Silviculture Innovation Program

Bulkley Valley Research Centre

How

COMMUNITIES OF PRACTICE

Can Support

INNOVATIVE SILVICULTURE

In British Columbia

WHAT WE HEARD | *A Survey of the Experiences of Forestry Practitioners and their Communities of Practice and Extension Resources that Support Innovative Silviculture*

FEBRUARY 2025

How Communities of Practice Can Support Innovative Silviculture in British Columbia

What We Heard: A Survey of the Experiences of Forestry Practitioners and their Communities of Practice and Extension Resources that Support Innovative Silviculture

Released February 5, 2025

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EXECUTIVE SUMMARY

In the summer of 2024, the Silviculture Innovation Program conducted a comprehensive survey to understand the needs and experiences of forestry practitioners in British Columbia regarding their experiences and perspectives with their communities of practice and extension resources and how they support the implementation of innovative silviculture.

The survey received 564 respondents, primarily from provincial government operations and consultancies, with the highest representation from the Central Interior, Coast, and Northwest regions. The majority of respondents (63%) were at least somewhat familiar with innovative silviculture.

Key findings for the **State of Communities of Practice** (COPs):

- Most respondents (68%) felt supported by their COPs to implement innovative silviculture. On average, respondents were a part of two to three COPs that supported their work in innovative silviculture.
- Respondents valued the COPs for their role in supporting: knowledge sharing; knowledge exchange and discussing ideas; practical knowledge creation, field applications and training opportunities; networking, access to experts and peer-to-peer interactions; and fostering community, culture and cohesion.

- Respondents called for enhancing COPs by: growing awareness of COPs; incorporating more practical applications and real-world scenarios; increasing mentorship opportunities; supporting early career foresters and practitioners; breaking down silos; addressing barriers to engaging with COPs, such as time, cost and accessibility; and recognizing barriers to implementing innovative silviculture beyond COPs.
- The report additionally proposes a conceptual framework for COPs, highlighting the need for both participatory and informational COPs to support practitioners.

Key findings for the **State of Extension Resources**:

- Over half of respondents (64%) stated they could not easily find information to support their work on innovative silviculture.
- The most popular extension resources were: field tours, conferences, peer-reviewed literature, and one-on-one meetings with experts or colleagues.
- Four key areas to enhance extension resources are described, including addressing: practical knowledge needs; enhancing resources and tools; increasing knowledge transfer for treatments and knowledge transfer for multiple values.
- Respondents have a strong desire for more practical, field-based learning opportunities and centralized access to resources.

More broadly, the survey indicates that a strong component of knowledge transfer occurs at a peer-to-peer level for forestry practitioners, as evidenced by the highly valued aspects of COPs and extension resources that provide opportunities to meet in-person, in-field and connect directly (i.e. participatory COPs). This necessitates an approach to extension that prioritizes opportunities for colleagues to connect and/or emulates the benefits of those interactions. While many of the challenges facing practitioners implementing innovative silviculture are often characterized by knowledge gaps and access to existing knowledge, the survey results emphasize the need to additionally consider access to knowledge holders themselves, such as mentors, peers and colleagues to better support the implementation of innovative silviculture.

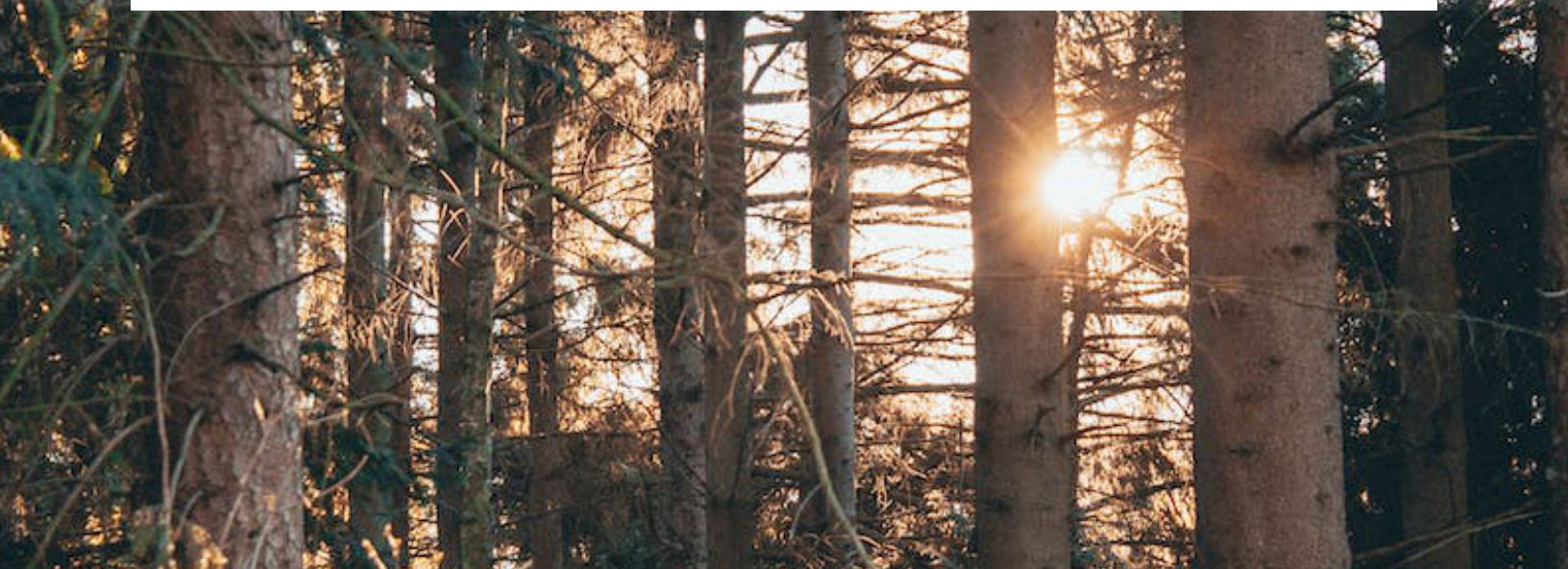

PHOTO // **Above Seymour Ridge, near Smithers, BC** (Sarah Belford)

ABOUT THE SIP

The vision for the Silviculture Innovation Program (SIP) is that innovative silvicultural systems are applied widely across British Columbia's forested ecosystems for the stewardship of multiple values. The SIP focuses on expanding knowledge through applied and operational research and mobilizing knowledge through extension. The SIP is administered by the Bulkley Valley Research Centre (BVRC), a non-government organization based in Smithers, BC. The SIP was established in April 2023 following the release of the Old Growth Strategic Review, which calls on the exploration of ways to use innovative silvicultural practices as tools to manage a diverse range of values and interests on the landscape (Recommendation #12).

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COVER PHOTO // **Participants at the 2024 SISCO Fall Field Tour, Pemberton, BC** (Gillian Chow-Fraser)

How COMMUNITIES OF PRACTICE *Can Support* INNOVATIVE SILVICULTURE *In British Columbia*

INTRODUCTION

Background

The goal of the Silviculture Innovation Program (SIP), is to accelerate the growth of existing and future applications of innovative silviculture across BC through research and extension. Innovative silviculture (also called "adaptive silviculture") creates a framework for stewarding multiple values at the stand and landscape scale, ranging from the physical to the spiritual. Managing forests for multiple values such as water, wildfire resilience, wildlife habitat, forest health, old growth structure, etc. requires a collaborative approach. This ensures that knowledge systems (e.g., western scientific approach, Indigenous knowledge and science) are bridged and inform each other. Supporting diverse knowledge systems helps structure research questions and projects, extension processes and products, and ultimately inform mainstream silviculture practice and policy.

PHOTO // SISCO Fall Field Tour participants listening to a field session presentation (Gillian Chow-Fraser)

While innovative silviculture practices, such as partial harvesting (also referred to as variable retention), have been historically utilized, clearcut logging remains the most widespread and dominant silviculture practice. Currently, approximately 95% of forest management utilizes a clearcut with reserve system in BC (Figure 1).

In the last decade, the shift in the social values placed on forests, and their management, spurs us to think both practically and creatively on how a more holistic conception of silviculture can be applied. The SIP program was forged on the principle that by contributing to applied research and extension on innovative silviculture, we can ensure knowledge is available to inform the implementation of more diverse silvicultural strategies across BC.

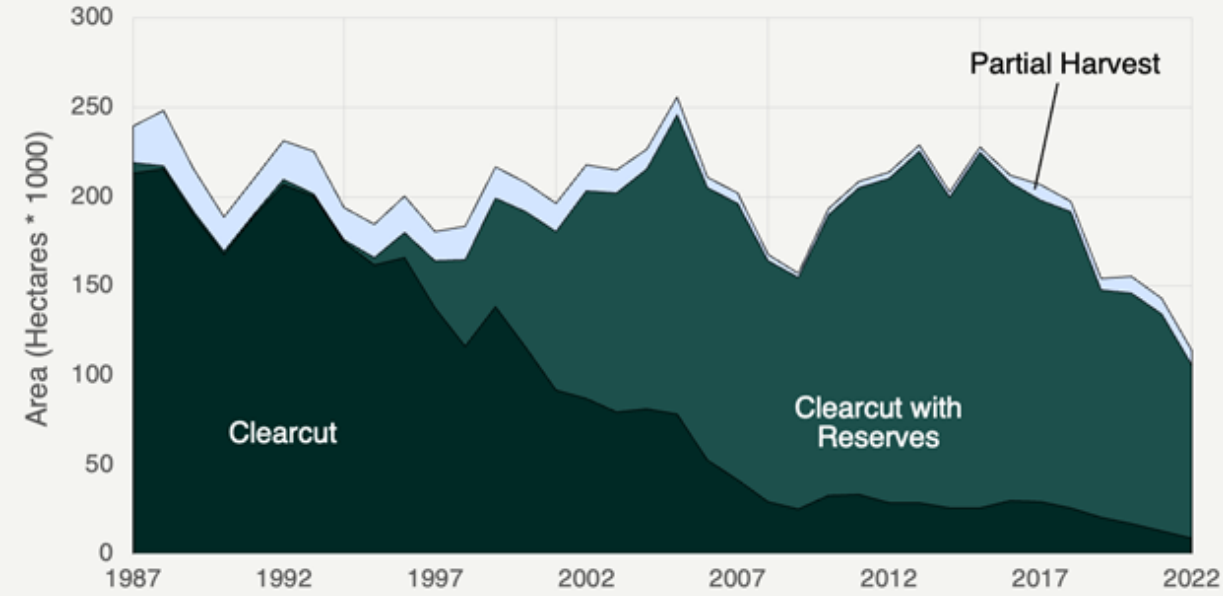

Figure 1. Area of Crown forest harvested in BC from 1987 to 2022 using clearcut, clearcut with reserves, and partial harvest silvicultural systems. Original figure accessed at: https://www.env.gov.bc.ca/soe/indicators/land/silviculture.html. Updated by forest management analyst in the Forest Science, Planning and Practices Branch, Office of the Chief Forester, B.C. Ministry of Forests.

PHOTO // A clearcut in northwest BC (Laura Stanton)

HELPFUL DEFINITIONS

Community of Practice | A community of practice refers to a group of people who share a common interest, profession, or passion and engage in collective learning and knowledge-sharing. Members of a community of practice come together to interact, collaborate, and deepen their understanding of a particular area of interest, which might include sharing of skills, techniques, insights, and new approaches. Communities of Practice can exist in various settings, including workplaces, professional associations, online forums, or informal gatherings. They play a crucial role in facilitating collaborative learning, problem solving, and the exchange of knowledge gained through experience and practice.

Extension | Extension is a practice of building trust, relationships, and capacity to enable collaboration. Extension supports active engagement with diverse stakeholders and all levels of government (Indigenous and municipal, provincial, federal) to identify opportunities, information needs, and synergies. A foundational principle of extension is spanning boundaries and centering reciprocity, with a focus on two-way knowledge creation and mobilization. When it comes to knowledge dissemination, extension actively reframes, translates, and mobilizes knowledge depending on different audiences and contexts.

Innovative Silviculture | Innovative silviculture includes systems for the harvesting, growing and tending of forests where the primary objective is to achieve holistic stewardship of the land base. Innovative silviculture systems are driven by an appreciation of ecological, social, cultural, and economic values of forests, where stewardship is focused on maintaining the continuity of dynamic ecosystem processes and functions.

