

Annual Report 2017/18



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Main cover photo: Scott King, RPF, near Golden BC

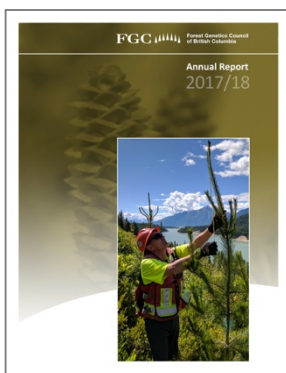


Photo: Brian Barber

Scott King, RPF, Forester, Louisiana-Pacific Corp, Golden, and member of the Forest Genetics Council, measuring the leader of a lodgepole pine tree at an Assisted Migration and Adaptation Trial (AMAT) test site planted in 2012 north of Golden.

AMAT (EP139.41) is an extensive forest genecology study established by the BC Ministry of Forests to better understand the growth and health of tree seed collected from a variety of sources when planted across a range of climates and latitudes. This trial was established over four years on 48 sites in BC, Yukon, Washington, Oregon and N. California, and includes 15 species and 48 seed sources from BC seed orchards and wild provenances. Results will be used to inform tree seed transfer standards in a changing climate.

Message from the Provincial Chief Forester

I am pleased to introduce the 17th annual report of the Forest Genetics Council (FGC) for the fiscal year 2017/18. FGC is mandated to coordinate activities that enhance the value, resilience and conservation of BC's forest genetic resources. FGC and its committees include representatives from governments, the private sector and academia. I am grateful to the organizations and people who continue to support this collaborative model.

In September 2017, I introduced an interim policy which allowed foresters to use a new, science-based approach to select seed that is climatically-suitable for reforestation. In the coming years, knowledge and use of climate-based seed transfer (CBST) will increase. The input and assistance provided by FGC and committee members in developing this policy was most appreciated, and their on-going involvement is essential for the successful implementation of CBST

FGC will play an important role in coordinating the establishment of new seed orchards to serve CBST-based seed planning zones and providing advice on seed supply and demand, especially in areas impacted by wildfires and other disturbances.

I would like to thank Domenico Iannidinardo for volunteering his time as FGC's new Industry Co-chair, replacing Mark Tamas in June 2017. In addition, I thank Mark and all those who have served on FGC and its technical committees over the years. Our forests are more valuable and resilient thanks to you.



DIANE NICHOLLS RPF
Assistant Deputy Minister,
and Chief Forester,
Ministry of Forests, Lands,
Natural Resource Operations and
Rural Development

Message from Forest Genetics Council's Co-Chairs

During the fiscal year covered by this annual report, FGC updated its governance and business planning model. These changes (described within) are intended to reduce the workload of committee members and streamline processes. To-date, responses to the new framework have been positive, and further refinements are possible.

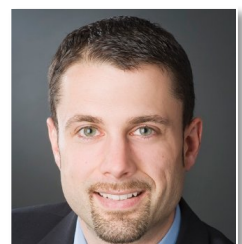
This year's progress towards FGC's five performance measures was mostly positive. Select seed use as a percent of total was down from the previous year due, in part, to one of the smallest seed orchard crops on record (see p. 13). However, FGC's target for genetic gain - average of 20% by 2020 - was met. Also, metrics on progress towards FGC's CBST implementation and forest health (pest resistant seed use) objectives are reported here for the first time.

Areas of focus for FGC include CBST implementation, examination of seed supply and demand, and increasing lodgepole pine seed orchard capacity. These initiatives are complex and require supporting technical analysis and thoughtful discussions. Fortunately, our community has many dedicated and resourceful people capable of tackling these challenges. Sadly, we also lost a few colleagues in 2017/18 (See Memorials).

Finally, we'd like to extend our appreciation to FGC and its committee members for their contributions and hard work, and to Brian Barber, FGC Program Manager, for supporting us and compiling this report



PAT MARTIN RPF
Director, Forest Improvement
and Research Management
Branch, Ministry of Forests,
Lands, Natural Resource
Operations and Rural
Development



DOMENICO IANNIDINARDO
RPF, PEng RPBio,
VP Forest & Sustainability,
and Chief Forester,
Mosaic Forest Management

FGC's mandate is to enhance the conservation, resilience and value of BC's forests

1.0 Introduction

This annual report provides an overview of the Forest Genetics Council of BC (FGC) and progress towards its goals and performance measures. It also includes summaries of budget allocations and expenditures, provincial tree seed use, and BC's seed orchards.

