Forest Genetics Council of BC
Business Plan 2006 – 2007

Compiled and edited by

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FGC Program Manager

Message from the FGC Co-Chairs

We are pleased to present the 2006/07 Business Plan of the Forest Genetics Council of BC. This is the sixth annual Business Plan, and it represents a substantial co-operative effort by many people in government, industry, and universities throughout BC.

The Business Plan sets out a balanced set of activities, including gene conservation, tree breeding, seed production, technical support, and extension. It also details activities for Forest Investment Account (FIA) Tree Improvement Program spending. These funds leverage other investments by industry, government and universities, and are critical for facilitating integrated planning and other key activities.

This fiscal year presents a number of new challenges and opportunities. The Future Forest Ecosystems Initiative of the provincial Chief Forester has started a process of re-evaluating forest management activities to increase the resilience of forests to perturbations such as climate change and pests. The deployment of genotypes to facilitate species or genotype migration is an important component of this initiative. Contributions from Council and its associated committees will be an important component of the initiative, and will be a significant activity during the coming year. New directions from FFEI are also likely to result in a changing strategic focus for the Council; a challenge that will face us in the coming period.

Mountain pine beetle (MPB) losses continue to mount, and are reflected in much higher planting and seed use in some seed planning units. This increased seed demand is placing pressure on industry and provincial forestry staff to obtain sufficient seed; particularly for lodgepole pine. We are challenged to provide as much seed as possible from provincial pine orchards, and to provide information on superior provenances suitable for seed collection. Projects are underway on these fronts.

Provincial seed orchard production continues to increase, however planting also increased to over 275 million last year, due primarily to MPB. This is placing even more demand on seed orchard, and the production of lodgepole pine seed continues to be the largest challenge facing Council with respect to seed use and gain objectives. Council support for cone induction pest management research will assist in this area, and maturing pine orchards are expected to continue to produce more seed.

As we move forward to another year of work and planning, we would like to thank all those on Council and affiliated committees for their co-operation and hard work over the last year. It is only through cooperation and good strategic focus that gene resource management activities will meet the dynamic challenges of dynamic forest management.

John Elmslie, RPF
FGC Co-chair
Winton Global Ltd.

Dr. Dale Draper
FGC Co-chair
Ministry of Forests and Range

Budgets list allocations of funds provided by the Forest Investment Account

Budgets in this Business Plan were approved
by the Forest Genetics Council of BC on
March 8, 2006

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1.0 Introduction

This section overviews the relationship between the multi-stakeholder Forest Genetics Council and its co-operators in the planning and implementation of forest gene resource management activities in British Columbia, and for the management and allocation of funds under the Forest Investment Account (FIA).

1.1 Forest Genetics Council of BC

The FGC is a multi-stakeholder group representing the forest industry, Ministry of Forests and Range and Range (MOFR), and universities. Council's mandate is to lead a provincial forest gene resource management (GRM) program that encompasses the conservation, controlled use, and enhancement of the genetic resources of forest tree species, and to advise the Chief Forester on forest gene resource management policies.

The FGC provides a forum for stakeholder representatives to set goals and objectives and to oversee the development and delivery of a Business Plan to fulfill these goals. Council's goal and objectives, as stated in the FGC Strategic Plan for the period 2004 to 2008, are:

To lead the cooperative management of tree gene resources in British Columbia consistent with scientific and conservation principles, by:

1. Increasing the average volume gain of select seed[1] used for Crown land reforestation to 20% by the year 2020.
2. Increasing select seed use to 75% of the provincial total sown by 2013.
3. Supporting gene conservation research and the cataloguing of indigenous-tree genetic resources.
4. Coordinating stakeholder activities and securing resources to meet Business Plan priorities.
5. Monitoring progress in gene resource management activities.

The FGC Business Plan defines the annual set of activities and associated budgets to achieve these objectives.

1.2 A Co-operative Effort

Forest gene resource management is a co-operative effort. The MOFR leads tree breeding activities, while private industry and the MOFR manage seed orchards for the operational production of reforestation materials. Universities, MOFR Research Branch, and the Canadian Forest Service undertake research supporting gene resource management, while private industry focuses on applied research related to operational production.

[1] "Select" describes seed and vegetative material having a level of genetic gain (GW > 0). All seed and vegetative lots derived from orchards and production facilities (genetic Class A) and superior provenances (genetic Class B+) are considered to be select.

1.3 Forest Investment Account Tree Improvement Program

Beginning in fiscal year 2003/04 the provincial government introduced the Forest Investment Account (FIA) as a mechanism for promoting sustainable forest management in British Columbia. FIA is founded on a Vote of the Legislature and includes three major objectives:

- Support sustainable forest management practices;
- Improve the public forest asset base;
- Promote greater returns from the utilization of public timber.

FIA is delivered through seven programs; including the FIA Tree Improvement Program.