Survey Purpose & Design

One of the goals of the SIP is to ensure that projects and resources are purposefully designed and intentionally meet the needs of practitioners and those actively planning and/or implementing innovative silviculture. This survey of practitioners was a necessary step to clarify what practitioners need from research and extension and how the SIP can address those needs. In particular, we sought to deepen the SIP's understanding of the role of Communities of Practice in supporting innovative silviculture, as well as understand how professionals are engaging with resources that support innovative silviculture. The intention of the survey was to better understand practitioners, including professionals in forestry operations or management, fire operations or management, and/or silviculture.

Our goal was to answer three overarching guiding questions with our survey:

1. **How** can we continue to **support and grow Communities of Practice** that enable innovative silviculture?
2. **How and why** are individuals in the innovative silviculture space **using resources** to support their work and **how** are individuals **accessing these resources**?
3. **What are the most important extension gaps** facing innovative silviculture Communities of Practice?

The survey was composed of 16 questions: five dropdown/checkbox questions, two multiple choice questions, two ranking questions, and seven open-ended questions. The survey was also divided into four sections: 1) Respondent background and experience with innovative silviculture, 2) Perspectives on Communities of Practice, 3) Perspectives on extension resources and activities and 4) Respondent Extension Needs.

Survey responses were collected over six weeks from July 15, 2024 to August 30, 2024. The survey was open to anyone who self-identified as a forestry, silviculture, or fire professional. The survey was circulated through email via organizational and association mailing lists and across social media platforms, including the Silviculture Innovation Program, Forest Professionals BC, BC Community Forests Association, Woodlots BC, the Truck Loggers Association and the BC First Nations Forestry Council.

Quantitative data were compiled from the dropdown/checkbox, ranking and multiple choice questions. Qualitative data from the seven open-ended questions were used in a thematic text analysis. Themes were identified and grouped, and the frequency of times a respondent's response aligned with that theme were quantified. Based on the survey results about Communities of Practice, we developed a conceptual framework to help understand the main features and types of COPs that people engage with. All results are reported below.

ABOUT THE SURVEY RESPONDENTS

In total, there were 564 survey respondents. Not all questions were mandatory, and thus each question varied in its participation. Each survey question had an average of 333 responses (59% of total respondents) with a range of 158 to 564 responses across all questions.

The range of respondents varied in professional background (Question 1). There were 18 different affiliations of respondents, including seven respondents that fell into the "Other"

category (7 respondents, 1%). The most frequent professional affiliations of the respondents was "Government - Provincial, Operations" (163 respondents, 29%) and "Consultant" (162 respondents, 29%). Combined, the two top affiliations account for 58% of respondents (Table 1).

Survey respondents varied in regional representation (Question 2). The regions with the most representation included the Central Interior (190 respondents, 34%), the Coast (145 respondents, 26%) and the Northwest (93 respondents, 17%). Other regions represented include: the Southwest (71 respondents, 13%), Southeast (69 respondents, 12%), Northeast (42 respondents, 7%), work at the provincial scale (89 respondents, 16%), work at the federal scale (4 respondents, 1%) and work within their Nation's territory (18 respondents, 3%).

Over 60% of respondents said they were familiar with innovative silviculture to some degree (Table 2, Figure 2, Question 3). Most respondents said they were "somewhat familiar with innovative silviculture" (153 responses, 27%), meaning they've helped plan and/or implement innovative approaches but not led them. Twenty-two per cent of respondents were very familiar with innovative silviculture (124 responses, 22%) and 14% of respondents were extremely familiar (77 responses, 14%). Roughly 37% of respondents were not familiar with innovative silviculture - either "not so familiar" (138 responses, 25%) or "not at all familiar" (70 responses, 12%).

Table 1. A summary of professions and affiliations of survey respondents (Question 1).

Profession and/or Affiliation	Number of Responses	Percentage (%)
Government - Provincial Operations	163	29
Consultant	162	29
Major Licensee	55	10
Woodlot Licensee	44	8
First Nation Licensee	22	4
Community Forest	21	4
Retired	18	3
Non-Governmental Organization	16	3
Government - First Nations	12	2
Academic Institution	11	2
Industry Association	9	2
Other	7	1
Government - Provincial, Research	6	1
Research Forest	4	1
Government - Local/Regional	4	1
Private land manager	4	1
Regulator/Certification	3	1
Government - Federal	2	<1
Contractor - Operations	1	<1
Total	**564**	

Table 2. Respondent self-assessment of familiarity with the innovative silviculture space (Question 3).

How familiar are you with the innovative silviculture space?	Number of Responses	Percentage (%)
Somewhat familiar *(I've helped plan and/or implement innovative approaches but not led them)*	163	29
Not so familiar *(I'm still learning about innovative silviculture and thinking about how to implement it)*	162	29
Very familiar *(I've planned a prescription and/or I've implemented a treatment)*	55	10
Extremely familiar *(I've planned multiple prescriptions, implemented multiple treatments, and/or I teach others about it)*	44	8
Not at all familiar *(This is a new topic to me)*	22	4
Total	**562**	

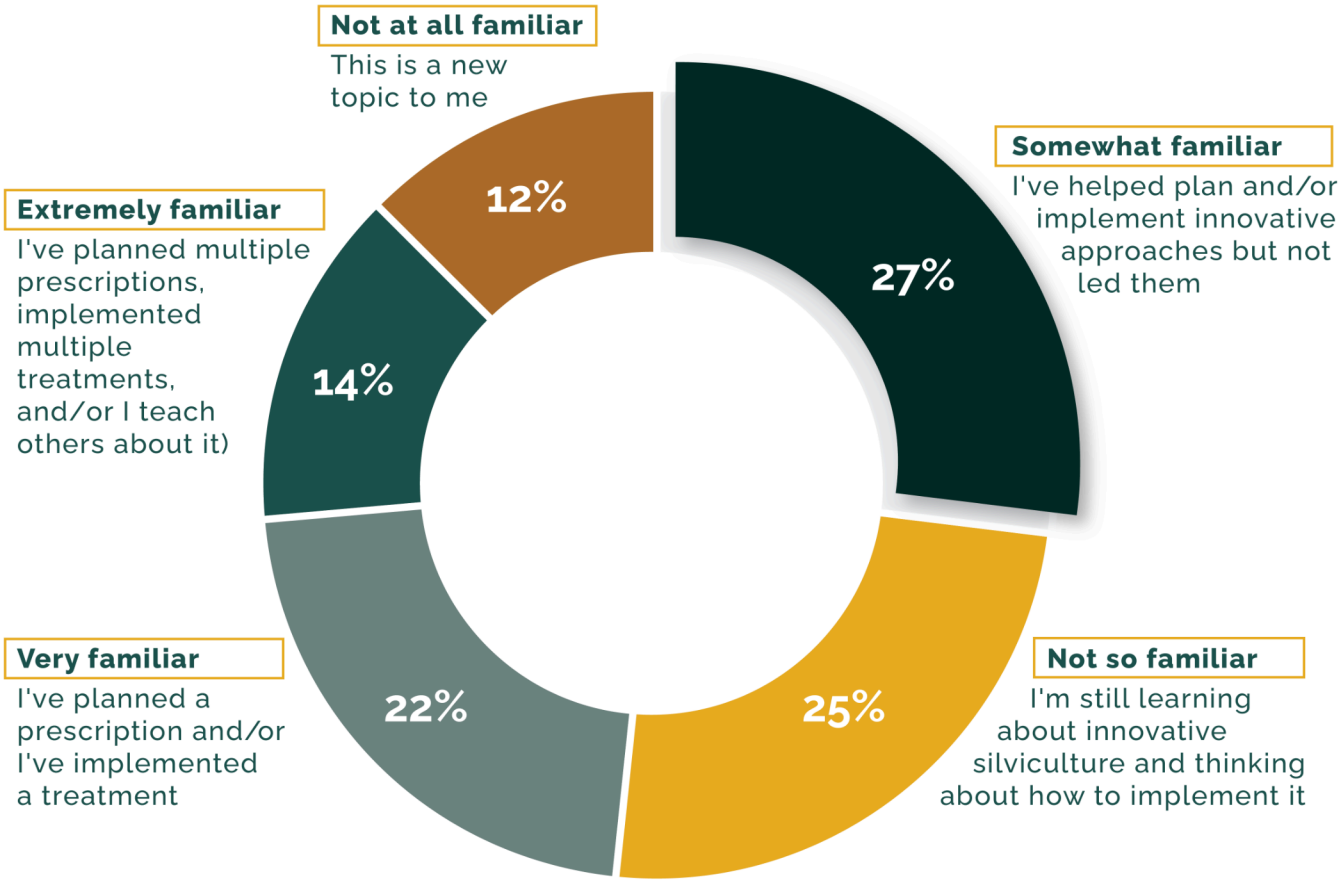

Figure 2. Respondent self-assessment of familiarity with the innovative silviculture space.

CURRENT STATE OF COMMUNITIES OF PRACTICE

An Overview of the State of Communities of Practice

Overall, 68% of respondents agreed that they felt supported by their existing Communities of Practice (COP) to implement innovative silviculture (respondents selected "Agreed" or "Strongly Agreed", Question 5) (Table 3, Figure 3).

On average, respondents said they were a part of two to three Communities of Practice that supported their work in innovative silviculture (average of 2.3; maximum of 10) (Question 4). The most popular COP was Forest Professionals BC (FPBC) with 76% of respondents reporting they were a part of it, followed by the three silviculture committees (Southern Interior Silviculture Committee, Northern Silviculture Committee and Coastal Silviculture Committee) accounting for roughly 25%, 24% and 18% of survey responses, respectively (Table 4). Six percent of respondents (21 respondents) said they were not a part of any Communities of Practice that supported the implementation of innovative silviculture (described as a portion of "Other"). When including the additional COPs listed in the "Other" dropdown, respondents identified a total of 74 different Communities of Practice that supported their work in innovative silviculture.

Respondents were also asked to rank the importance of various factors about their COPs (Table 5, Table 6; Question 7, 8). The most important aspects of a COP was the geographical region of focus and topics of focus (Table 5), while respondents very strongly felt the most preferred take-aways of their COPs was knowledge sharing (Table 6).

Table 3. Total responses to the question: On a scale of one (Strongly Disagree) to four (Strongly Agree), how much do you agree with the statement: "I feel supported by my Communities of Practice to help me carry out or support the application of innovative silviculture" (Question 5).

Opinion	Number of Responses	Percentage (%)
Strongly Disagree	29	8
Disagree	86	24
Agree	220	61
Strongly Agree	26	7
Total	**361**	

Figure 3. Roughly 7 out of 10 respondents felt supported by their Communities of Practice to help carry out or support the application of innovative silviculture.

Table 4. Communities of Practice that respondents are a part of that support their work in innovative silviculture in BC (Question 4). Respondents specified additional Communities of Practice when they selected "Other" or described that they felt there were none that supported them.

Community of Practice	Number of Responses	Percentage (%)
Forest Professionals BC (FPBC)	250	76
Southern Interior Silviculture Committee (SISCO)	81	25
Northern Silviculture Committee (NSC)	80	24
Coastal Silviculture Committee (CSC)	59	18
Woodlots BC	54	17
Canadian Institute of Forestry	54	17
Forest Enhancement Society of BC (FESBC)	42	13
BC Community Forest Association (BCCFA)	38	12
BC First Nations Forestry Council (FNFC)	23	7
Western Forestry Contractors Assocation (WFCA)	23	7
Truck Loggers Association (TLA)	19	6
BC Wildlife Federation	15	5
Prescribed Burn Association	5	2
BC Summit of First Nations	3	1
BC Professional Firefighters Association	2	1
The Fire Chief's Association of BC	1	<1
Other	86	26
Total	**328**	

Table 5. Respondents were asked to rank the importance of five drivers that might dictate how a professional decides which Communities of Practice to engage with (Question 7). The drivers were ranked from 1 (least important) to 6 (most important). The responses were given a weighted score and indicates which responses were preferred overall.