This year's features include memorials to colleagues who passed away this past year, and a report on FGC's field trip to Quesnel in October 2017.

1.1 Forest Genetics Council of BC

The FGC is a multi-stakeholder advisory group appointed by the Provincial Chief Forester. FGC includes representatives from the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (Ministry), forest tenure holders, universities, and the Canadian Forest Service.

FGC's mandate is to enhance the conservation, resilience and value of BC's forests. FGC establishes goals, objectives and performance measures; coordinates activities; and provides advice to the Ministry regarding policies, practices, and the allocation of funds to research and operations.

FGC's vision, goals and objectives are described in its 2015-2020 Strategic Plan. This plan guides FGC's priorities, programs, and annual business plans. Three technical advisory committees (TACs) also assist FGC in preparing its business plan by reviewing project proposals and budgets and providing advice.

For more information about FGC, visit www.fgcouncil.ca



Forest Genetics Council 2017/18

L to R: Domenico Iannidinardo, Kori Vernier, Brian Barber, Joe Leblanc, Annette van Niejenhuis, Mark Hay, Gernot Zemanek, Tony Hopkin, Mark Tamas, Pat Martin, Dan Peterson, Scott King.

Missing: Jeff Mycock, Rob Guy, Shane Ford

Pacific Forestry Centre, Victoria – March 2018

Vision

BC's forest genetic resources are diverse, resilient, and managed to provide multiple values for the benefit of present and future generations.

Goals of Genetic Resource Management (GRM)

- **Conservation** – the maintenance of natural levels of genetic diversity for all tree species indigenous to BC.
- **Resilience** – matching seed (genotypes) to planted sites (environments) and maintaining natural genetic diversity in planted populations of trees.
- **Value** – increasing the timber and non-timber economic value of planted forests

1.2 New Governance and Business Planning Model

In 2017, FGC undertook a review to align its programs with its goals, reduce the number of its technical advisory committees, and streamline business planning processes, while maintaining stakeholder interest and engagement.

The model in Figure 1 was recommended by a streamlining committee and adopted by FGC in October 2018. The number of technical advisory committees (TAC) was reduced to three: Genetic Conservation, Coastal and Interior.

The number of programs was also reduced to four: Conservation; Resilience (genecology, climate-based seed transfer, decision-support); Tree Breeding (for volume, pest resistance and wood quality) and Operational Tree Improvement Program (OTIP), which now includes coast and interior seed orchard, and cone and seed pest management activities. The new model was implemented for 2017/18 reporting and 2018/19 business planning.



FGC Streamlining Committee
L-R: Dan Peterson, Margot Spence, Annette van Niejenhuis, Pat Martin, Darrell Wood, and Brian Barber

Process	FGC Strategic Plan 2015-2020				
Goals	Conservation	Resilience	Value		
Objective # and Performance Measure	1. Adequately conserve genetic diversity of all tree species...	2. By 2020 selection and transfer of all tree seed guided by CBST	3. Increase select seed use to 75% of total sown by 2020	4. Increase avg. genetic gain of select seed to 20% by 2020.	5. Increase use of seed with genetic gain for pest resistance to 50% of select seed sown by 2035.
Programs	1. Conservation	2. Resilience	3. Tree Breeding 4. Operational Tree Improvement (OTIP)		
Plans	2015-2020 Conservation Strategy	Genecology 5- year plan including AMAT	1. Species Breeding Priority Ranking and Matrix 2. 5-year Breeding Plans by Species or Spp. groups 3. Species Plans – included in annual business plans (seed supply and demand; orchard production targets)		
Budget lines within Program (examples)	Conserv. Catalogue Ex situ collections Whitebark Pine Extension	Provenance trials by spp. (Coast/Interior) AMAT, CBST , CoAdapTree Ext. & Dec. Support	Progeny trials by spp. - Coast and Interior OTIP Projects – Coast and Interior Extension and Decision support		
Governance	Forest Genetics Council of BC (FGC)				
Technical Advisory Committees	Genetic Conservation (GCTAC)	Coastal and Interior TACs (CTAC & ITAC)			
Subcommittees		Species Committees – Coast and Interior OTIP Review Committee – Provincial			

Figure 1

FGC's New Governance and Business Planning Model

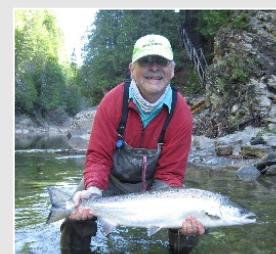
Heather Rooke

Heather worked for the Ministry of Forests for over 45 years. Heather started her career in providing "Excellence in Cone and Seed Services" at the Province's original seed centre in Duncan. She retired as the Manager, Tree Seed Centre, Surrey, in Jan 2018. Sadly, Heather passed away on Nov. 1, 2018. She was only 64 years old.



