal options at camp, assisting workers prepare for the season, other (survey of employees)	▪ Survey of employees
Are there current and projected shortages for silviculture workers in BC? If so, in what sectors and types of positions (i.e., roles and responsibilities) are the shortages projected to be most acute?	***Labour and Skills Shortages*** • Three positions for which it is most difficult to find appropriate candidates with the needed skills (survey of employers and key informant interviews) • Expectations regarding how shortages will change and evolve over the next three to five years (key informant interviews) • Factors contributing to difficulties in attracting qualified candidates (e.g., few applicants with needs experience, skill sets, personal attributes or education, training, or certifications required, competition from other companies in the sector and other sectors, many are nearing retirement, limited interest in the sector or occupation amongst youth, other) (survey of employers (survey of employers and key informant interviews) • Specific skills set that are most in short supply (ability to work independently, communication skills, critical thinking skills, familiarity with working outdoors, language skills, leadership and interpersonal skills, management skills, physical skills and endurance, team skills, technical skills, work ethic/attitude, other) (survey of employers) • Factors that contribute to field workers decision to take on supervisor or crew chief role (wages, days, prefer higher-level position, opportunity to gain management experience, other) (survey of employees) • Strategies or actions organization is most likely to undertake in response to these anticipated difficulties (employ new strategies, aggressively promote, increase wages, hire temporary foreign workers, reduce job requirements, invest in equipment or technology, invest in training, slow business growth, increase staff hours, outsource certain functions, other) (survey of employers) • Anticipated changes in skills requirements over time (survey of employers and key informant interviews)	• Survey of employers • Survey of employees

Research questions	Data Required	Data Sources
Training and Mentorship		
In what manner and to what extent are the training and skills development needs of the industry being met? What are the key gaps that need to be addressed?	• Key requirements for education and training related to each sector/types of education, training, designations and certification are important to the sector/how being provided (key informant interviews) • Training and skills developed provided by the employers (e.g., onboarding/orientation, health and safety training, technical workshops or seminars on topics relevant to particular positions, funding for multi-day technical training, formal mentoring program, other) (survey of employers) • Support for training and skills development received by employees (e.g., onboarding/orientation, health and safety training, technical workshops or seminars on topics relevant to particular positions, funding for multi-day technical training, formal mentoring program, other) (survey of employees) • Training and other support provided to prepare workers moving into crew chief, supervisor, and management roles (survey of employers) • Employer expenditures on employee training as a percent of revenues (survey of employers) • Positions where education, training, designations and certifications are very important in your decision to hire specific workers (survey of employers) • Required/preferred education, training and certifications (e.g., Registered Professional Foresters and Registered Forest Technologists) (survey of employers) • Education, training, designations or certifications identified as employees as relevant to your position in the sector (survey of employers) • Perceived effectiveness of the existing education and training programs in preparing people for positions (survey of employers and employees; key informant interviews) • Key areas where programs are not meeting the needs of employers (survey of employers and key informant interviews) • Additional training or support that would be useful to the employee (survey of employees) • Priority that should be placed by the sector on strengthening education and training programs focused on forestry, strengthening training and support provided to new employees and those already in the sector, and better preparing new and returning seasonal workers for the start of the season (survey of employers and employees; interviews with key informants)	• Survey of employers • Survey of employees • Key informant interviews