Consideration	Most preferred (weighted score)
Geography (e.g., region of work for the Community of Practice)	4.3
Topics (e.g., partial harvest, commercial thinning, etc.)	4.2
Target audience (e.g., the most similar types of workers and position or role, such as planners, operators, biologists, silviculturalists, etc.)	4.0
Ecosystem (e.g. based on BEC zone)	3.4
Champions (e.g., does the Community of Practice include innovators that inspire?)	3.2
Ability to grow in your career (e.g. achieve credentials or certificates, or gain professional status/ liability protection)	1.9

PHOTO // (Gillian Chow-Fraser)

Table 6. Respondents were asked to rank the importance of six aspects of Communities of Practice (Question 8). The features were ranked from 1 (least important) to 6 (most important). The responses were given a weighted score and indicates which responses were preferred overall.

Consideration	Most preferred (weighted score)
Sharing resources and knowledge	4.8
Presentations from experts	3.9
Meeting in-person	3.9
Field tours and in-field demonstrations	3.7
Seeking collaborations	2.8
Mentorship opportunities	2.0

The Benefits of Communities of Practice

Respondents were asked to describe how their COPs support or do not support innovative silviculture (Question 6). Based on a portion of written responses to Question 6, five main benefits were identified, including:

1. Knowledge sharing and delivery
2. Knowledge exchange and discussing ideas
3. Practical knowledge creation, field applications and training opportunities
4. Networking, access to experts and peer-to-peer interactions
5. Community, culture and cohesion.

Herein, we describe these key benefits and provide a visualization (Figure 4).

PHOTO // BC Community Forest Association field tour, MacKenzie, BC (Gillian-Chow Fraser)

BENEFIT 1 | Knowledge Sharing & Delivery

COPs were largely described as places to share and deliver information on resources and knowledge on different practices and tools. Many described the benefit of COPs as places to learn about exemplary work being done nearby and across the province, and "illustrate creative alternatives to the status quo". Respondents valued gaining awareness of how research trials and initiatives were being set up, what approaches were being tested and where, and where the information was being distributed or disseminated. COPs were viewed as venues and forums that allowed for the distribution of information to a wide audience, whether through regular in-person meetings or through remote resources such as webinars, information sessions, newsletters and/or magazine publications.

> *"COPs help by showcasing other professionals' work across the province and share experiences."*
> –Survey Respondent

"I really appreciate SISCO as a single event that helps to inform on any changes and new practices, [...] FPBC is great at getting out new publications and research through the monthly newsletters." (Survey Respondent)

"COPs help by showcasing other professionals' work across the province and share experiences." (Survey Respondent)

BENEFIT 2 | Knowledge Exchange & Discussing ideas

Respondents valued the aspects of COPs that enabled other innovators to informally share their successes and failures to help others learn, especially opportunities that enabled discussions directly with those that planned, implemented and/or operationalized the approach. Many also described the benefit of COPs as valuable places to "brainstorm" new ideas. Roughly 10% of respondents described their COPs as a place to learn about and discuss ideas, old and new, about innovative silviculture. COPs that provided space to create collaborative solutions to silviculture-related issues were greatly valued, where participants could share their own personal experiences and perspectives directly with each other.

"[COPs are places to] discuss ideas, listen to others points of view, learn about what is and is not working." (Survey Respondent)

BENEFIT 3 | Knowledge Exchange & Discussing ideas

Respondents valued COPs that provided in-field opportunities to learn about real world applications of innovative silviculture. Regional silviculture committees were consistently commended for providing tangible operational examples of innovative silviculture through their biannual meetings and field tours. Respondents commented that many of the field tours were at local scales and often limited to area-based tenures, such as community forests and research forests, but still helpful in generating ideas that could be applied at other scales.

"The three primary avenues for being supported in alternate silviculture for several decades have been the three silviculture committees. When attending their conferences or field tours, I have been supported by new ideas and practical tools on how to promote both conventional and innovative silviculture systems." (Survey Respondent)

"Field tours and workshops are great methods of collaborating on innovative silviculture." (Survey Respondent)

PHOTO // BC Community Forest Association field tour, MacKenzie, BC (Gillian-Chow Fraser)

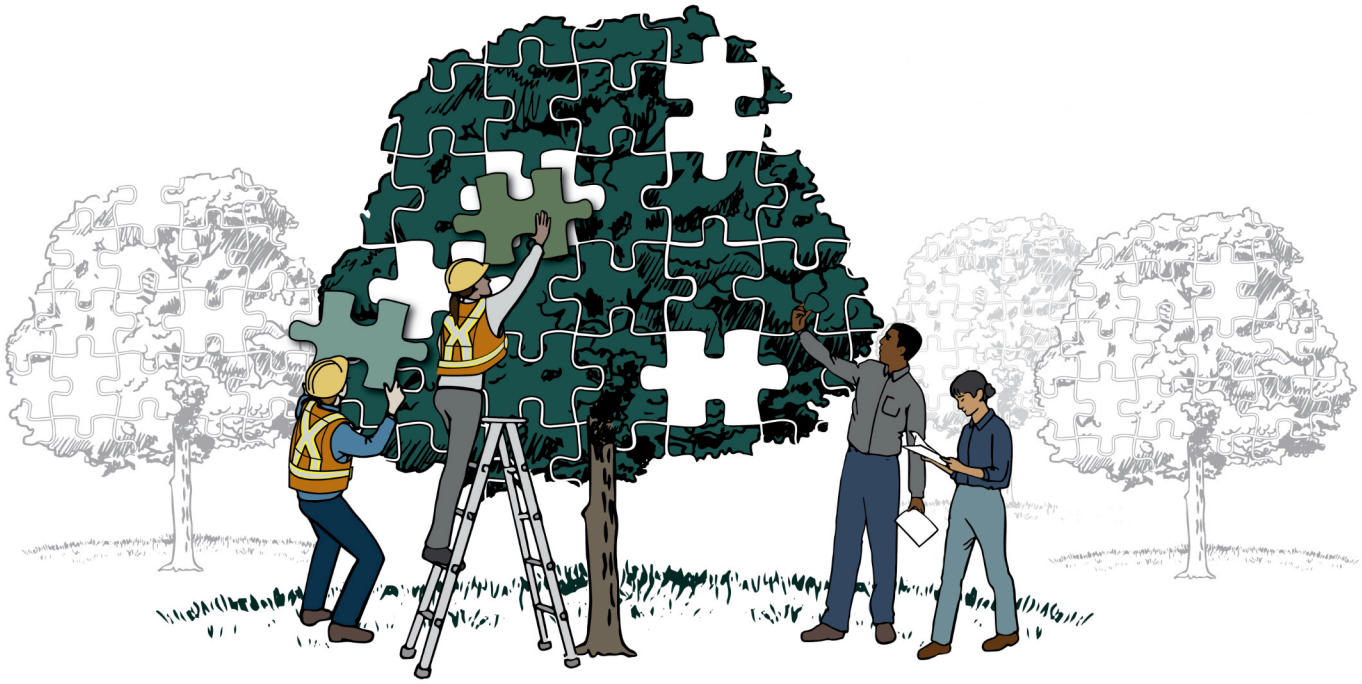

Figure 4. A visualization of a community of practice bringing together different experts and practitioners to share different pieces of knowledge to build a collaborative solution to a problem (or puzzle). A COP may provide opportunities for direct knowledge sharing and exchange and/or opportunities to learn from experts.

BENEFIT 4 | Networking, Access to Experts & Peer-to-Peer Interactions

COPs were valued for their opportunities to grow networks and establish relationships with peers in-person - these were the second and third most preferred aspects of COPs according to respondents (Table 6). Respondents felt COPs helped them understand who to contact regarding particular innovative silviculture questions, especially via field tours and conferences. COPs that allowed for dialogue with experts, including opportunities for informal conversations, were also extremely valued. Many respondents even described their own peer network as a strong informal COP, which they had developed and grown over years, and which provided their best avenue to find out more about certain innovative practices.

"Northern Silviculture Committee is great for highlighting current innovative practices happening locally. It has helped me understand who the folks would be to get in contact with if needed." (Survey Respondent)

"Due to my length of activity in silviculture, I have been able to build a large network of resource forest professionals that I can discuss or query to help make better assessments/recommendations." (Survey Respondent)

BENEFIT 5 | Community, Culture & Cohesion

Respondents appreciated the culture within the COPs, describing them as inspiring, rewarding and motivating spaces. It was felt that the most progressive COPs reflected a shift in perspectives on innovative silviculture

and fostered more open discussions about alternatives. COPs were also viewed as supporting professionals in the innovative silviculture space by making them feel they had a collective voice and unified front. Many respondents valued the role of COPs to advocate for issues on behalf of their members and felt they worked to promote innovative silviculture or advocate for changes needed to enable more innovative silviculture.

"The groups that I am involved in help support work on innovative silviculture by working as a unified front to bring barriers to those that can address them." (Survey Respondent)

"They provide inspiration and opportunities to make useful connections." (Survey Respondent)

How to Enhance Communities of Practice

Respondents were asked about how their existing Communities of Practice could be enhanced (Question 9, Question 6), which informed the identification of seven key themes:

1. Continue to grow awareness of Communities of Practice
2. Improve practical and real-world applications
3. Increase mentorship opportunities
4. Support early career foresters and practitioners
5. Break down silos and build diversity and inclusion
6. Address barriers to accessing Communities of Practice
7. Recognize barriers beyond Communities of Practice

Herein, we describe these six areas of improvement and make recommendations for how COPs can continue to support, or even enhance their support, for the implementation of innovative silviculture based on the feedback from practitioners.

SUGGESTION 1 | Continue to grow awareness of Communities of Practice

While the majority of respondents felt supported by their existing Communities of Practice, many felt there was an opportunity to increase awareness and education on the network of COPs that support innovative silviculture practices. Respondents felt there was a need to have a more comprehensive understanding of what COPs existed, their objectives and goals, and who could join, especially those that were smaller working groups or subgroups of larger organizations. It was acknowledged that increasing awareness of COPs would help in increasing implementation of innovative silviculture practices through knowledge transfer and exchange.

> *"What would be useful is a Provincial Community of Practice on innovative silviculture to be kept informed of what's underway."*
> –Survey Respondent

"This is the first outreach on the topic that has attempted to define various COP's involved in [innovative silviculture] - so there's a lot more work involved." (Survey Respondent)

"Besides hearing of them offhandedly in the odd newsletter, I have not been made aware of most of these various COP's at this point in my career. This survey is a good starting point that hopefully demonstrates that [organizations] should make their members more aware of their existence and scope." (Survey Respondent)

We note that some respondents identified gaps in their existing COP network and suggested new COPs might be necessary, including those to support under-served regions like the Northeast or Northwest, and a COP specific to innovative silviculture at a provincial scale (i.e.: an Innovative Silviculture COP).

"I feel silviculture, an olde and time honoured field but long unsupported, is in a "new" infancy and needs an 'active' community of practice of its own." (Survey Respondent)

"What would be useful is a provincial COP on innovative silviculture to be kept informed of what's underway." (Survey Respondent)

SUGGESTION 2 | Improve Practical and Real-World Applications

Survey respondents highlighted the need to improve COPs by focusing on practical applications and actionable outcomes. Hands-on workshops, field tours, real-world forestry applications, and the translation of research into concrete, actionable insights were identified as essential components. Respondents described a need for more practical learnings that could directly

PHOTO // Watching a harvesting demonstration (Gillian-Chow Fraser)

inform how to successfully implement a similar practice, with a focus on communicating avoidable errors across all aspects of implementation, including prescription planning, planting, surveying, monitoring and reporting. There was also a strong desire for even more topics on innovative silviculture during COP meetings to better learn about the various options in innovative silviculture being explored and tested.

"Maintain focus on operational applicability; sometimes presentations speak to new research without a follow-up on how things can be implemented by practitioners." (Survey Respondent)

"Field trips to sites with innovative silviculture practices are best, and need to incorporate speakers that touch on all aspects of the planning and practice implementation (recce, silviculture system planning, FSP & FRPA/FPPR connections, block & road layout, site plan writing, appraisals, harvesting, and post-harvest surveying and reporting). If all aspects of planning and practices aren't covered, the attendees are left more with an idea than imagining how it can be incorporated into their own operations." (Survey Respondent)

Many respondents also emphasized that COPs must move beyond theoretical discussions to focus on the practical implementation of innovative silviculture. They expressed a desire for moving beyond the "why" of innovative silviculture and more directly to the "how", capitalizing on what was felt as positive momentum within the forestry community for alternative forestry practices. Respondents expressed a need for more trialing of applications, learning from those trials, and communicating those learnings.