Jim Corrigan

Jim was the Ministry's Cone and Seed Orchard Pest Biologist from 2005 to April 2018 in Vernon. Jim provided advice and colourful reports to seed orchard managers to assist them with protecting their valuable trees and seed crops. He retired to his native New Brunswick and fishing. Sadly, Jim passed away on Jan 27, 2019.



In Memoriam

2.0 Budget and Expenditures

FGC's goals and objectives are supported by a variety of funding sources and agencies. The Ministry's Land Based Investment Strategy (LBIS) is one of the most important funding sources for forest genetics activities in BC. Over the past several years, the Ministry has allocated \$2.5 million annually in support of FGC programs. These funds are administered and allocated by the Ministry's Forest Improvement and Research Management Branch (FIRM) in consideration of FGC's advice and recommendations.

Table 1 summarizes FIRM's 2017/18 LBIS allocations and reported expenditures under FGC's streamlined model. The table also includes funding contributed by Select Seed Co. Ltd., which is owned by FGC.

Select Seed's funds were used to provide program management services to FGC and support the Ministry's tree breeding program. Select Seed generates revenue from selling seed produced in orchards operated under long-term contracts with five private partners located in the interior of BC.

Table 1

Summary of Land Based Investment Strategy and SelectSeed budgets and expenditures for the fiscal year ending March 31, 2018.

Program	Allocations (\$000)	Expenditures (\$000)
Genetic Conservation	\$ 164	\$ 164
Tree Breeding	\$ 1,341	\$ 1,341
Operational Tree Improvement Program (OTIP)	\$ 424	\$ 424
Resilience	\$ 571	\$ 571
Total LBIS	\$ 2,500	\$ 2,500
SelectSeed Co. Ltd. funding supporting FGC	\$ 251	\$ 240
TOTAL	\$ 2,751	\$ 2,740

Refer to FGC's annual business plans for further information and details of projects supported and funded through the Ministry's LBIS program.

The above table does not include other funds that support FGC's objectives and programs. This includes Ministry salaries, and operating and capital funding for its research stations, seed orchards and the Provincial Tree Seed Centre.

Forest companies, private seed orchards, Natural Resources Canada, Genome Canada, Genome BC, universities and other agencies also contribute directly and/or provide in-kind support to FGC's programs and activities. For example, forest companies assist with establishing and maintaining forest genetics field trials. Genomics research will also help inform tree breeding, selections and policy development.

3.0 Objectives and Performance Measures

The FGC strategic plan includes key five objectives and performance measures (PMs) for enhancing the value, resilience and conservation of BC's forests. Two enabling objectives support advancement of the former PMs.

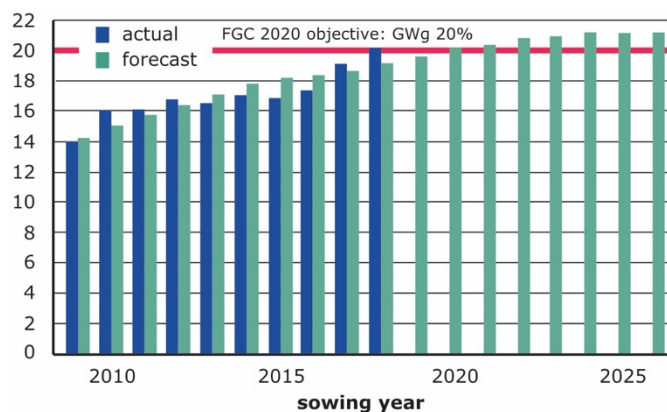
The first two PM's associated with select seed use have been tracked since 1999. Combined they contribute over 50% of the Ministry's 2017/18 performance measure for timber volume gains from silviculture investments¹.

3.1 Increase Genetic Gain for Growth

Performance Measure

Increase the average volume gain of select seed² used for Crown land reforestation to 20% by the year 2020.