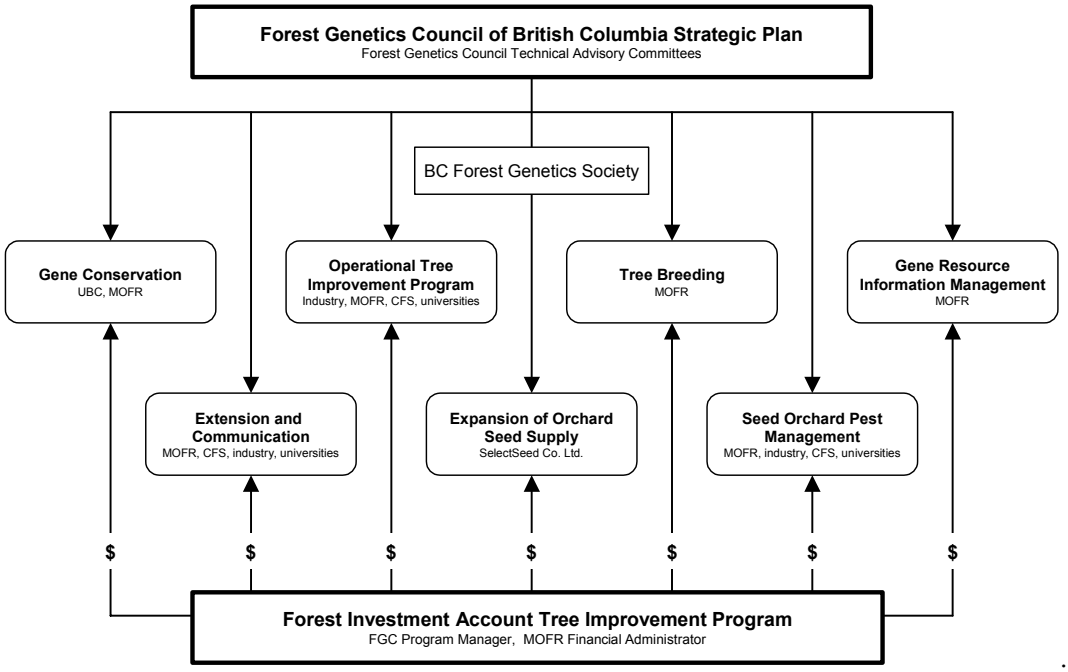
FIA investments are guided by the Forest Investment Council, and administered by the Ministry of Forests and Range (MOF). The MOFR has decision-making authority with respect to FIA expenditures, and with assistance from other provincial government ministries, establishes objectives and delivery standards.

FIA Tree Improvement Program investments are made under the provincial Tree Improvement Program. The Forest Genetics Council has responsibility for setting priorities and developing an annual business plan to meet provincial objectives. The MOFR administers funding through the subprogram areas identified in the FGC Strategic and Business Plans (Figure 1).

Business planning is carried out through the existing FGC-led process, with Technical Advisory Committees (TACs) undertaking specific planning activities, developing budgets, and making operational recommendations (Figure 2). FGC reviews and makes final recommendations for subprogram budgets and activities, and ensures the overall program meets FIA objectives and budgetary limits. The program is managed and coordinated by the FGC Program Manager on behalf of the FGC, and by the Tree Improvement Program Administrator on behalf of the Ministry of Forests and Range .

In addition to FIA investments in gene resource management, MOFR and private companies also fund activities under Council's Business Plan. The species plans found in Appendix 4 outline general strategy, predict seed orchard seed production and gain, and summarize conservation status.

Figure 1 Relationship between the FGC Strategic Plan, Forest Investment Account TIP, and participants in the TIP subprograms.



2.0 Process for Business Plan Development

2.1 The Role of Council and its TACs

FGC members, representing the Ministry of Forests and Range (MOF), forest companies, universities, and the Canadian Forest Service provide strategic direction to the provincial forest gene resource management program. FGC Technical Advisory Committees (TACs) provide technical and policy information to Council and contribute to the development of FGC plans and associated budgets. The FGC Business Plan consolidates the subprogram plans and budgets into a comprehensive package that addresses Council's objectives and maximizes the economic benefits from tree improvement.

Council's six TACs lay the groundwork for the FGC Business Plan:

- The Gene Conservation TAC (GCTAC) advises Council on issues related to gene conservation and genetic diversity, and identifies required activities and budgets under the Gene Conservation Subprogram.
- The Coastal and Interior TACs, through their Species Committees, prepare Species Plans (Appendix 4) that outline strategy and activities for the Tree Breeding, Operational Tree Improvement Program (OTIP), and the Expansion of Orchard Seed Supply (SelectSeed Company Ltd.) subprograms.
- The Extension TAC (ETAC) is responsible for developing a strategy and annual activity plans for the Extension and Communication Subprogram.
- The Gene Resources Information Management Steering Committee oversees the development of activities and budgets for the Gene Resource Information Management Subprogram.
- The Seed Orchard Pest Management TAC identifies information and research needs, and guides both research and extension activities needed to develop control strategies for seed orchard insect and disease pests.