> *"Much of the knowledge is retiring. The resources can be found but only if you know where to look and/or who to talk to to find it."*
> –Survey Respondent

SUGGESTION 3 | Increase Mentorship Opportunities

There was a strong signal for stronger mentorship opportunities across COPs. Broadly, respondents felt that more effective sharing of expertise between experienced and newer professionals was needed. Calls for more mentorship opportunities reflected the need to bridge the gap between experience levels.

"More hands-on approach to mentoring would be of the greatest benefit. All too often our most experienced members are office bound with little time spent in the field." (Survey Respondent)

Many respondents had significant concerns that expertise was growing more and more limited within the industry as the knowledge base ages out and experts retire. Respondents felt this barrier was especially challenging because of the overarching reliance on a peer-to-peer knowledge network to exchange knowledge.

"Much of the knowledge is retiring. The resources can be found but only if you know where to look and/or who to talk to to find it." (Survey Respondent)

Another late career respondent acknowledged that they felt they had a

responsibility to mentor and share knowledge with as many new forest professionals as possible before they had to retire.

"At this stage of my career of 40 yrs, my goal is to draw as many new forest professionals into the work that I do in an attempt to mentor and share knowledge. I am at the passing of a career of operations, field skill knowledge stage of life. I attempt to create a community of practice around me." (Survey Respondent)

There are many COPs that are well-suited to take on increasing mentorship opportunities given their network and access to experts and specialists. While recognizing the significant coordination needed to successfully carry out a mentorship program, there are aspects of mentorship and knowledge transfer that could be embodied by different COPs, such as facilitating opportunities for grouping early career professionals with late career professionals in breakout groups or at workshops.

SUGGESTION 4 | Support Early Career Foresters

Building on the need to enhance mentorship opportunities,there was also a clear call to consider how COPs can specifically support early career foresters. Early career respondents cited challenges navigating the breadth of the COP networks, often not even knowing where to look for dedicated groups, and the pressures to connect with experts to initiate discussions without knowing how to contact them or their scope of expertise. Early career foresters bring fresh perspectives and a readiness to embrace change, making them key drivers for advancing silvicultural practices. Providing dedicated resources, mentorship, and accessible learning opportunities will ensure they are equipped to lead and sustain innovation in the field.

"Sometimes [the COPs] feel very catered towards people who are already very knowledgeable about the subject. Would be nice if there were resources provided specifically for individuals earlier in their careers without the years of experience." (Survey Respondent)

SUGGESTION 5 | Break Down Silos, Build Diversity and Inclusion

A recurring theme is the need for broader and more diverse participation in the COPs, especially calling on the breaking down of silos between, and within, certain COPs. In many cases, respondents wanted better collaboration among industry professionals, government workers, and field-level forestry workers, as well as the inclusion of subject matter experts or specialists across multiple disciplines, such as soil ecologists and hydrologists. In other cases, respondents sought more diversity in the types of industry represented within the innovative silviculture space, particularly highlighting smaller tenure holders, "non-industrial" forests and even more surveyors. It was felt that more progress could be made at meetings if a culture of collaboration that fostered diverse silviculture experiences could be achieved.

We note that diversity amongst the COP network itself is also important. A diversity of COPs, including diversity in structure and membership, can ensure

> *"When thinking about innovative silviculture, folks involved at all stages of forest management must be involved in the communities to implement the outcomes."*
>
> –Survey Respondent

there is a reduction in barriers to access, such as the need to have a paid membership to an organization to gain benefits from a COP.

"Often, these groups tend to silo themselves over time, limiting the audience. When thinking about innovative silviculture, folks involved at all stages of forest management must be involved in the communities to implement the outcomes. The recent past has tended to exclude many of those not working in establishment silviculture, but I have seen interest growing from beyond as topics are doing the same." (Survey Respondent)

SUGGESTION 6 | Address Barriers to Accessing Communities of Practice

Respondents highlighted the need for more capacity - both financial and staff time. More financial support is needed to participate in COPs given the costs of conference fees, workshop fees, and/or field tour fees as they are a significant barrier that limits participation throughout the year. Resources that can help cover fees and time spent at COP gatherings would be highly beneficial to many respondents. Other respondents expressed time constraints as a barrier to accessing COPs, citing competing timing of gatherings and overall time required to meaningfully engage with their network of COPs. It was felt that more meetings may help open up opportunities to participate, as well as considering whether some meetings could be remote or provide an online component. Some respondents felt that a better understanding of the objectives and mandates of the COPs would help them determine which COPs are the most appropriate based on their current needs. COPs should consider having clear goals and objectives that are open and accessible to potential members to help facilitate engagement and new membership.

"[Conferences and proceedings] are time-consuming to attend for people who don't live in the communities." (Survey Respondent)

SUGGESTION 7 | Recognizing Barriers Beyond Communities of Practice

Finally, many respondents included comments on innovative silviculture more generally, describing perspectives on barriers and limitations to innovative silviculture that they felt permeated beyond what could be achieved through their COP. There was a sense that real or perceived barriers were preventing respondents from implementing learnings, even if the culture within the COPs themselves were positive and forward-thinking.

Many respondents described over-arching regulatory and policy barriers that they felt prevented or slowed the implementation of innovative forestry practices. For others, it was the shifting of perspectives of innovative silviculture, itself, that was needed. Respondents

> *"The need for change is apparent and noted by most professionals and organizations. We successfully implement trials, but large-scale change is not happening."*
>
> *–Survey Respondent*

PHOTO // (Gillian Chow-Fraser)

described a perceived unwillingness to adopt alternatives to clearcutting and comfort with sticking with the status quo from government, tenure holders and practitioners.

"The need for change is apparent and noted by most professionals and organizations. We successfully implement trials, but large-scale change is not happening." (Survey Respondent)

For some COPs, there might be an opportunity to help gain support for innovative silviculture, whether through educational materials, training, or knowledge creation to address perceptions of risk around economics, timber production, and/or regulatory requirements. The role of the COP in this space may be dictated by its scope and mandate, flexibility and access to decision-makers, and capacity.

HIGHLIGHT IDEAS

NO MORE BAD MEETINGS!

Survey respondents frequently described ways in which meetings could be improved, including:

- ☑ **Virtual knowledge sharing materials** that can supplement in-person meetings.
- ☑ **More field tours** and meetings that provide **practical real-world examples**.
- ☑ **Improve virtual options**, such as providing recorded seminars, investing in better technology to improve remote access to meetings, and improving meeting transcripts.
- ☑ Provide **more time at workshops for open discussion** amongst participants.
- ☑ Facilitate **time for discussions between operators and planners**.
- ☑ Provide **ways for participants to share resources** during the meeting and after the meeting.
- ☑ Consider supplementing one large annual meeting with **more frequent but less time intensive meetings**.
- ☑ Consider **using facilitators to ensure time spent at meetings is optimized**, whether during planning and organizing of the meetings or during the meetings themselves.
- ☑ **Lack of financial and institutional support is a common frustration**. Many respondents note that attending workshops, conferences, or even participating in COP activities can be difficult without financial backing or employer support.

A Framework for a Communities of Practice Network

Survey results demonstrate that there is a wide variety of COPs that are all important for supporting innovative silviculture. We also found a wide range of different types of COPs identified by practitioners, the spread in participation and engagement in those COPs, as well as the range in benefits and needs of practitioners from their COPs. To help understand how this network of COPs interact and how they might be enhanced, we propose a framework to help conceptualize the main features and types of COPs.

Building from the survey results, six different features of COPs were identified. The two most important features, intentionality and the flow of knowledge, demonstrate why a COP is gathering and how it deals with knowledge and information to help create the foundation for the form of COP it will be. The other four features (network

size, membership, reach, and limitations) are all dictated by the intentionality and flow of knowledge within the COP.

The main features of COPs include:

- **Intentionality:** Intentionality describes the reason that the COP is gathering - whether the COP is intentionally designed to provide learning benefits, or if the COP is an incidental benefit of other interactions. For example, learning about innovative silviculture might be the direct, expressed reason a community gathers, or, learning about innovative silviculture might be an indirect outcome of a group's broader mandate.

- **Knowledge Flow:** The degrees and directionality to which knowledge is created and/or transferred may vary across COPs. Knowledge may be created by the COP, meaning problem solving occurs by COP members and is supported by two-way exchanges of ideas, testing and implementation by members and the COP. Knowledge may also be primarily transferred to COP members in a one-way exchange, wherein information is delivered to members with limited opportunities to shape or inform the knowledge.

- **Network:** The structure of the COP can inform the size of the network that members belong to and how members are able to engage with each other.

- **Membership:** The membership of COPs can be made up of core members and peripheral members. Core members are those that are the most dedicated to the goals, activities and operations of the group, such as organizers or coordinators, as well as the most passionate members of the group. Core members may be the most involved in decision making and leading knowledge creation activities. Peripheral members are those that consume the information and knowledge that is created by the COP, but are not necessarily involved in the creation of the content.

- **Reach:** The reach of a COP is described as the extent to which knowledge is able to be disseminated to its members.

- **Limitations:** Limitations of different COPs describe the factors that may restrict the benefits and features of a COP.

In our conceptual framework, we suggest that COPs can exist on a spectrum of forms of engagement, depending on the intentionality and ways in which knowledge is shared (Westwood et al. 2021; Bamzai-Dodson et al 2021). This spectrum ranges from participatory, characterized by two-way knowledge and practice exchange and development, to informational, characterized by one-way dissemination of knowledge (Table 7).

Groups that are participatory are explicitly dedicated to the collaborative creation of knowledge to address questions and problems facing the community. Participatory groups may be more engaged in directly testing innovative approaches and co-creating solutions to challenges. These groups are highly collaborative and driven by field applications, in-field learnings, and dependent on access to, and

Table 7. A conceptual framework that identifies the different features and benefits that practitioners may yield from Communities of Practice along a spectrum of forms of engagement.

Feature	Participatory COP	Informational COP
Intentionality	The group gathers for the expressed purpose of discussing innovative silviculture, and actively creates space for dedicated and deep discussions that are recurring and evolving. The group initiates conversations around innovative silviculture.	The group supports discussions on innovative silviculture, but the discussions are often tangential to the primary focus of the group. The opportunities to learn about innovative silviculture may be less direct to the mandate of the organization and more opportunistic.
Knowledge Flow	The work of the group includes a focus on developing solutions to challenges facing the discipline, which may involve testing approaches and creating new knowledge. Knowledge exchange is more prevalent and is designed to be participatory, co-produced or anticipatory. The group can respond to requests from participants/members on areas of focus and extension activities.	The group focuses on disseminating existing knowledge. One-way knowledge transfer is effective in information delivery to large audiences.
Network	The group provides increased opportunities for direct peer-to-peer learning and training, as well as direct access to experts because of a smaller network.	The group provides more opportunities to access a wider network of peers and experts through exposure to the rest of the membership.
Membership	Tends to have more core members than peripheral members.	Tends to have more peripheral members than core members.
Reach	May have a smaller reach because of the narrow and intentional scope of its mandate.	May have a wider reach because the scope of its mandate enables a gathering of members under a broader common identity.
Limitations	The group's reach may be limited by the time and resources required to meaningfully and deeply engage on issues.	The group's mandate may limit the ability for the group to dedicate time and resources to support deeper innovative silviculture conversations and may limit peer-to-peer learning activities.