Progress



The volume gain – or genetic worth for growth (GWg) – of a seedlot is the additional timber volume estimated to be available at harvest compared to using a wild stand seedlot. For example, a lodgepole pine seedlot with GWg 20 yields 20% more cubic meters of wood by age 60 compared to wild seed. Wood quality is also measured and is not compromised when selecting trees for growth.

This performance measure is derived from the weighted mean GWg of *all* Class A seed and cuttings sown in 2018 (including private lands). Superior provenance (B+) seed, all lodgepole pine with an assigned GWg of 3%, is not included. The weighted average GWg in 2018 was **20.1%**, which exceeds FGC's 2020 goal.

¹ See p. 11 Ministry Service Plan: www.bcbudget.gov.bc.ca/2017/sp/pdf/ministry/flnr.pdf

² Select seed consists of seed from orchards (Class A) and superior provenance natural stands (Class B+).

Figure 2
Actual and forecast annual average genetic worth for growth of seed orchard seed used in BC.



Rick Hansinger (L) and Mike Brown (R)

Inspecting PRT Growing Services & SelectSeed's Nelson Lodgepole Pine Seed Orchard, Armstrong.

Photo: Brian Barber

3.2 Increase Select Seed Use

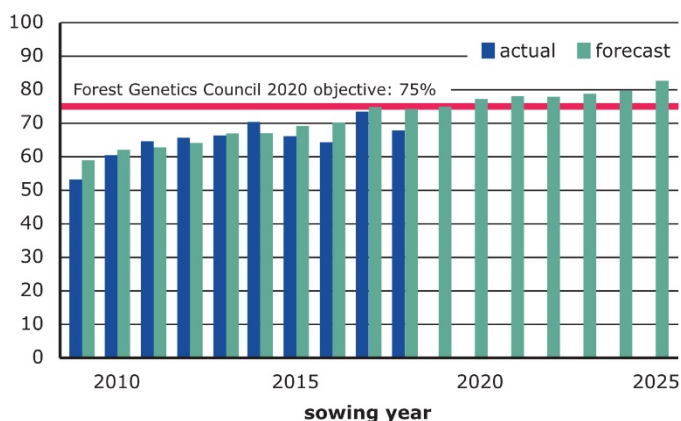
Performance Measure

Increase select seed use to 75% of the provincial total seed sown by 2020.

Progress

Figure 3

Actual and forecast select-seed use as a percentage of total provincial seed use, by year.

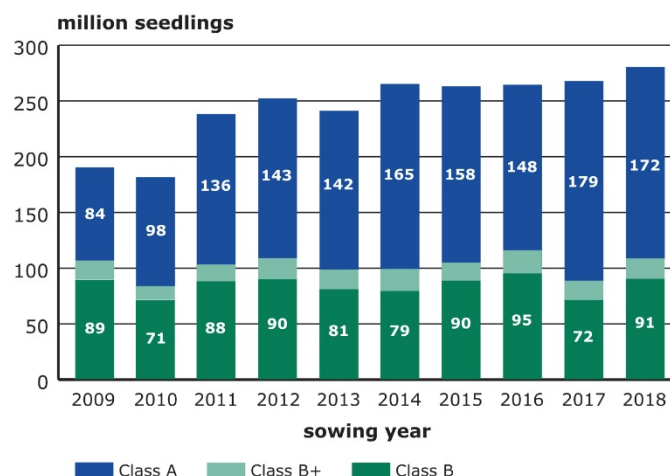


The total number of seedlings sown in 2018 was 280 million, including requests for private forest lands not entered into the Ministry's Seed Planning and Registry System (SPAR). Select seed use dropped from 73.1% of total use in 2017 to 67.7% in 2018 (see Figures 3 & 4). This drop was due to a higher number of seedling requests (compared to 268M in 2017) and a small orchard crop in 2017. Seedling demand is also expected to increase in 2018 in response to recent wildfires and other disturbances, and funding for new government programs.

FGC supported requests from the Vernon Seed Orchard Co. and the Ministry to develop new second-generation seed orchards in Quesnel and Prince George, respectively. FGC also encouraged SelectSeed Co. Ltd. to be involved in the new Pli orchards where it sees a viable opportunity. These decisions were made in consideration of the Interior TAC's recommended strategy for BC's northern Pli seed orchards, Chief Forester's Guiding Principles Respecting Seed Orchards, and to maintain a mix of public- and private-sector orchards and seed suppliers.