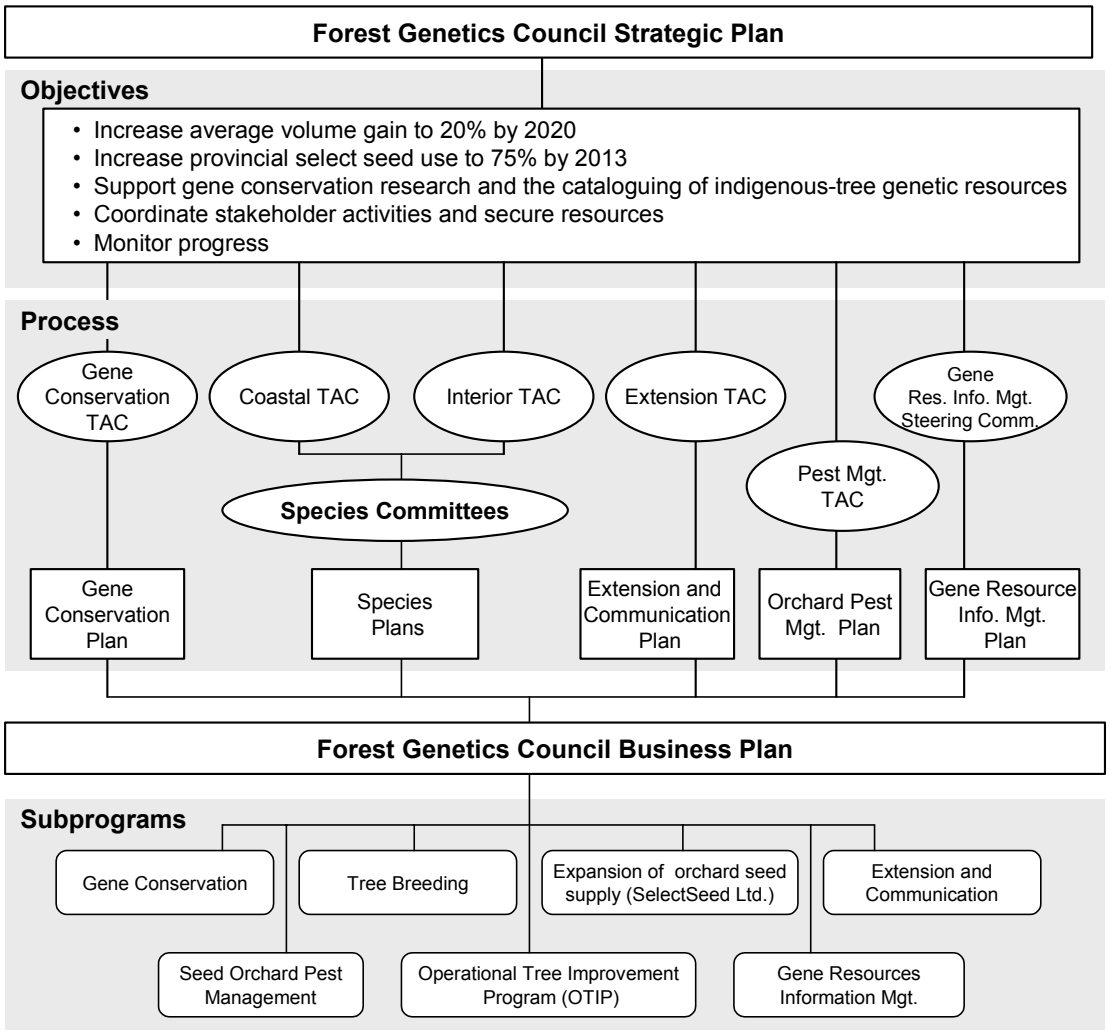
In addition to the six advisory committees, Council establishes other committees as needed. Starting in April, 2006, incremental FIA fnds, directed at programs to mitigate losses associated with the mountain pine beetle infestation, have resulted in an expected 3-year expansion of the FGC-led program. To meet planning needs for some of the incremental projects, Council established two new steering committees to advise on cone induction research (University of Victoria), and applied forest genetics and biotechnology research (University of BC). Both projects are supported through FGC-directed funds.

Program financial administration and support is led by the MOFR Tree Improvement Branch. Program management, including business plan and annual compilation, is led by SelectSeed Company Ltd. (SelectSeed) on behalf of Council.

Council reviews all strategies, plans, or recommendations from the TACs and from SelectSeed for approval (or revision) before incorporating them into the FGC Business Plan. Figure 2 illustrates this hierarchical structure and the link between FGC objectives, planning processes, and the seven subprograms through which it is implemented.

The process by which the Council Subcommittees or other agencies define activities and budgets for each subprogram is discussed in Section 3. Since it is often difficult to accurately predict project spending, subprogram leaders are authorized to reallocate funds within their subprograms as necessary throughout the fiscal year, subject to limits and review processes.

Figure 2 The link between FGC objectives, planning processes, and the subprograms of the FGC Business Plan



3.0 Subprogram Planning and Management

3.1 Gene Conservation Subprogram

Gene conservation activities monitor and catalogue indigenous tree gene resources, research conservation methods and needs, and provide guidance on to policy development.

3.1.1 Planning

Gene conservation activities are developed through the FGC Gene Conservation TAC (GCTAC), with programs and spending approved by the FGC.

Subprogram delivery is through the Centre for Forest Gene Conservation at the University of BC (UBC) in the Faculty of Forestry, with the GCTAC setting broad objectives. The Centre provides expertise, research, and strategic planning related to gene conservation, and evaluates levels of protection of genetic diversity.

3.1.2 Management

The Centre receives funding through a Transfer Agreement with the Ministry of Forests and Range Tree Improvement Branch under the FIA Tree Improvement Program. In addition, the Centre collaborates with other groups and agencies, and seeks funding from other sources as opportunities arise. Significant adjustments in technical objectives or budgets must be approved by the GCTAC.

3.1.3 Activities and Budget

The Centre for Forest Gene Conservation will help identify specific *in situ* and *ex situ* conservation needs and strategies to address these needs, and will assist with forest certification and climate change issues as they relate to gene conservation and management. It will also allow the leveraging of funds with other national and international agencies.

In the 2006/07 fiscal year, the Centre will receive $220,000 for continuing with the cataloguing of tree gene resources, investigating the genetic structure of minor- and non-commercial tree species, modeling climate change impacts on species ranges, development of a theoretical conservation framework, and other conservation projects. Table 1 contains a Centre budget for 2006/07 FIA-funded activities. In-kind contributions from UBC will include staff time, lab and office space, computing facilities and IT support. Industry and MOFR contributions will include staff time and logistical support for specific projects. Other funding is leveraged through an NSERC Strategic / BIOCAP Canada grant.

An incremental project, funded through the FGC-directed incremental FIA funds directed at mountain pine beetle (MPB) management and mitigation, will use growth chambers to estimate the general seedling response to temperature. Orchard and wild seed from different seed zones for two conifer species will be used. The objectives of this project are to determine the relative role of temperature means versus temperature extremes in determining growth-response curves, and to evaluate the impact of mild to moderate drought stress on temperature response curves.

Table 1 **Centre for Forest Gene Conservation budgets for 2006/07, by project. Budgets include only activities funded by the Forest Investment Account.**

Project	Budget ($)	Products
Cataloguing and documenting in situ protection	32,000	Final report on conservation status; 1 paper on in-situ conservation and climate change
Theoretical framework document(s)	3,000	Theoretical framework (report part of conservation status report)
Markers / theory for diversity measures	9,000	1 final report
Whitebark pine diversity and conservation	1,000	Completion of three scientific papers and recommendations for conservation
Genetic structure of minor species	42,300	1 progress report on Pacific dogwood 1 progress report on Garry oak
Climate change and gene conservation	35,000	1 progress reports; 1 final report
Other expenses		
Research associate	71,390	
Extension	6,839	100 clients serves / 1 website maintained
CFGC Expenses (office, lab, computer)	9,000	
Subtotal	**209,529**	
Incremental FIA Project *		
Seedlot response to climate variables	47,500	1 progress report
5% UBC overhead	12,971	
Total approved budget	**270,000**	

* Total incremental funding amount $50,000, including UBC overhead.