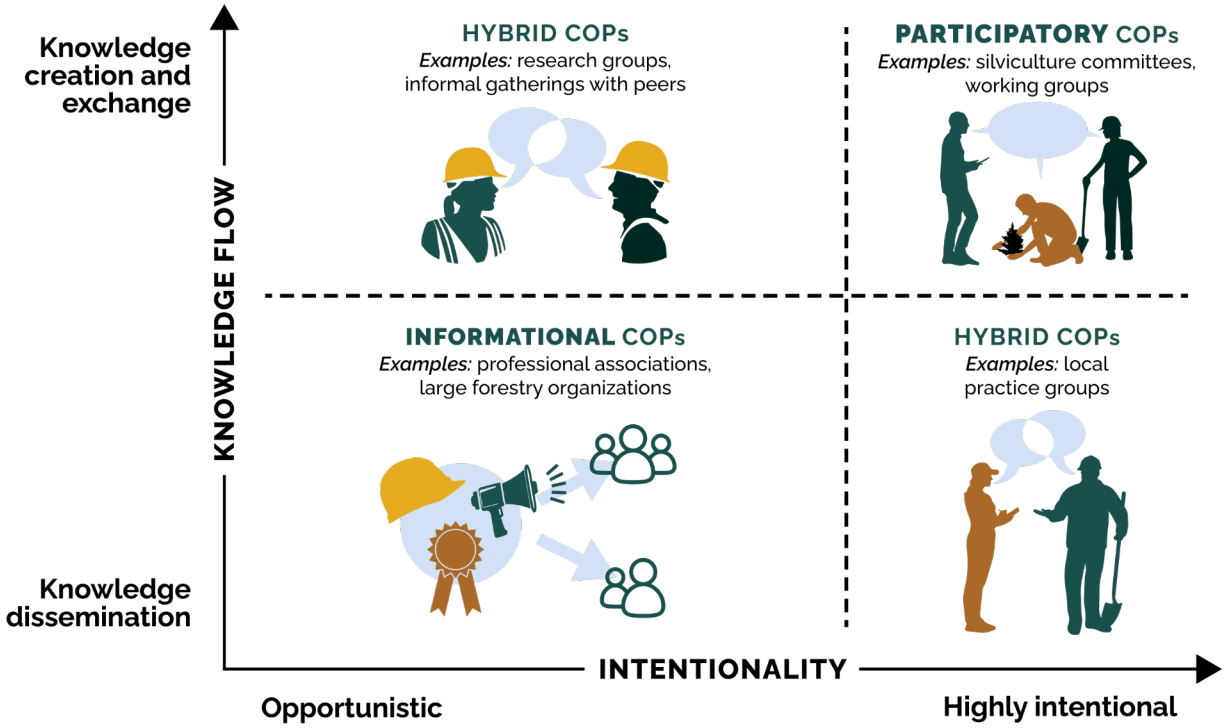

Figure 5. A conceptual framework that identifies the different features and benefits that practitioners may yield from Communities of Practice along a spectrum of direct engagement and intentionality.

collaboration with, experts. They are intentionally designed to create space for meaningful two-way discussions that are allowed to evolve and deepen with recurring meetings, gatherings or other opportunities to interact with peers. These groups may be smaller, and, over time, may be challenged with perceptions of feeling siloed, exclusive and disconnected from broader aspects of the work. Because of the time and resources required to support meaningful engagement and in-field learnings, participatory groups are often constrained in size and scope of work and require dedicated resources, both time and money, to maintain momentum and continue making progress.

"I am a member of the Coastal Silviculture Committee where we spend lots of time brainstorming ideas to support our professionals." (Survey Respondent)

Groups that are informational are able to effectively deliver information and knowledge to a broad membership, for example by providing resources and materials on issues and topics of innovative silviculture through publications, seminars, conferences and courses. These groups typically have mandates or purposes that are broader than innovative silviculture itself, but still provide the benefits of a COP by indirectly or opportunistically facilitating discussions on innovative silviculture through larger organizational processes. They are limited by their ability to provide deep peer-to-peer learnings and collaborations, but can still offer highly impactful opportunities for professionals to expand their knowledge and professional networks.

"The [COPs] have regular meetings and produce regular updates. Silviculture

practices are a common theme." (Survey Respondent)

Hybrid groups incorporate features from both participatory and informational COPs. For example, an informal group of peers that regularly meet to problem-solve and share knowledge might be opportunistic in their intention to meet and discuss issues, but highly productive in knowledge creation and exchange based on the expertise and experiences being shared by peers. In other cases, a group might be highly intentional in their gathering, like a local practice group that meets monthly, but focused primarily on disseminating information or knowledge. This might be the case, for example, if members of a local practice group are a part of different formal working groups, and they are meeting to deliver information from those respective working groups.

"My actual Community of Practice is a small band of dedicated forest professionals that I work closely with." (Survey Respondent)

And, finally, many of these COPs can be embedded within each other. An informational COP can enable the establishment of participatory COPs that are embedded within them. For example, an informational COP like a large member-based organization could support a participatory COP through an innovative silviculture working group made up of a subsection of interested members.

Applying the Framework to the Survey Results

Respondents valued many different kinds of benefits of their existing COPs, particularly those from informational COPs, including general exposure to the ideas of innovative silviculture and delivery of information about innovative silviculture. However, when respondents were asked about what they would change about their existing COPs, they described a desire to seek deeper and more meaningful discussions about specific applications of innovative silviculture at different scales, or, participatory groups. Respondents identified a need for their COPs to be more interactive and responsive to two-way knowledge sharing, such as seeking advice or collaborating on ideas. There was a desire to more actively train each other and new foresters through workshops and field tours.

"They are all just sort of giving information at certain times... but not really a source you can call up if you need information/advice." (Survey Respondent)

"Current COPs are good for disseminating knowledge but not as much for connecting people and practitioners with knowledge holders or experienced practitioners. I would like to see COPs incorporate a means to support a community where people and areas of expertise are provided; contact information is shared; and people feel comfortable reaching out to a leader in the area that they are interested in or have questions." (Survey Respondent)

All kinds of COPs are highly valued within our proposed network, as it is important to have a variety of COPs with different features to allow individuals to find one that suits their diverse needs. However, given the constraints that limit the breadth of work that informational groups can undertake, and the resource constraints of existing participatory groups, it is worth considering how

different groups can enhance or emulate various features to provide additional benefits to practitioners. In other words, considering how informational groups can take on features of participatory groups and vice versa is important. For example, informational groups can consider hosting and facilitating smaller focused working groups that can consistently meet specifically on the topic of innovative silviculture, bolstered by their network of expertise that could support answering questions and problem-solving issues. On the other hand, participatory groups may consider ways to enhance knowledge delivery to a broader audience by prioritizing external communications and the development of extension resources for a wider audience.

It is this diverse network of COPs that can create the knowledge and extension resources to continue to support practitioners in implementing innovative silviculture by creating space and amplifying the work of participatory, informational and hybrid COPs.

CURRENT STATE OF EXTENSION RESOURCES

A wide variety of extension resources currently support innovative silviculture, but there is a need to address knowledge and resource gaps, as well as provide more resources, for specific treatments and various management objectives. Currently, no formalized extension program exists in British Columbia to provide extension services to forestry practitioners, but COPs can play a role in guiding, creating and circulating extension resources to address the current needs of practitioners.

PHOTO // (Gillian Chow-Fraser)

Types of Extension Resources

Overall, the majority of survey respondents struggle to find information on innovative silviculture. Over half of the survey respondents disagreed with the statement "I can easily find all of the information I need to do innovative silviculture" (187 respondents, 55%, disagreed and 30 respondents, 9%, strongly disagreed) (Question 10). Fewer survey respondents agreed (115 respondents, 34%) or strongly agreed (8 respondents, 2%) that they can easily find information on innovative silviculture.

We assessed where respondents were receiving information from, or learning about, innovative silviculture practices to further understand the predominant modes of delivery of information (Question 11). Survey respondents indicated that they receive information

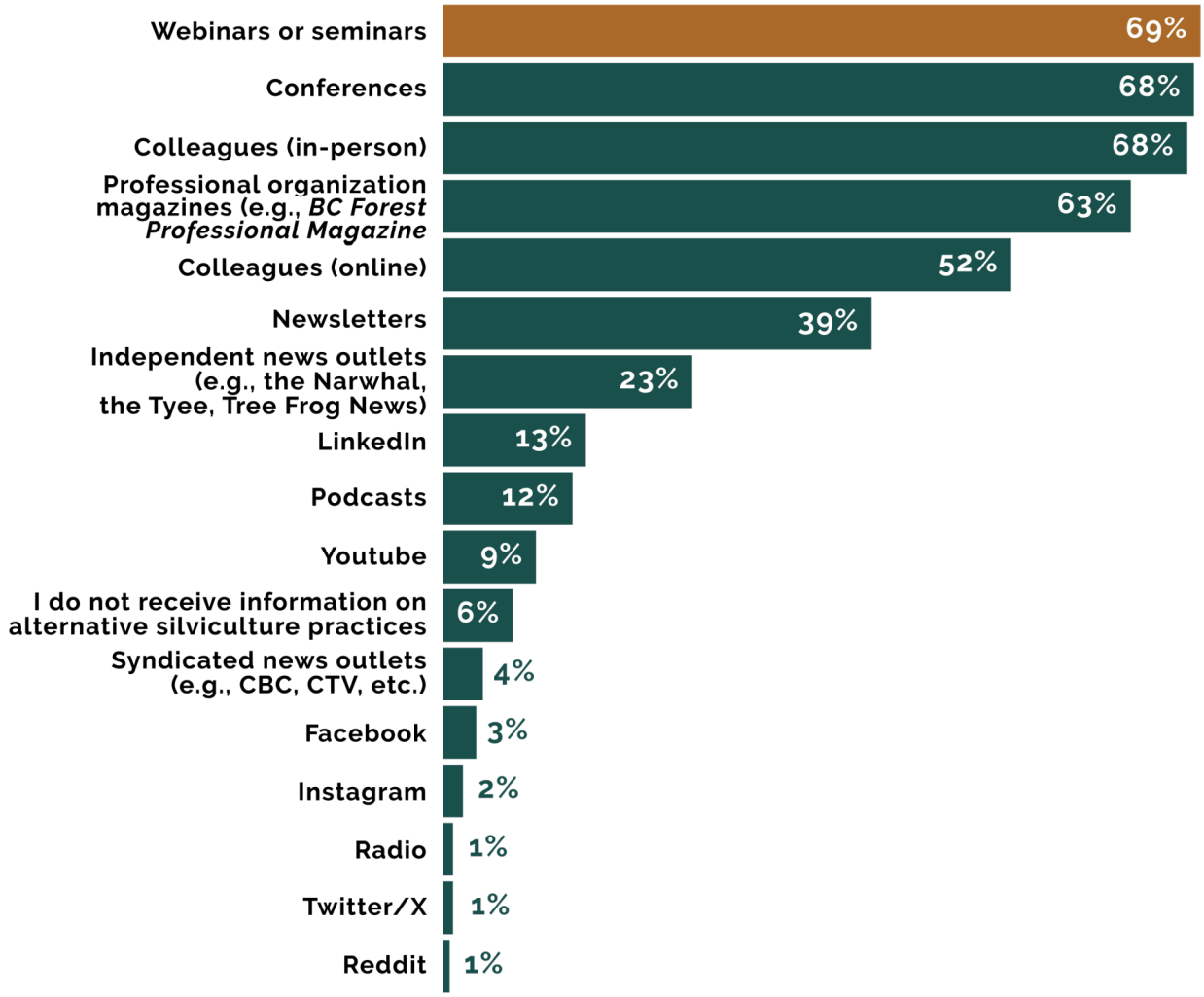

Figure 6. Sources of information used by survey respondents on innovative silviculture practices. The proportion of responses (percentage, %) of total survey respondents that selected a source of silviculture information is not mutually exclusive.

on innovative silvicultural approaches from various sources, with webinars or seminars being the most frequently cited (228 respondents, 69%), followed by conferences (226 respondents, 68%), in-person conversations with colleagues (224 respondents, 68%), and professional organization magazines (207 respondents, 63%) (Figure 6; Table 8 in Appendix). Six per cent of respondents stated they did not receive information on innovative silviculture at all (21 respondents, 6%).

Second, we assessed what types of extension resources were most helpful and applicable to respondents (Question 13). The most frequently cited resources that survey respondents used in the past year to inform their silviculture work include field tours (236 respondents, 71%), conferences (186 respondents, 59%), peer-reviewed literature (166 respondents, 50%), and one-on-one meetings with (subject-matter) experts or colleagues (162 respondents, 49%). Some respondents listed other additional resources (23 respondents, 7%) that they used in the past year to inform their work, which included resources such as on-the-job training, university courses, and government handbooks (Figure 7; Table 9 in Appendix).