Figure 4

Provincial sowing of orchard (Class A), superior provenance, (Class B+) and wild-stand (Class B) seed.



The allocation of parent trees to establish the new Pli orchards will be based on recommendations from the Ministry's Pli tree breeder, who will also determine their climate-suitable deployment areas. In the interim, the existing Pli seed orchards, most of which are located in the Thompson-Okanagan region, and wild stands will continue to supply seed required for reforestation.

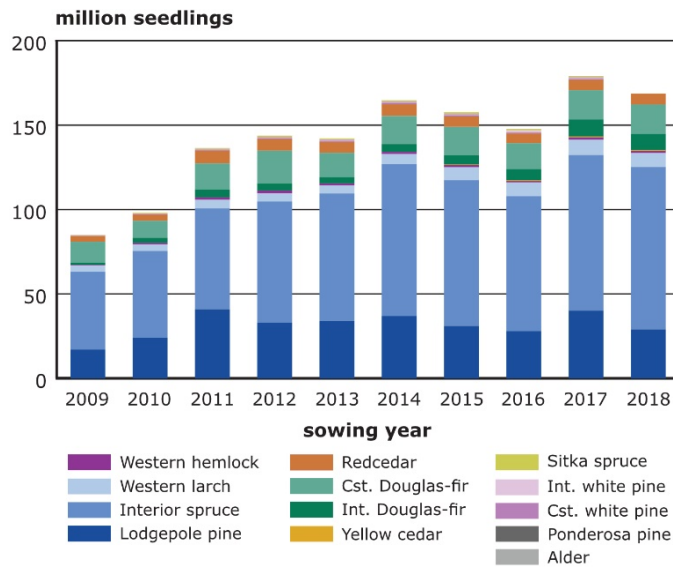


Figure 5

Provincial sowing of orchard seed (Class A) by species.

3.3 Increase Pest-Resistant Seed Use

Performance Measure

Increase the use of seed with a genetic gain for pest resistance to 50% of select seed sown by 2035.

Progress

Ministry geneticists, in collaboration with others, select and breed trees resistance (or tolerant) to native and introduced insects and diseases. Seedlots collected from these parents are registered with a genetic worth (GWr) that represents the percent of seedlings expected to survive an attack or infection.

This is the first year a genetic worth for resistance to terminal weevil has been assigned to interior spruce seedlots. Subsequently, this is also the first year that progress towards this performance measure is reported.



Spruce Weevil Trial

Jarrett Columbus applying terminal weevils to interior spruce seedlings to identify trees resistance to this prevalent forest pest.

Kalamalka Forestry Centre

Photo: Dr. Trevor Doerksen

Species	Resistance to	Seedlings (000s)
Lodgepole Pine	Gall rust	3,124.7
White pine	Blister rust	1,623.4
Sitka spruce	Terminal weevil	356.3
Interior spruce	Terminal weevil	35,244.1
Total		40,348.5
Percent of all Class A seed sown		24%

Table 2

Class A seedlings sown in 2018 with genetic resistance to insects and disease.

In Memoriam**Dr. Michael Carlson – Scientist, Leader and Volunteer**
September 6, 1944 - September 25, 2017

Dr. Michael Carlson was born in Los Angeles. At age 17, he enrolled in civil engineering at a California state college. In 1964, on a trip to Alaska with three friends he saw the Pacific Northwest's old-growth forests. This inspired him to transfer to forestry.

During the Vietnam war, Michael served as a Coast Guard Officer and Admiral's Aide. He subsequently pursued a Master's Degree in Forest Genetics at the University of Washington, and a Ph.D. in Genetics and Plant Breeding at the University of California, Davis.

In 1982, Michael joined the BC Forest Service as a scientist and tree breeder at the Kalamalka Research Station in Vernon. He led the Province's lodgepole pine breeding program for 25 years until his retirement in 2010 and served as FGC's Interior Technical Advisory Chair. Michael remained actively involved in the genetics program as a Scientist Emeritus until 2017.

Michael provided thousands of seedlings to enhance and restore riparian areas and forests in the Shuswap, North Okanagan and worldwide. When advocates sought to protect the Gellatly Nut Farm as a regional park, they turned to Dr. Carlson to help develop a long-term plant health and maintenance strategy.

Michael also served as Director of the Allan Brooks Nature Centre for +20 years and played a lead role in establishing its demonstration plantings, including the marine habitat pond. He was also an early supporter of Vernon's wastewater effluent system. Under his direction, poplar trees were planted on an effluent site, which generated revenue for the City in 2008.