3.2 Tree Breeding Subprogram

The Tree Breeding Subprogram focuses on the continued development of improved of seed and vegetative materials for reforestation. Tree breeding activities include selecting parents in wild stands, propagation, testing offspring, mating, establishing/maintaining/measuring trials, and technical support. Selections from wild populations are largely complete, as all breeding programs are in advanced generation breeding and testingt. The Subprogram also includes genecology trials and research to support the information needs of seed planning unit[2] (SPU) programs as described in Species Plans. Tree breeding and genecology work is led by the MOFR Research Branch.

3.2.1 Planning

FGC Interior and Coastal TACs and their associated Species Committees assisted with planning and strategy development for the Tree Breeding Subprogram. Through the development of species plans (Appendix 4), Committees estimated seed demand, orchard seed production, and program needs for each SPU. Breeding, genecology, and genetics research strategies developed by MOFR tree breeders were reviewed, and direction was given to ensure close alignment with FGC strategic objectives and with ongoing operational needs and programs. Species Committees also review proposed budgets and progress reports for each SPU.

The budget for the Tree Breeding Subprogram was developed for individual SPU by Species Committees in the fall of 2005. It was then adjusted by the Manager, Forest Genetics, MOFR

[2] Seed planning units—groupings by species, seed zone, and elevation band—form the basis for tree breeding and seed production planning.

Research Branch to find efficiencies and to meet the total expected Subprogram budget allocation, with input from MOFR tree breeders, the FGC Program Manager, and the MOFR Tree Improvement Branch Director. Final programs and budgets were reviewed and approved by the FGC on March 8, 2005.

3.2.2 Management

The MOFR manages Tree Breeding Subprogram activities, and reports to the FGC. The Manager of Forest Genetics, MOFR Research Branch, has authority for project re-allocations in support of FGC objectives. Substantial re-allocations between seed planning units or from breeding activities to technical support activities require the approval of the Director, Tree Improvement Branch and the FGC Program Manager.

3.2.3 Activities and Budget

The 2006/07 budget for the Tree Breeding Subprogram is approved at $2.548 million, including $2.1 million from the ongoing FIA allocation, and $448, 000 from the incremental FIA budget. The incremental funding supports maintenance and measurements on long-term progeny and provenance trials in the interior. Additional information generated will aid with programs associated with MPB mitigation. Table 2 contains approved budgets and key performance indicators (KPI) for breeding activities by SPU. Approximately of $1,100,000 of the total budget will cover MOFR Research Branch salary costs, and $30,000 will be risk-managed.

As in previous years, about 70% the effort and funding will go towards the establishment, maintenance, and measurement of progeny tests. This work will include, for example, the 10-year measurement of coastal Douglas-fir realized-gain trials, measurement and maintenance of 8 redcedar progeny tests, wood density mapping in lodgepole pine provenance trials, and the measurement/maintenance of progeny and provenance trials across all seed planning units in support of seed orchards, seed transfer policy development, and climate-change research.

3.3 Operational Tree Improvement Program (OTIP)

The OTIP supports FGC objectives to increase the quality and quantity of select seed produced from existing private and MOFR seed orchards. It also provides technical support for orchard production and management.

3.3.1 Planning

OTIP investment is based on input from species plans developed by species committees reporting to the Interior and Coastal TACs. Species plans outline seed and cutting production strategies within each SPU. Based on these strategies, and on priority lists approved by the TACs, a formal call for proposals is issued.

FGC committees review and rank all proposals against FGC objectives and SPU priorities, based on technical merit, impact, value, and cost. OTIP projects are selected to increase the genetic gain in seed made available for reforestation and to increase the quantity of seed produced from existing orchards. They support FGC short-term objectives for gains in the growth rate, pest resistance, and wood quality of reforestation materials. They also support FGC long-term objectives through the replacement of trees in existing seed orchards with trees of higher genetic value. The total budget allocation for OTIP is recommended by the FGC to FIA administrators in the Ministry of Forests and Range .

3.3.2 Management

The MOFR Tree Improvement Branch administers the OTIP in accordance with recommendations from the FGC. Requests for re-allocations or for new funding are handled by the MOFR Tree Improvement Financial Administrator in consultation with the appropriate TAC and the FGC Program Manager. All projects report on key performance indicators to enable tracking of planned activities.

3.3.3 Activities and Budget

The 2006/07 OTIP budget is $686,000, with a further $31,100 in approved projects to be funded through risk management (expected project under-spending during the year). In addition, a further $123,000 is approved from the incremental FIA appropriation. This latter money will be directed at activities associated with interior seed planning units and MPB mitigation. Table 3 contains approved OTIP budgets and KPI for all seed planning units.

Table 2 2006/07 budgets ($ x 1000) and KPI by SPU for tree breeding and associated technical support activities.
See Species Plans (Appendix 4) for more detail. Category numbers relate to Work Breakdown Structure (Figure 5).