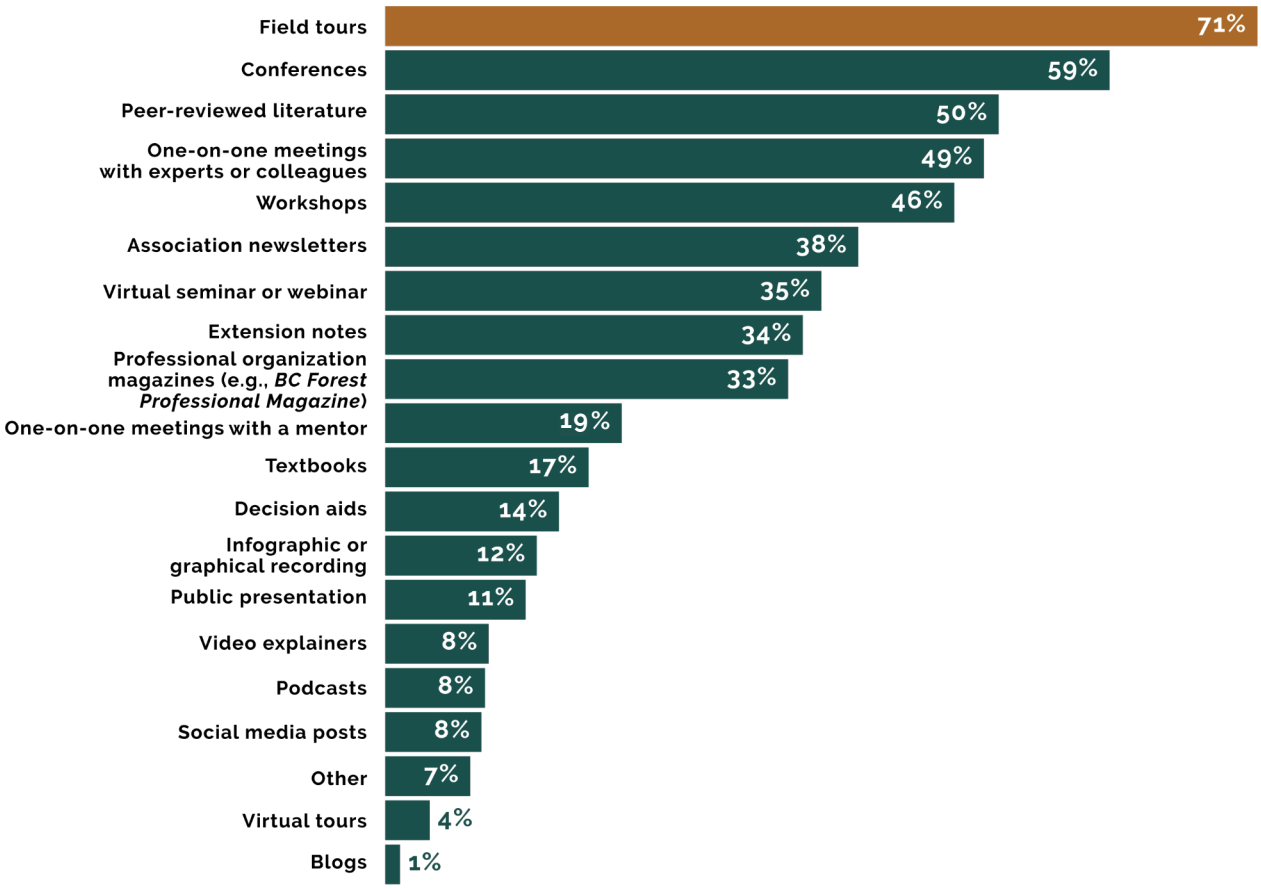

Figure 7. Resources that survey respondents indicated they used in the past year to inform their silviculture work. The proportion of responses (percentage, %) of total survey respondents that selected a resource is not mutually exclusive.

The Benefits of Extension

Respondents were asked why certain extension resources were most meaningful to them (Question 15) and one of the strongest features was whether the resource allowed for collaboration or interactions with peers and whether those opportunities were in-field. Respondents emphasized that collaborating with peers and participating in field tours best inform their innovative silviculture practices and decision making. This is primarily because these activities bring a variety of practitioners together to share ideas and knowledge, in addition to expanding networks for future collaborations.

"Connecting with mentors and coworkers with more local knowledge [is a resource that best informs innovative silviculture and decision making]. It helps to confirm ideas that could work and build my understanding of the area." (Survey Respondent)

"Local and field-based workshops help bring collaborators and stakeholders together to review innovative silviculture." (Survey Respondent)

"Talking to people one-on-one has always been the most valuable - it often leads to a whole web of new contacts to reach out to." (Survey Respondent)

Field tours, in particular, were some of the most requested extension activity, with respondents largely calling for far more field tours or opportunities to meet practitioners in the field and see real-world examples of innovative silviculture applications (Table 10). Respondents expressed a desire for more opportunities for hands-on learning to enhance their understanding and operational feasibility of different innovative techniques.

These views demonstrate the collaborative nature of innovative silviculture and the importance of building networks for effective knowledge exchange and informed decision making. It also demonstrates the importance of peer-to-peer knowledge transfer, mentorship and hands-on learning for practitioners. We note that this also further contextualizes concerns about a loss of knowledge as experts retire and reinforces the urgent need to prioritize and establish networks for early career foresters because so much learning and knowledge transfer in forestry occurs at a peer-to-peer level.

PHOTO // Alongside big cottonwoods near Kispiox, BC (Laura Stanton).

How to Enhance Extension Resources

Next, we identified how extension materials could be improved or enhanced by asking respondents what aspects of extension resources they value and what they need more of. Based on written responses to Question 16, we identify four key areas that extension resources can be better designed and developed to address practitioner needs and interests (Table 10):

1. Address Practical Knowledge Needs
2. Enhance Resources and Tools
3. Knowledge Transfer for Treatments
4. Knowledge Transfer for Multiple Values

IMPROVEMENT AREA 1 | Address Practical Knowledge Needs

When respondents use extension materials, there are key pieces of information that they are seeking and need more of, described here as a "knowledge need". The most frequently cited knowledge needs were: economics (72 respondents, 21%), implementation (60 respondents, 18%), and short and long-term results (42 respondents, 12%) (Table 10). These knowledge gaps further emphasize the importance of resources that describe the practical application of innovative silviculture (i.e., empirical case studies, guidelines, guidance documents, and treatment prescriptions) as they are resources that might be best suited to bridge these gaps. By providing detailed, real-world examples and clear, actionable guidance, these resources can help practitioners better understand the economic implications, practical steps for implementation, and the potential outcomes of innovative silviculture practices, ultimately leading to more informed decision making and more effective adoption of innovative silviculture.

IMPROVEMENT AREA 2 | Enhance Resources and Tools

Survey respondents also described nine different resources or tools they need more of to make informed decisions on innovative silviculture. The most frequently cited Resources and Tools need was for more empirical case studies (10 respondents, 46%) (Table 11). Respondents indicated that case studies are a critical tool that provides practitioners with practical knowledge and tangible results to make informed decisions and adapt their practices. Moreover, case studies were noted to be particularly valuable as they offer real-world examples, describe cost parameters, and address operational issues across various scales of operation which is information that is often lacking with respect to innovative silviculture. Case studies that are regionally informed can ultimately serve as "how to" documents for practitioners.

One survey respondent emphasized that tangible results from previous studies, such as those found in empirical case studies, aid in their discussions with

stakeholders regarding innovative silviculture operations:

"I need to see more field-based approaches that have occurred to provide examples to stakeholders and licensees. It would help seeing the modeling outputs along with the field-based silviculture operations to provide tangible results when needed during discussions with stakeholders" (Survey Respondent)

In addition to empirical case studies, respondents also cited guidelines and guidance documents (3 respondents, 14%), and treatment prescriptions (3 respondents, 14%) as a Resource and Tools need (Table 11). These resources can complement case studies by providing structured and detailed information on how to implement innovative practices effectively. Guidelines, guidance documents, and treatment prescriptions are valuable resources that can aid practitioners in understanding best practices and the step-by-step processes required to adapt innovative silviculture practices for specific situations and geographical areas.

IMPROVEMENT AREA 3 | Knowledge Transfer for Treatments

More broadly, respondents described a need for more extension resources that were designed to specifically increase knowledge transfer on particular innovative silvicultural treatments and practices. Respondents were most interested in learning about innovative silvicultural treatments such as species selection (7 respondents, 18%), thinning (7 respondents, 18%), harvesting (5 respondents, 13%), as well as more about machinery used to implement applications (5 respondents, 13%) (see Table 10).

IMPROVEMENT AREA 4 | Knowledge Transfer for Multiple Values

Similarly, respondents described a need for more extension resources for innovative silvicultural practices that managed for multiple values, or included details on non-timber values as management objectives. Respondents described a need to provide more technical information on multiple values, such as climate change resilience (16 respondents, 22%), wildfire risk (10 respondents, 14%), and hydrology (10 respondents, 14%) among others (see Table 10).

How to Enhance Access to Extension Materials

We identified sources of extension and how they are accessed could be improved upon or enhanced (Question 12). Survey respondents indicated several places where more information or resources on innovative silviculture is needed to improve practices.

The most significant need is for a centralized data hub or knowledge hub (30 respondents, 28%) to simplify and improve the accessibility of information on innovative silviculture. This suggests a strong demand for a single,

comprehensive source of information. A centralized data hub would be highly beneficial for accessing up-to-date resources and research, and increasing the availability and frequency of webinars to provide ongoing education and facilitate knowledge sharing.

An online repository of innovative silviculture information was also a strong outcome of the SIP Knowledge Summit (March 2023). The SIP team has been working to develop an online resource and information hub to support this exact need. The results of this survey, which reached a broader audience than the Knowledge Summit, is a firm reminder that access to knowledge is a key need for practitioners.

Other sources for information to improve upon include: government resources (18 respondents, 17%) as they provide authoritative and standardized guidelines, academic publications (11 respondents, 10%) to support evidence-based practices, and industry insights (9 respondents, 8%) in order to receive information from industry leaders and practitioners that could offer practical, real-world applications. By increasing extension and communication from these sources, practitioners feel they will be more knowledgeable on how to implement innovative silviculture.

Table 10. Knowledge gaps, resources and tools gaps, information on treatments, and information on multiple values that respondents outlined they are most interested in learning about and what aspects can help inform decision making with respect to innovative silviculture. Features were not mutually exclusive.

Improvement Area 1: Address Practical Knowledge Needs

Description: *Responses describe a specific practical or applied knowledge need that practitioners face when learning about and making informed decisions on innovative silviculture.*

Features	Number of Responses	Percentage (%)
Economics/cost Benefits	72	69
Implementation	60	68
Results (short- and long-term)	42	68
Treatment Logistics	33	63
Effectiveness of Treatment	31	52
Monitoring Plan Details	20	39
Policy Guidance	19	23
Management	18	13
Communication	16	12
Collaboration	12	9
Region-specific Resources	8	4
Growth and Yield	5	3
Indigenous Knowledge	3	2
Training	2	1
Total	**341**	

Improvement Area 2: Enhance Resources and Tools

Description: *Responses describe a specific resource or tool that is needed to support decision-making on innovative silviculture.*

Features	Number of Responses	Percentage (%)
Empirical Case Studies	10	46
Guidelines and Guidance Documents	3	14
Treatment Prescription	3	14
Operational Project Report	1	5
Peer-Reviewed Literature	1	5
Pilot Projects	1	5
Extension Notes	1	5
Visual Media	1	5
Webinars	1	5
Total	**22**	

(Table 10 continued on reverse)

PHOTO // **Silviculture surveying after the Nadina Wildfire, south of Houston, BC** (Laura Stanton)

(Table 10 continued from previous page)

Improvement Area 3: Knowledge Transfer on Treatments

Description: *Responses describe a specific treatment or practice that practitioners need more of to make informed decisions on innovative silviculture.*

Features	Number of Responses	Percentage (%)
Climate Change Resilience	7	18
Fire Risk	7	18
Hydrology	5	13
Ecosystem Health	5	13
Timber	4	10
Wildlife	3	8
Forest Health	3	8
Carbon	2	5
Culture	1	3
Total	**39**	

Improvement Area 4: Knowledge Transfer on Treatments

Description: *Responses describe a specific treatment or practice that practitioners need more of to make informed decisions on innovative silviculture.*

Features	Number of Responses	Percentage (%)
Species Selection	7	18
Thinning	7	18
Harvesting	5	13
Machinery	5	13
Partial Harvest	4	10
Retention	3	8
Seedlot Selection	3	8
Reforestation	2	5
Brushing	1	3
Establishing Species	1	3
Fertilization	1	3
Total	**39**	