Over the years, Michael mentored many students including High School Science Fair entrants and Ph.D. candidates. His former students valued his exceptional coaching skills and good instincts. He also lectured and supported teachers attending SFU's Summer Institutes in Environmental Education Field School. Another of Michael's rewarding adventures was volunteering with Doctors without Borders in Ecuador.

Michael received many awards for his outstanding contributions to Genetic Resource Management in British Columbia and his community leadership. These awards include: BC Forests Excellence Award; Regional District of North Okanagan Sustainability Award; Forest Genetics Council of BC's Achievement Award; and, The Queen's Diamond Jubilee Medal for Community Involvement.

Michael had great passion for the outdoors and developed a reputation as a fearless leader. He did not flinch when hanging out of helicopters to clip tree tops or guiding people of all ages and experience on kayaking on trips to Haida Gwaii, the Stikine River, Kitlope, Desolation Sound and numerous lakes and streams. He organized hiking trips to the Grand Canyon, and backcountry cross-country ski trips. He also contributed to the BC Big Tree Registry by finding and recording heritage trees. He ran marathons and lived life to the fullest.

Unfortunately, ALS robbed him of independence, physical freedom and subsequently his life at the age of 73.

Michael is survived by his daughters Kirsteen (Mark) and Gretchen, and grandchildren Anika and Kai, and his life partner, Marilyn Wells, and their Golden Retrievers.



Michael Carlson, PhD, RPF
photo: Jack Woods



John Murphy and Michael
Kalamalka Forestry Centre
Vernon, 1986
photo: Zbigniew Olak



Michael and Barry Jaquish.
Michael Carlson Demonstration
Garden dedication ceremony,
Kalamalka Forestry Centre
July 12, 2018.
photo: Greg O'Neill

3.4 Genetic Conservation

Performance Measure

Adequately conserve the genetic diversity of representative populations of all forest tree species native to BC by 2020, through a combination of *in situ*, *ex situ*, and *inter situ* conservation.

Progress

Conservation activities are guided by the Genetic Conservation TAC, its 2015-2020 strategic plan, and an *in situ* and *ex situ* conservation status catalogue for BC's 42 native tree species.

The conservation catalogue is maintained by the Centre for Forest Conservation Genetics located at the University of BC. The methods used to estimate each species conservation status by BEC zone continues to be refined.

Whitebark pine is the only tree species designated as a species at risk by the Federal government, which continued to vet its proposed recovery strategy for this species in 2017/18. Meanwhile, the Ministry and its partners continued to collect whitebark pine seed, establish field trials, and conduct inoculation and screening trials to identify blister-rust resistant parents.

Seed collections of bitter cherry, cascara, Pacific dogwood, Douglas maple and big leaf maple were also added to the Tree Seed Center's conservation bank.



Whitebark Pine Seedlings

Columns of blister-rust susceptible and tolerant whitebark pine families at the Kalamalka Research Station

Photo: Dr. Michael Murray

3.5 Resilience and Climate-based Seed Transfer

Performance Measure

By 2020, the selection and transfer of all tree seed used to reforest Crown land in BC will be guided by a climate-based seed transfer system that is regularly updated with new genecology and climate research information.

Progress

In September 2017, following extensive policy review and stakeholder consultations, the Provincial Chief Forester introduced an interim process for persons to voluntarily use new climate-based seed transfer (CBST) standards when planting seedlings in 2017 and submitting sowing requests for 2018.

Persons with reforestation obligations could apply for alternatives to the *Chief Foresters Standards for Seed Use* if they used the Ministry's new on-line CBST Seedlot Selection Tool to identify seedlots suitable for the biogeoclimatic ecological classification (BEC) variants of their planting sites.

Forty-two CBST alternatives for 5,130,000 seedlings were submitted and approved, which represents 2% of total seedlings requested for 2018 sowing.

An analysis of CBST impacts on seed use and inventories was also substantially completed, GIS maps were created, and modifications to the Ministry's information systems were made. CBST will be implemented through amendments to the *Chief Forester's Standards* in April 2018.



Margot Spence, RPF (R) explaining interim CBST policy near Fort St. John, Northern Silviculture Committee field tour, Sept. 2017

Photo: Brian Barber

FGC Fall Field Tour – Quesnel, October 2017

FGC holds an annual field tour in conjunction with its fall face-to-face meeting. Local practitioners are invited to participate to promote awareness of BC's forest genetics program, share information, and to learn of local operational issues.