						220 Selection and Breeding						*230 Progeny testing*												*240 Technical Support*								*250 Provenance testing*										
				211		221		222		223		231		232		233		234		235		236		240-1		240-2		240-3		240-4		252		253		254		255		256		
Seed Planning Unit				# fam. select.		# fam. establ. in breeding arboreta		# fam. maint. in breeding arboreta		# of crosses made		# of test sites designed / sown		# of progeny tests establ./prep		# of progeny tests maintained		# of progeny tests measured		# tests assessed for wood / pests		# of test sites analyzed		Projects								# of prov. tests establ. / prep.		# of prov. tests maintained		# prov. tests measured		# tests assessed for wood / pests		# of test sites analyzed		Total
#	Spp.	SPZ	Elev (m)	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	$,000
1	Fdc	M	1-700	50	5					100	5			6	60	12	25					6	3	5	20	1	5	4	10											133
2	Cw	M	1-600	100	0	100	5	1,200	3	150	20	6	20			18	35	8	42	2	18	8	5			4	10							6	10	6	10			178
3	Hw	M-S	1-600	0	0	60	2	220	2	120	10					17	25	7	35	1	7	4	1	1	1	3	15	1	1					14	7	3	1			107
4	Sx	NE	1000-1500																																					-
5	Sx	NE	1500-1900																																					-
6	Ss	M	1-500	30						30	5	3	12	2	15	12	51	3	35	1	10			1	7															135
7	Pli	NE	700-1400	50	5											3	6			40	16					8	16													43
8	Pw	M/SM	1-1400	30			14	20	12	30	10			3	24	9	10	3	10					1	15															95
9	Ba	M	1-1000																													2	8	8	12	8	14			34
10	Pli	TO	700-1400	50	5											3	6																							11
11	Yc	M	1-1100	40	0	160	5	500	3	100	10	6	18			9	12		0			3	2	6	8	6	10	6	6					5	10	5	10			94
12	Pli	PG	700-1200							12	5					4	12	2	6	1	20																			43
13	Lw	NE	700-1200					2,000	17	100	2													3	15															34
14	Sx	PG	600-1200											4	25	2	14							4	25	4	20	2	5					15	45					134
15	Pw	KQ	500-1400	50	3	100	6																			2	4													13
16	Pli	TO	1400-1600																																					-
17	Pli	BV	700-1200													4	12																							12
18	Pli	CP*	700-1100	40	20									3	30			2	6																					56
19	Fdc	SM	200-1000	20	5											3	10																							15
20	Pli	NE	1400-2000																																					-
21	Fdi	NE	400-1000							100	2					4	20	2	14			2	0	1	6									3	6	3	9			57
22	Fdi	NE	1000-1600							100	2																													2
23	Sx/Ss	SM/NST	1-800																																					-
24	Hw	M	600-1100																																					-
25	Sx	EK	750-1700													2	20	2	8																					28
26	Pli	PG	1200-2000																																					-
27	Cwr	SM	200-1000													3	9	3	6																					15
28	Sx	TO	1300-1900																																					-
29	Pli	EK	1500-2000																																					-
30	Sx	TO	700-1300																																					-
31	Fdc	M	700-1200													2	8	2	8																					16
32	Pli	EK	800-1500																																					-
33	Cwr	SM	600-1500													3	7	3	6																					13
34	Lw	EK	800-1500							100	2													4	14															16
35	Sx	BV	500-1200													3	6																							6
36	Bg	M	1-700																															8	2					2
37	Fdi	QL	700-1200																																					-
38	Hw	M-N	1-600																															0	0					-
39	Fdi	EK	700-1400																																					-
40	Sx	PR	650-1200					5,000	22							4	12																							34
41	Fdi	PG	700-1000			0	1																																	1
42	Sx	PG	1200-1550																																					-
43	Fdi	CT	600-1200																																					-
44	Sx	NE	1-1000																																					-
45	Pli	BB/CHL	all																																					-
46	Bl	all int.	all																													6	18	4	8					26
47	Bn	M	all																																					-
48	At/Ep/Ct	interior	all																																					-
49	Dr/Ct/Mb	Coast	all	100	3	100	4	100	3			4	12																			4	87	2	10	2	6			125
50	Lw	NE	1200-1800																																					
																																					Salaries			1,100
																																					Risk managed			30
				560	46	520	37	9,040	62	942	73	19	62	18	154	117	300	37	176	45	71	23	11	26	111	28	80	13	22	0	0	12	113	65	110	27	50	0	0	0	0	**2,548**

Table 3 2006/07 budgets and KPI by seed planning unit for Operational Tree Improvement Program (OTIP) projects. Budgets and KPI include projects from and incremental call. Category numbers relate to Work Breakdown Structure (Figure 5). See species plans (Appendix 4) for more detail.