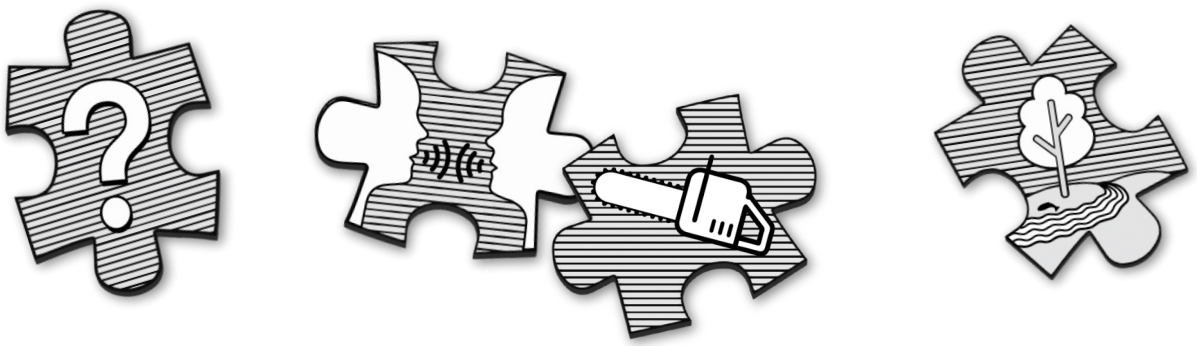

PHOTO // **Multiple values: mountain bikers ride a cross-country bike trail in a community forest cutblock close to Smithers, BC** (Laura Stanton)

Recommended Areas of Focus for Extension

Finally, respondents were asked to detail one area of focus for extension support that would help them implement innovative silviculture (Question 17). Overall, we recommend progress made on any of these areas of focus would help practitioners feel supported in implementing innovative silviculture.

EXTENSION FOCUS 1 | KNOWLEDGE GAPS

Economic and Cost Benefits

Survey respondents identified several key knowledge gaps related to the implementation of innovative silviculture practices. One of the most frequently mentioned knowledge gaps is understanding the economic and cost benefits of implementing innovative silviculture practices. Many respondents emphasized the importance of knowing the cost implications and effectiveness of these innovative practices, as this knowledge is critical to their ability and interest in adopting them. Additionally, there is a strong interest in learning about new or existing funding opportunities to help offset the costs of innovative treatments. Some respondents also expressed a desire to understand the potential revenue that could be generated from products using these practices.

"I need to be able to "prove" to my employer that innovative silviculture can be cost effective in the long run." (Survey Respondent)

"We need a way to put a value on each aspect of forestry so one can weigh the pros and cons before making a decision." (Survey Respondent)

Implementation

Another major knowledge gap mentioned by the survey respondents is the implementation of innovative silviculture practices. Respondents highlighted the need for more

PHOTO // Mountain Pine Beetle damaged stand (Laura Stanton)

information on how to practically apply these practices in their own activities and geographical areas. They also expressed a desire to learn about the specific challenges associated with implementation to avoid similar mistakes and understand which techniques can be successfully used in operations.

"[I need] training for operators in how to implement alternative silvicultural regimes. The foresters know what they want, but we often don't know how to get that result from the operators." (Survey Respondent)

"[Understanding the] implementation challenges and learnings can prevent similar challenges or mistakes." (Survey Respondent)

Regional Concerns

Regional concerns and risks were also noted by respondents. There is a need to understand the roles and interactions of ecosystems, particularly in relation to Biogeoclimatic Ecosystem Classification (BEC) zones and site series, and how these ecosystems respond to treatments. Specific regions and ecosystems mentioned include the Coast, Central Region, Southern Interior, Interior Cedar Hemlock, North, and dry Douglas-fir.

Results and Effectiveness of Treatments

Respondents also highlighted the importance of understanding the short and long-term results of innovative silviculture practices and the importance of continued monitoring to measure such results. Access to tangible results is seen as crucial for engaging in meaningful discussions with stakeholders and for identifying opportunities for improvement. Understanding these outcomes is also essential for developing effective long-term monitoring strategies and adapting prescriptions to fit within land-base objectives and regulations.

"Understanding how the activity was monitored (and adapted, if necessary) can ensure a strong and effective monitoring approach for future treatments." (Survey Respondent)

Finally, there is a need to understand the effectiveness of past treatments and how to create effective prescriptions based on previous learnings. Respondents expressed interest in knowing whether past treatments met planning objectives and what those objectives were. They also want to be aware of the options, risks, and mitigation strategies

> *"I would love to just see what others are doing to know what is possible in the area."*
> –Survey Respondent

associated with creating effective prescriptions. The definition of effectiveness varied among respondents, including improved survivability rates, impacts on future timber supply, enhanced non-timber values, whole-ecosystem health and functionality, ease of implementation, and ease of translation to existing equipment.

"Silviculture treatments play out over long time scales so being able to see past results is very useful in determining whether or not a treatment will be suitable." (Survey Respondent)

EXTENSION FOCUS 2 | RESOURCES & TOOLS GAP

Empirical Case Studies

Respondents identified several resource gaps that are crucial for the successful implementation of innovative silviculture practices. One significant gap is the lack of empirical case studies. Respondents emphasized the importance of reviewing real-world examples to make informed decisions and adapt their practices accordingly. They noted that many innovative practices lack sufficient replicates to demonstrate their success, describe cost parameters, or address operational issues at various scales. Additionally, respondents expressed the need for guidance on best practices, policy guidance, prescriptive decision-making keys, step-by-step guidance, and actual prescriptions or work plans.

Resources such as these would provide practical knowledge and tangible results, which are essential for understanding the effectiveness and feasibility of innovative silviculture practices.

"So many innovative practices have few replicates to demonstrate success for objectives, or to describe cost parameters, or operational issues that apply at various scales of operation." (Survey Respondent)

Information Access

Another critical resource gap is information access. Respondents expressed a strong desire for a centralized way to access information, research, and knowledge on innovative silviculture. Suggestions included creating a comprehensive website that lists different strategies, tactics, and practices, as well as a presentation of activities that are currently occurring or have previously occurred. There were also requests for access to research forests, adaptive management areas, universities, and provincial government resources.

"I would love to just see what others are doing. To know that it's possible in the area [I am working on]." (Survey Respondent)

"[We need] a comprehensive listing/ presentation of activities that are currently occurring, or have previously occurred. This would help address the perception that "we can't do _____"." (Survey Respondent)

Communication

The exchange of knowledge within forestry relies heavily on communication with peers to understand, teach, and apply innovative silviculture effectively. This is confirmed by survey responses outlining that learning from peers,

PHOTO // A brushy stand near Pink Mountain, BC (Laura Stanton)

experts, and field tours were sources for information that respondents used most frequently in the past year to inform their work. Although peer-to-peer learning is a key practice in the forestry sector, access to information can be limited and relies on professional networks. As such, communication was also highlighted as a significant resource gap. Respondents also expressed the need for knowledge transfer across different audiences, including peers, industries, decision-makers, ground operators, university researchers, the Ministry of Forests, and the public. Respondents shared that a centralized location for all related silviculture knowledge can help overcome inaccessible or poor communication which limits practitioners' ability to learn from past mistakes, see the tangible benefits of innovative silviculture, and address misconceptions.

"[We need more] innovative silviculture practices feedback from on-the-ground operators and from large licensees to build more knowledge." (Survey Respondent)

"[We need more] collaborative field tours with ministry, industry and First Nations to discuss innovative silviculture practices." (Survey Respondent)

EXTENSION FOCUS 3 | TREATMENT SUPPORT NEEDS

Tree Species Selection

One of the most frequently mentioned treatments that survey respondents want to learn more about through additional extension resources is tree species selection or alternate tree selection. Respondents expressed a strong desire to

learn more about this treatment to aid in decision-making processes and adapt innovative silviculture practices to different environments and objectives.

Commercial Thinning

Commercial thinning was another treatment frequently mentioned by respondents that they are interested in learning more about and believe requires additional extension support. Respondents expressed that practical examples of commercial thinning applications can help with decision making and they highlighted regional knowledge gaps with respect to commercial thinning, specifically requesting for examples in the southern interior, coast, and northern regions.

Partial Harvests

With respect to partial harvest treatments, respondents shared that they are most interested in understanding how partial harvests can help meet various outcomes and values such as wildfire risk reduction, climate change resilience, supporting wildlife habitats, and the preservation of cultural plants. Respondents expressed a need for more technical information to help plan partial harvests that consider multiple values and the use of different treatments throughout the full rotation of stand management.

EXTENSION FOCUS 4 | MULTIPLE VALUES

Climate Change Resilience

In addition to specific treatments, respondents expressed a strong interest in understanding how climate change impacts silviculture practices, what adaptations are necessary, and how to increase resiliency. They emphasized the importance of creating stands that provide diverse benefits, enhance ecosystem health, and support wildlife species. Respondents also highlighted the need for guidance on developing prescriptions, including assisted migration, species selection, planting densities, and stand dynamics to manage factors like tree growth, mortality, and heat stress and understand how this will impact management objectives. This interest in climate change resilience demonstrates the need for practical knowledge and tangible results to implement innovative practices, as highlighted in the knowledge and resource gaps above.

"Outcomes and details are key. Moving forward [I want to learn more] on innovative silviculture treatments especially associated with changes in climate and wildfire hazard mitigation and reduction measures." (Survey Respondent)

Wildfire Risk

Wildfire risk is another value respondents expressed they would like to better understand how to manage for or require additional extension products. Specifically, respondents are interested in reforestation opportunities and challenges post-wildfire and how innovative silviculture can aid in wildfire risk reduction. Respondents expressed they want to understand how different practices impact wildfire risk and what considerations are necessary pre- and post-wildfire.

Hydrology

Respondents expressed the need for additional information or extension products for hydrology with a focus on drought management and drought-

resistant planting strategies. Specifically, respondents shared an interest in learning how to maintain hydrological function using innovative silviculture practices.

NEXT STEPS

The findings from the survey provide a comprehensive understanding of the role COPs play in implementing innovative silviculture and offer clear guidance on how to enhance their support for practitioners. The SIP will use the survey findings to inform our own extension work by shaping how we support and provide resources. The survey results suggest key next steps should focus on:

- Creating resources that increase awareness of COPs that support innovative silviculture so practitioners can easily connect to COPs.
- Work closely with COPs to help diversify their features and benefits, ensuring they can meet the varied needs of practitioners.
- Supporting more participatory activities, such as field tours and workshops, to provide hands-on learning opportunities and foster practical knowledge exchange.
- Better emulating the peer-to-peer knowledge transfer that is so crucial in forestry by developing resources that capture and disseminate practical insights and experiences from the field.
- Facilitating easier connections between practitioners and knowledge holders and supporting meaningful knowledge exchange.

COPs are essential for advancing innovative silviculture and, with continued support, can further strengthen knowledge sharing and exchange across the province.