This year's field tour took place near Quesnel on October 17, 2017. The field trip was hosted by staff of the Vernon Seed Orchard Company (VSOC), West Fraser Timber, and the Ministry of Forests.

The tour commenced at VSOC's Quesnel seed orchard. This site, established in 2011, contains three lodgepole pine seed orchards producing for the Prince George, Bulkely Valley and Central Plateau seed planning zones. Seed production is higher, and cones are larger at this site compared to orchards in Vernon that contain the same parents trees. The higher seed yields at VSOC Quesnel are largely attributed to its cooler-climate.

The tour continued North through TFL #5 formally held by Weldwood and now managed by West Fraser. Stops included:

- Micro-site planting trial which included a mix of lodgepole pine seedlings and spruce somatic seedlings.
- BC Timber Sales mixed species trial planted in 2013.
- Douglas-fir progeny test established in 1987.
- 60-year old Douglas-fir plantation, est. 1956 purportedly with seedlings grown from a coastal seed source.
- Commercial thinning operation in a 42-year-old stand.
- A plantation established 2007-09 on private land by an UK company to voluntarily offset its CO₂ emissions.

The tour was followed by a business meeting the next day at the Ministry's district office in Prince George.

Many thanks to the organizations and people who supported this special event.



Photos:

Top Right: Group picture behind a "migrated" western larch Class A seedling in its fall colours.

Middle Right: Dan Gaudet, VSOC, at VSOC's Quesnel Pli orchards.

Bottom Left: Barry Jaquish, RPF, describing spruce terminal weevil damage and genetic resistance.

Bottom Right: Jeff Mycock, RPF (left centre) discussing need for landscape level planning at a commercial thinning operation.

Photos: Brian Barber



3.6 Resources and Efficiency

Outcomes

Secure resources and coordinate stakeholder activities to efficiently meet Business Plan priorities.

Performance

This objective does not have a performance measure but serves to support the previous five objectives and their PMs, and annual business planning. Its outcome is realized by securing and allocating resources, supporting FGC's various subprograms, and coordinating stakeholder activities.

These tasks are conducted in accordance with FGC's governance model and annual business planning processes, Ministry procurement policies and procedures, and FGC's guiding principles that include collaboration, open communication, and the use of best science and business practices.

Activities

FGC met four times during the fiscal year, including three in-person meetings at Quesnel-Prince George (Oct. 2017 - see Feature Report), Richmond (Dec. 2017) and Victoria (Mar. 2018). Conference calls were held in June and Dec. 2016.

Council's discussions included the new streamlined governance and business planning model, development and implementation of CBST, development of new northern Pli seed orchards, and future seed needs in response to the recent wildfires, new government programs and timber supply declines.

FGC's technical advisory committees (TACs) also met to share information, review the status of projects, and develop priorities and budgets for the following fiscal year.

FGC also reviewed and approved Select Seed Co. Ltd.'s business plan and annual report; the latter at its Annual General Meeting held in June 2017.

FGC's meeting minutes are posted at: www.fgcouncil.bc.ca/membarea1506.html



OTIP Review Committee

L to R: Bevin Wigmore,
Tia Wagner, Rob Hunter,
Trevor Doerksen,
Darrell Wood, Mike Brown,
Gary Giampa,
Annette van Niejenhuis,
Krista Copeland.
February 2018, Vernon

Photo: Brian Barber



Select Seed Co. Ltd

Board of Directors tour
Kettle River Seed Orchards
Sept. 2017

L to R: Henry Benskin, RPF (Ret),
Kerry McGourlick, RPF, Reid Carter, RPF,
Jim Burbee, RPF, Glen Dunsworth (President)
and Brian Barber, RPF (CEO)

Photo: Brian Barber

3.7 Monitor and Report

Performance Measures

Annually produce a business plan, annual report and project report.

Progress

FGC's annual report for 2016/17 was also published in a format similar to this year's report and included progress towards FGC's 2015-20 strategic goals and performance measures for value, resilience and conservation.

A 2017/18 Business Plan was also printed. It included a comprehensive set of species plans that include information about breeding activities and seed orchards for each seed planning unit (SPU), including orchard status, genetic gain, and seed production history and forecasts. The plans also include historical SPU seedling needs, sowing factors, and seed inventories as of August 2017.