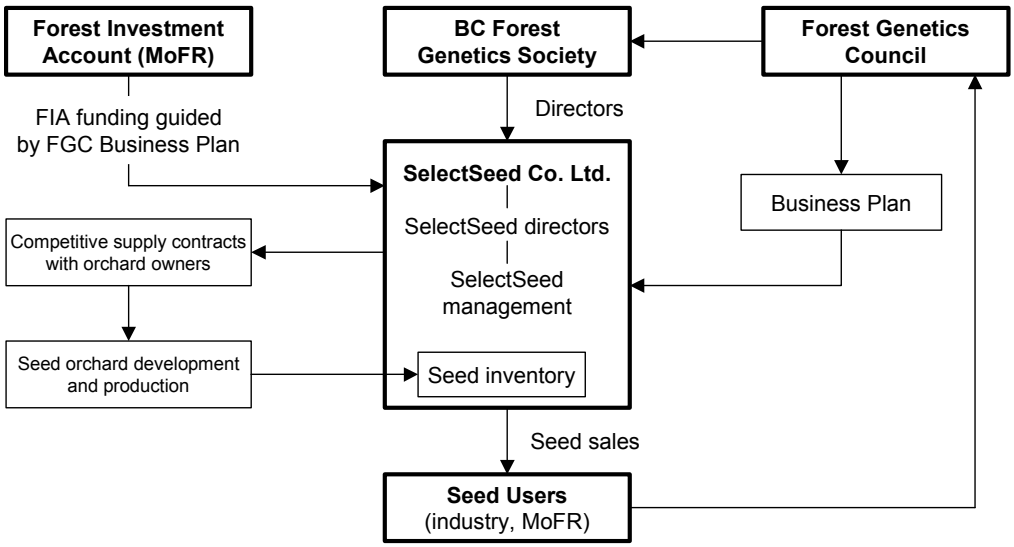
Seed Planning Unit				*320 Quality / Quantity Boosts*												*330 Cuttings*		*340 Pest Management*						*350 Tech Sup.*		Total $ x 1000
				321 # ramets grafted		322 # ramets in holding		323 # ramets replaced in orchards		324 # ramets rogued in orchards		325 # ramets treated with SMP or CP		326 # ramets induced for cone production		327 # ramets managed in orchards		331 # donor plants for cutting prod.		341 # ramets treated for insects		342 # ramets treated for disease		343 # ramets monitored for pests		# of projects		
#	Spp	SPZ	Elev (m)	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	$
1	Fdc	M	< 700	1000	1.1	1314	1.1	1557	7.8			2134	18.5	1250	2.8	6466	17.4			3808	7.9					4	50.7	107.4
2	Cw	M	< 600	20	.2	4840	6.1			500	.5	1460	13.5	612	2.6	1516	3.7			1439	2.0					2	18.1	46.7
3	Hw	M	< 600									940	5.2			1362	4.3			755	.5					1	4.1	14.0
4	Sx	NE	1000-1500	190	2.4	313	1.4	295	4	993	5	510	1.3			250	.7			1878	5.2	1878	.7	1878	1.1	3	46.9	68.6
5	Sx	NE	>1500	240	2.5	424	2.3	311	4	729	4.7	464	1.2			249	.4			1835	5	1835	.7	1835	1.1			21.8
6	Ss	M	< 750	6	.1	74	.1	6	.1	0	0	350	5.2			514	2.2			594	1.2							8.8
7	Pli	NE	< 1400	100	.7	100	.2	2100	14.5	70	1.1	7050	12.4			5399	9.3			3840	6.5	2850	1.7	3840	2	7	74.3	122.6
8	Pw	M/SM	< 1000									650	3.8			350	.3			650	3.0							7.1
9	Ba	M	< 1000																									0.0
10	Pli	TO	< 1400	208	1.4	185	.3	193	.5	56	1.6	5069	8.6			2183	2.4			6213	6.0	2183	2.6	6213	2.9			26.3
11	Yc	M	<1200													14755	4.2	7056	11.9	9511	1					4	34.5	51.5
12	Pli	PG	<1200									505	7.3	30	.5	9440	4.6			7290	5.7	1440	.2	7290	3.1	2	11.1	32.4
13	Lw	NE	< 1300	367	3	90	.6	79	1.1	25	.3	1190	1.8			396	.6			1190	5.2	1583	.5	1691	4.6			17.8
14	Sx	PG	< 1200	2500	21.5											2500	2.1			8000	4.2			8000	2.5	2	21.9	52.3
15	Pw	KQ	<1400	72	1	224	1.4	19	.3			2680	8.3			555	1			2815	21.9	2221	.7	2241	1.7			36.1
16	Pli	TO	> 1400									1628	10.7	600	1.3	2208	10.3			628	2.5	628	1.7	628	.9	1	13.2	40.8
17	Pli	BV	<1200							173	2.8	761	4.6	530	4.1	2033	5.3			9181	10.9	3331	.7	16881	7.8	1	5.9	42.2
18	Pli	CP	<900 *									454	3.2			1039	1.8			5300	4.7	1000	.2	5300	2.6	1	6.7	19.2
19	Fdc	SM	200-1000													1000	4.0											4.0
20	Pli	NE	> 1400																									0.0
21	Fdi	NE	< 1000									2114	3.3	600	2.0					2114	2.9			2114	1.0			9.1
22	Fdi	NE	> 1000	25	.9	4	.03	21	.3			923	2.5	308	1.2	381	.6			1525	4.9	1525	.5	1525	.9	1	3.4	15.2
23	Sx/Ss	SM/NST	all																									0.0
24	Hw	M	> 600	100	.8	266	.3	70	.4			323	.9			323	1.6			840	.9							4.9
25	Sx	EK	< 1700																	1151	5.6							5.6
26	Pli	PG	> 1200																									0.0
27	Cw	SM	200-1000																									0.0
28	Sx	TO	1300-1850							83	.4	370	1.2			1038	.7			1038	3.5	1038	.2	1038	1.1			7.1
29	Pli	EK	> 1500																									0.0
30	Sx	TO	< 1300																									0.0
31	Fdc	M	> 700											180	1.9													1.9
32	Pli	EK	< 1500	302	2.3	240	1.3	103	1.5			300	1.4			388	.6			1551	2.4	1551	.5	1551	.9			10.8
33	Cw	M	> 600	0	0	0	0	0	0																			0.0
34	Lw	EK	800-1500	179	1.7	55	.3	36	.5	40	.6									716	3.5							6.6
35	Sx	BV	< 1200	205	2.1	490	1.8	622	7.7	430	1.4	498	1.5			168	.3			2802	4.3	2802	.6	2802	.9			20.6
36	Bg	M	< 700																									0.0
37	Fdi	QL	< 1200									300	2.4	180	.6					351	2.1			351	1.0			6.0
39	Fdi	EK	all																									0.0
40	Sx	PR	650-1200					48	.6			2715	1.1			178	.3			2941	.8	2715	1.0	10	.3			4.2
41	Fdi	PG	< 1000									300	4.3	150	.6					540	2.4			540	1.0			8.3
42	Sx	PG	> 1200							630	.8									1363	1.2	347	.3	1363	1.5			3.8
43	Fdi	CT	600-1200									600	4.7	450	1.5	900	2.8			1050	4.3							13.4
44	Sx	NE	1-1000																									0.0
45	Pli	BB/CHL	all																									0.0
46	Bl	all int.	all																									0.0
47	Bn	M	all																									0.0
48	At/Ep/Ct	interior	all																									0.0
49	Dr/Ct/M	Coast	all																							1	3.1	3.1
50	Lw	NE	1200-1800																									0.0
			Totals	5514	41.4	8619	17.1	5460	43.1	3729	19.2	34288	128.8	4890	19.2	55591	81.6	7056	11.9	82909	132.2	28927	12.8	67091	38.7	30	294.0	840.1
																											Risk managed amount	**31.1**
																											Total FIA supported budget	**809**

3.4 Expansion of Orchard Seed Supply Subprogram

This subprogram was established in 1999 to address a need for seed orchard capital investment to meet FGC objectives. For seed planning units (SPU) with insufficient orchard capacity, as determined by the ITAC and CTAC at the time, orchard-expansion investments were initiated through SelectSeed Company Ltd. using competitive seed supply contracts.