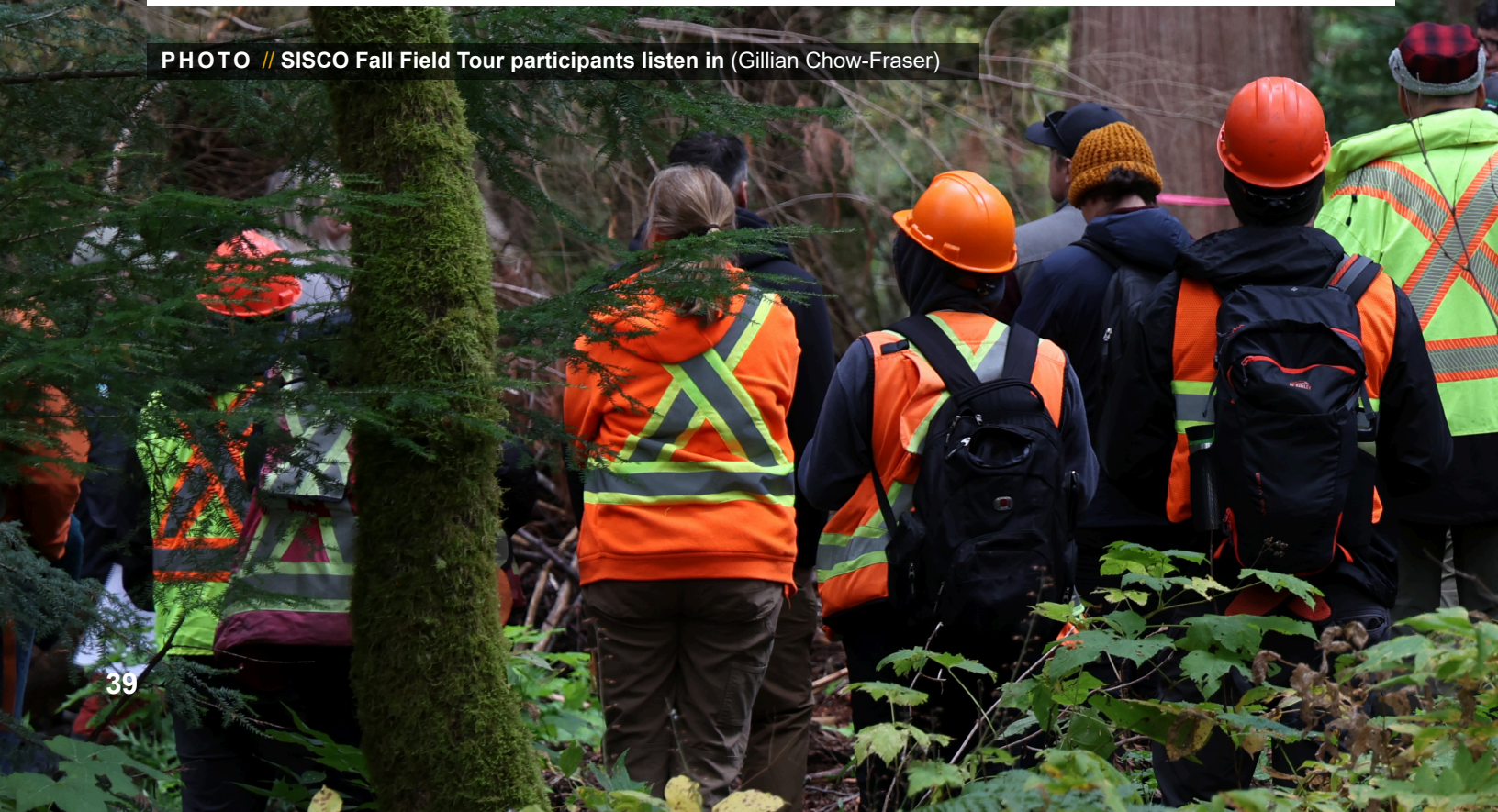

PHOTO // SISCO Fall Field Tour participants listen in (Gillian Chow-Fraser)

APPENDIX 1: Tables

Table 8. Sources of information used by survey respondents on innovative silviculture practices. The proportion of responses (percentage, %) of total survey respondents that selected a source of silviculture information is not mutually exclusive.

Source of Silviculture Information	Number of Responses	Percentage (%)
Webinars or seminars	228	69
Conferences	226	68
Colleagues (in-person)	224	68
Professional organization magazines (e.g. BC Forest Professionals Magazine)	207	63
Colleagues (online)	171	52
Newsletters	129	39
Independent news outlets (e.g., The Narwhal, The Tyee, Tree Frog News)	75	23
LinkedIn	43	13
Podcasts	39	12
Youtube	28	9
Syndicated news outlets (e.g., CBC, CTV, etc.)	12	4
Facebook	10	3
Instagram	6	2
Radio	3	1
Twitter/X	3	1
Reddit	2	1
I do not receive information on innovative silviculture	21	6
Total	**331** (1427)	

Table 9. Resources that survey respondents indicated they used in the past year to inform their silviculture work. The proportion of responses (percentage, %) of total survey respondents that selected a

Resource	Number of Responses	Percentage (%)
Field tours	236	71
Conferences	196	59
Peer-reviewed literature	166	50
One-on-one meetings with experts or colleagues	192	49
Workshops	154	46
Association newsletters	128	38
Virtual seminar or webinar	118	35
Extension notes	113	34
Professional association magazines (e.g., BC Forest Professional Magazine)	109	33
One-on-one meetings with a mentor	64	19
Textbooks	55	17
Decision aids	47	14
Infographic or graphical recording	41	12
Public presentation	38	11
Video explainers	28	8
Podcasts	27	8
Social media posts	26	8
Other	23	7
Virtual tours	12	4
Blogs	4	1
Total	**333** (1747)	

APPENDIX 2: Survey Questions

SIP Community of Practice Survey

Introduction

Whether you work in forestry management and operations, wildfire, or silviculture spaces, we want to understand how Communities of Practice support you to carry out, or inform the application of, innovative silviculture. The term "innovative silviculture" encompasses systems for the harvesting, growing and tending of forests where the primary objective is to achieve holistic stewardship of the land base and manage for multiple values beyond solely timber, such as wildfire, wildlife habitat, and cultural values. It is sometimes also called "alternative silviculture".

The survey will also help us learn how you can be better supported in your work. The survey should take about 15 minutes to complete.

* 1. What group most closely matches your affiliation?

* 2. In what region(s) do you primarily work? Check all that apply.

- [ ] Northeast
- [ ] Northwest
- [ ] Southeast
- [ ] Southwest
- [ ] Central Interior
- [ ] Coast
- [ ] I work at a provincial scale
- [ ] I work at a federal scale
- [ ] I work within my Nation's territory (You are welcome to add name in "Other" below)
- [ ] Other (please specify)

* 3. How familiar are you with the innovative silviculture space?

- ◯ Extremely familiar (I've planned multiple prescriptions, implemented multiple treatments, and/or I teach others about it)
- ◯ Very familiar (I've planned a prescription and/or I've implemented a treatment)
- ◯ Somewhat familiar (I've helped plan and/or implement innovative approaches but not led them)
- ◯ Not so familiar (I'm still learning about innovative silviculture and thinking about how to implement it)
- ◯ Not at all familiar (This is a new topic to me)

SIP Community of Practice Survey

Your Experience with Communities of Practice

We want to know about your experience with communities of practice that support your work in innovative silviculture.

A community of practice refers to a group of people who share a common interest or profession and engage in collective learning and knowledge-sharing. Members of a community of practice come together to collaborate and deepen their understanding of a particular area of interest, which might include sharing of skills, techniques, insights, and new approaches. Some examples of communities of practice include the regional silvicultural committees, professional designations, provincial forestry associations, working groups, local clubs, non-profit memberships, and more.

4. What communities of Practice are you part of that support your work on innovative silviculture (or alternative silviculture)?

- ☐ Southern Interior Silviculture Committee
- ☐ Northern Silviculture Committee
- ☐ Coastal Silviculture Committee
- ☐ Forest Professionals BC
- ☐ Woodlots BC
- ☐ BC Community Forest Association
- ☐ Prescribed Burn Association
- ☐ BC Professional Firefighters Association
- ☐ BC Wildlife Federation
- ☐ Truck Loggers Association
- ☐ The Fire Chief's Association of BC
- ☐ BC Summit of First Nations
- ☐ First Nations Forestry Council
- ☐ Forest Enhancement Society of BC
- ☐ Western Forestry Contractors Association
- ☐ Canadian Institute of Forestry - BC

Other (please specify)

* 5. On a scale of one (1) to four (4), how much do you agree with the statement: "I feel supported by my communities of practice to help me carry out or support the application of innovative silviculture (or "alternative" silviculture)."

Strongly Disagree	Disagree	Agree	Strongly Agree
○	○	○	○

6. Building on your previous answer, tell us how your existing communities of practice do or do not support your work on innovative silviculture. Are there areas where communities of practice could be enhanced or adapted to better support the uptake of innovative silviculture?

* 7. We know the average forester has a packed schedule and only so many hours in the day, and this means you might be prudent about which Communities of Practice (CoP) you devote your time and energy into. When choosing to engage your Communities of Practice, what are the driving motivators that decide which Community of Practice gets your attention?

Pleaserank the options below from most to least relevant driver.

Target audience (e.g. the most similar types of workers and position or role, such as planners, operators, biologists, silviculturists etc.)

Ability to grow in your career (e.g., achieve credentials or certificates, or gain professional status/liability protection)

* 8. In general, when engaging with a community of practice, what are the aspects that you prioritize? Pleaserank the following options from the one you prioritize the most to the least.

9. If you could change one thing about your current Communities of Practice, what would it be?

SIP Community of Practice Survey

Your Experience with Extension Resources & Activities

Tell us about your experience with extension products.

The term "extension" might be new to you! Here's the scoop: you are likely already familiar with extension products - and might even do extension without knowing the name. In practice, extension is about building relationships and capacity for collaboration and co-creation of work that might inform the implementation of site plans, landscape planning, community decision-making and even policy transformation. When it comes to knowledge dissemination, extension actively reframes, translates, and mobilizes knowledge depending on different audiences and contexts. Some examples of extension activities include attending or convening workshops, joint training sessions, creating course curriculum, supporting land based learning and communicating outcomes.

* 10. On a scale of one (1) to four (4), how much do you agree with the statement: "I can easily find all of the information I need to do innovative silviculture."

Strongly Disagree	Disagree	Agree	Strongly Agree
◯	◯	◯	◯

11. How do you receive information on alternative silvicultural approaches? Or, where are the places you hear and learn about innovative silviculture? Check all that apply.

- [ ] Newsletters
- [ ] Colleagues (online)
- [ ] Colleagues (in person)
- [ ] Conferences
- [ ] Professional organization magazines (e.g., BC Forest Professional Magazine)
- [ ] Webinars or seminars
- [ ] Podcasts
- [ ] Radio
- [ ] LinkedIn
- [ ] Instagram
- [ ] Facebook
- [ ] Twitter/X
- [ ] Bluesky
- [ ] Reddit
- [ ] Youtube
- [ ] Independent news outlets (e.g.: the Narwhal, the Tyee, Tree Frog News)
- [ ] Syndicated news outlets (e.g.: CBC, CTV etc)
- [ ] I do not receive information on alternative silviculture

Other (please specify)

12. Are there places you wish you received more information on innovative silviculture? Are there places where you feel information or resources on innovative silviculture is lacking and it would be beneficial to improve?

13. What types of extension products or activities have you used in the last year to help inform your work? Check all that apply.

- [ ] Peer-reviewed paper
- [ ] Textbook
- [ ] Association newsletters
- [ ] Extension Note
- [ ] Decision Aid
- [ ] Infographic or graphical recording
- [ ] Field tours
- [ ] Blogs
- [ ] Magazine article
- [ ] Video explainers
- [ ] Virtual tour
- [ ] Virtual seminar or webinar
- [ ] Conference
- [ ] Workshop
- [ ] Public Presentation
- [ ] Social media post
- [ ] One-on-onemeeting with an expert or colleague
- [ ] One-on-onemeeting with a mentor
- [ ] Podcasts
- [ ] Other (please specify)

14. Are there extension products or activities that you wish you received more of, or that you feel could be improved to help inform application of innovative silviculture?

SIP Community of Practice Survey

Your Extension Needs (A Deeper Dive)

Tell us about your needs when it comes to extension in a few longer form answers. Help us learn more about the ways you use extension resources and what can make them impactful.

* 15. Tell us about the most meaningful resources you've used that have informed your work on innovative silviculture. What was the resource and how did it help your decision making?

* 16. When learning about innovative silviculture that has been carried out, what aspects are you the most interested in learning? What are the aspects of the work that you need to know, in order for it to inform your own decision-making? This could include aspects such as treatment logistics, cost estimates, monitoring plan details, challenges in implementation or details on the values being managed and how. Please provide as much detail as possible.

* 17. What is one topic that you think needs more extension support, when it comes to implementing innovative silviculture? Please be as specific as possible, which could include your region of focus, technique of focus, or specific challenge you are facing in your forest.

SIP Community of Practice Survey

Before You Go...

Please consider joining our newsletter mailing lists to receive further information regarding our work and be the first to learn of new opportunities for engagement, new resources, and news on innovative silviculture.

18. Please submit your email contact to be eligible for our raffle prizes. You will not be contacted regarding the survey, unless you are a selected prize winner.

Email address example@website.com

* 19. Would you like to be added to the Silviculture Innovative Program newsletter mailing list?

- [ ] Yes
- [ ] No

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