No annual project report was produced (last published in 2014), but project updates were provided at the TAC's annual meetings; the Interior and Coastal TAC annual extension meetings in Vernon and Cowichan Lake, respectively; and, at provincial silviculture committee workshops and field trips.

The FGC Program Manager and several others from BC also made presentations at the joint Western Forest Genetics and Canadian Forest Genetics Associations meeting held in Edmonton in June 2017.

FGC, in collaboration with the Ministry's CBST Project Team, also set up information booths at the Association of BC Forest Professionals (ABCFP) AGM and Conference held in Victoria, and the Northern Silviculture Committee's winter workshop held in Prince George, both in February 2018.

FGC business plans, reports, species plans and other documents can be found on FGC's website at: www.fgcouncil.bc.ca



Genome BC MLA Event

Brian Barber and the Hon. Doug Donaldson, Minister of Forests, Lands, Natural Resource Operations and Rural Development, at Genome BC's MLA event. October 2017, Victoria

Photo: Brian Barber



ABCFP Conference 2018

L to R: Brian Barber, Margot Spence, Leslie McAuley. February 2018, Victoria

Photo: Brian Barber

Recognition



Raoul Wiart, RPF

Raoul served on FGC from 2011 to Sept 2017 as Canadian Forest Service's representative. He retired from Canadian Wood Fibre Centre as Director, Research Integration. He was acknowledged for his passionate support of his staff and their work. Happy travels Raoul.



Jack Woods, RPF

Jack retired from the role of FGC Program Manager, and CEO, SelectSeed the previous year. In March 2018, Jack was presented with FGC Achievement Award by Diane Nicholls, RPF, Chief Forester for his outstanding contributions. A tree was also planted in Jack's honour at the Cowichan Lake Research Station.

4.0 Seed Orchards and Crops

In 2017, there were 96 seed orchards in BC managed by the Ministry and private companies, including SelectSeed which is wholly owned by the FGC. These orchards, which contain over 117,000 parent trees, produce seed for the major commercial tree species and most areas in the province (see FGC Species Plans).

Seed production varies from year-to-year in response to changing climatic and biological conditions (see Figure 6). The 2017 orchard seed crop was very “light”. Several species produced little to no crop. Only 210 kg of seed, equivalent to 21.4 million seedlings, was collected (see Table 3); approx. 10% of the 2016 crop.

Although Pli orchards contributed the majority of the 2017 seed crop, many Pli orchards produce less than originally forecast and well below current demand. New Pli orchards established in cooler climates are needed, like VSOC Quesnel.

Species	Species Code	Seed produced (kg)	Seedling equivalents (million)
Western redcedar	Cw	14.2	1.4
Red Alder	Dr	1.2	0.1
Coastal Douglas-fir	Fdc	0.1	0.0
Interior Douglas-fir	Fdi	9.6	1.0
Western hemlock	Hw	9.2	0.9
Western larch	Lw	0.0	0.0
Lodgepole pine	Pli	116.9	11.9
White pine	Pw	0.0	0.0
Ponderosa pine	Py	0.0	0.0
Sitka spruce	Ss	8.8	0.9
Interior spruce	Sx	50.9	5.2
Total		210.8	21.4

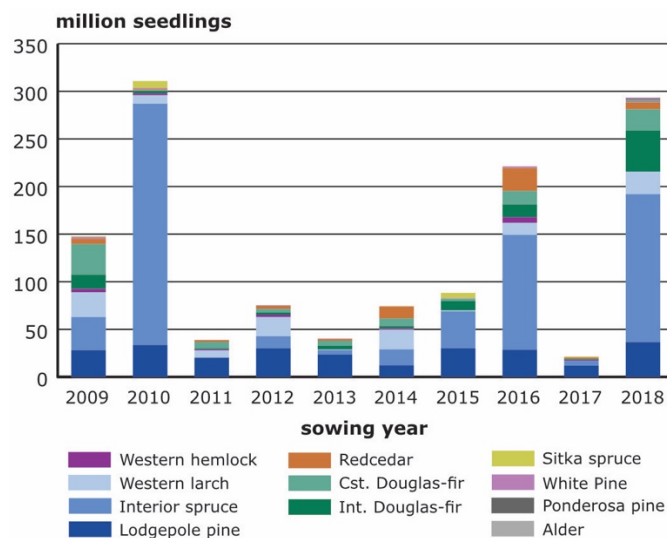


Figure 6
Orchard seed production
by species and year
2007-2016.