SelectSeed is wholly owned by stakeholders through the B.C. Forest Genetics Society, members of whom are on Council. The SelectSeed Board of Directors is elected by Society members (Figure 3). SelectSeed's mission is to "support Forest Genetics Council objectives for the development of seed orchard facilities to meet the provincial demand for high quality, ecologically adapted tree seed through investments, cooperative work with FGC members and effective program management."

Figure 3 Organizational relationships among SelectSeed Ltd., Forest Investment Account, Forest Genetics Council, and the B.C. Forest Genetics Society



3.4.1 Planning

SelectSeed's Business Plan and investments are based on the long-term and annual business plans prepared by the FGC and it's associated committees. Species plans (Appendix 4) contain analyses of projected orchard expansion needs that guide SelectSeed investments. Specific technical advice is sought as required from Species Committees or others with the needed expertise.

3.4.2 Management

Management discretion for spending lies with the SelectSeed Board of Directors,[3] and is limited by the terms of the SelectSeed Multi-Year Agreement with the MOF. Investments in new

[3] The Board is comprised of representatives from the private sector.

orchards follow a request for proposal (RFP) process, with emphasis on both the technical quality of developments and on cost. A comprehensive Business Plan for SelectSeed was approved by the Forest Genetics Council on March 8, 2006.

3.4.3 Activities and Budget

In 2006/07, SelectSeed will continue to focus on the management of 11 long-term orchard agreements covering the development and operation of 14 orchards (Table 5). No new orchard agreements are anticipated during the year.

Activities for the fiscal year include planting 3,116 ramets in orchards, and the propagation and holding of 3,690 ramets. Ramets currently planted in the 14 seed orchards, combined with new planting during 2006/07, will result in approximately 34,900 ramets under management by year end. Total completed size for SelectSeed contract orchards is 35,328 ramets. All grafting and holding work is done through contracts.

Other activities will include program management on behalf of the Forest Genetics Council, including Business Plan and budget development, committee support, managing program development and subprogram interactions, and preparation of mid-term and annual reports.

Spending for 2006/07 is projected at $890,000, of which $867,000 will be FIA supported (Table 4). This is down from a projected $920,000 budget in 2005/06. The reduction is the result of reduced orchard capital development costs and FGC program management costs. FIA costs for this subprogram will continue to drop as new orchards begin seed production and seed sale revenue displaces costs associated with the SelectSeed Multi-Year Agreement.

Table 4 SelectSeed Company Ltd. 2006/07 budget by category

Category	expenses / income
Expenses	
Existing orchard development contracts	620,831
Propagation and holding	39,000
Management and administration (FGC and SelectSeed)	211,500
NSERC Industrial Chair support	10,000
Crop production / seed extraction	8,669
Total Expenditures	$890,000
Income	
Seed sales	8,000
Interest from investments	15,000
Total Income	$23,000
Total MYA support	**$867,000**

Table 5 **Orchards under contract to SelectSeed Company Ltd. as part of the Orchard Expansion Subprogram.**

Seed planning unit					
SPU#	Species	Seed zone	Planned # ramets	# ramets currently established	Location
21	Fdi	NE low	2187	2158	Armstrong - Grandview
37	Fdi	QL	975	789	Vernon
41	Fdi	PG	786	778	Vernon
28	Sx	TO high	1056	1056	Armstrong - Eaglerock
30	Sx	TO low	454	454	Armstrong - Eaglerock
7	Pli	NE low	1000	976	Armstrong - Grandview
10	Pli	TO low	4796	4030	Armstrong - Grandview
12	Pli	PG low	4871	4120	Kettle Valley
12	Pli	PG low	4500	4488	Vernon
16	Pli	TO high	3503	3503	Armstrong - Eaglerock
17	Pli	BV low	3000	2997	Vernon
17	Pli	BV low	3100	3005	Sorrento
18	Pli	CP low	2000	1816	Sorrento
18	Pli	CP low	3100	2684	Kettle Valley
		TOTALS	35,328	32,854	

3.5 Extension and Communication Subprogram

The Extension and Communication Subprogram supports FGC goals and objectives through:

- extension (providing client focused solutions and training to seed users and tree improvement specialists)
- communication (developing and disseminating information on the program and its activities to all FGC target audiences)
- training (fostering support for the education of tree improvement specialists and technologists, including continuing education)

3.5.1 Planning

Extension and communication activities are developed and guided by the FGC Extension Technical Advisory Committee (ETAC). ETAC includes representatives from research, operations, extension, training, and communications. Members are involved with forest gene resource management and the use of improved reforestation materials.

The ETAC extension and communication strategy is based on three broad goals:

1. To work closely with Council and its TACs to coordinate and manage extension efforts in support of Council's provincial forest gene resource management program.
2. To provide information and policy advice to Council on issues related to extension
3. To act as a forum for user feedback.

The committee's strategy outlines key audiences, messages, and delivery mechanisms.

3.5.2 Management

ETAC identifies goals and audiences for extension, communication and education activities, and, with the assistance of an Extension Coordinator with the MOFR – Tree Improvement Branch, develops a business plan. The Coordinator is responsible for the management of ETAC activities, and the coordination of ETAC work in conjunction with Council and other committees of Council. Project ideas or proposals from any interested party are considered.

Projects are undertaken through contract delivery, or through direct delivery by cooperators. Budget development for FIA funds is first done by the ETAC, with final approval by the FGC. Project spending is approved by the ETAC Chair and the FGC Program Manager, and must meet administrative guidelines set out for FIA funds. ETAC reports to Council on activities, progress, and spending at mid-year and year end.

3.5.3 Activities and Budget

The extension and communication budget for 2006/07 is $35,000, plus Ministry of Forests and Range salary support. In-kind, staff time and other contributions by affiliated companies and agencies are additional to this amount. Projects and budgets are summarized in Table 6.

Table 6 Extension and communication projects and budgets for 2006/07

Project	Budget ($)
ETAC meetings	700
TicTalk newsletter	1,500
Publish and print publication on GA induction effects on redcedar cone production	2,000
Interior pollen management workshop	5,500
Print 50 copies of the "Tree Improvement in BC" poster	2,000
Forest genetics and tree improvement field tours (1 coast; 1 interior)	4,000
Colourize reproductive biology diagrams for extension purposes	2,000
Spruce orchard management manual	6,000
Begin development of seed orchard pest management fact sheets and posters	3,000
Extension opportunities (workshops, notes, demo sites, etc.)	8,300
Ministry of Forests and Range salary support	85,000
Total FIA Tree Improvement Program Contribution	**120,000**

3.6 Gene Resource Information Management Subprogram

Gene Resource Information Management Subprogram (GRIM) projects support FGC goals and objectives through the development of gene resource management (GRM) information-management systems to assist seed users, seed producers, and other clients, in planning, production, seed use (registration, storage, selection & use and transfer) and monitoring. Projects

include strategic planning and analysis, resource information management, development of decision support tools, effectiveness monitoring, and training.

3.6.1 Planning

The primary objective of the GRIM Subprogram is to develop a provincial gene resource information management system and framework for the delivery of an effective GRM program. Planning for GRIM projects is carried out by the Gene Resource Management section of the Ministry of Forest and Range Tree Improvement Branch.

3.6.2 Management

The GRIM subprogram is managed by the Gene Resource Management section of the Ministry of Forests and Range, Tree Improvement Branch. The subprogram is supported by the Gene Resource Information Management Steering Committee comprised of Ministry, industry, and academic representatives, and the FGC Program Manager. Significant project changes or re-allocations of funds from the approved Business Plan require approval of the Steering Committee and the FGC Program Manager on behalf of the FGC.

3.6.3 Activities and Budget

Funding is shared between FIA and the Ministry of Forests and Range. Total funding allocated from the FIA Tree Improvement Program will be $50,000 for 2006/07, plus $30,000 from the FIA incremental funding program in support of MPB initiatives. Specific projects are listed in Table 7.

Table 7 Gene Resource Information Management subprogram projects and budget for 2006/07

Project	Budget ($)
1. Strategic Planning and Analysis • Information in support of the development of a provincial forest-tree gene resource management strategy (* MPB FIA Incremental) ▪ Land-based seed plans that will integrate resource management, timber harvest, and forest health information to better understand seed and other gene resource mgt. needs ▪ Business case analysis of gene resource management in the context of new and changing information on climate change, seed transfer, and existing seed supply programs.	40,000
2. Resource Information Management Development and update of genetic resource data sets to meet information management requirements identified from strategic planning and analysis projects.	20,000
3 Gene Resource Information Management Systems SPAR and SeedMap enhancements including the development of system linkages, reports and spatially-derived attribute tables.	10,000
4 Training and Extension On-line Help, tutorials and training materials.	10,000
Total FIA Tree Improvement Program Contribution	**80,000**

3.7 Pest Management Subprogram

The Pest Management Subprogram supports FGC objectives by reducing orchard seed losses to insect and disease pests through research, technical support, and the development of integrated pest management strategies in conjunction with orchard managers and pest management research and extension specialists.

3.7.1 Planning

The Subprogram is guided by a Pest Management Technical Advisory Committee with membership from industry and government orchards, the Canadian Forest Service, universities, and the Provincial Tree Seed Centre. Issues are identified and ranked by the TAC based on the perceived impact on seed losses, and the effect of these seed losses on FGC objectives. Probability of success and alternative pest management options are considered by the TAC when developing priorities. The TAC also makes recommendations to Council regarding subprogram organization and management.

3.7.2 Management

A call for proposals was released to address issues outlined by the TAC. Projects were ranked by the TAC according to impact on the primary pest management issues, and probability of success. Projects were then approved based on the ranking of the TAC, and on available funds.

At the request of the FGC, for the 2006/07 fiscal year, the PMTAC also made a recommendation for FIA incremental funding to be allocated to an additional 5 projects (see Table 8).

The MOFR Tree Improvement Branch manages the financial administration of projects approved by the Pest Management TAC through contracts and agreements with proponents. Significant priorities and changes during the fiscal year will be dealt with through consultation with the TAC and approvals by the FGC Program Manager and the MOFR Tree Improvement Financial Administrator. All projects will report quarterly on spending and at mid-year and year-end on progress.

As set out in an a pest management plan approved by the FGC in 2005, FIA funds will also support salaries for two positions in the MOFR; a Pest Management Research Scientist reporting through the Research Branch, and a Cone and Seed Pest Management Biologist reporting through the Tree Improvement Branch.

3.7.3 Activities and budget

The total Pest Management subprogram budget for 2006/07 is $436,000. In-kind, staff time and other contributions by affiliated companies and agencies are incremental to this amount. Projects and budgets are summarized in Table 8.

Table 8 **Pest Management Subprogram projects for 2006/07. Includes ongoing and incremental FIA-supported projects. Incremental FIA funding support totals $152,000.**

Project	Species impacted	Budget ($)	Products
Seed borne fungal infections (*Fusarium*): Reducing *Fusarium* infections on orchard seed to lower seedling mortality. Determining infection mechanisms.	All	7,000	Final report
Tests of systemic insecticides for cone and seed insect control	all	51,000	Progress report
Projects led by the Pest Management Research Scientist ▪ *Leptoglossus occidentalis* (western conifer seedbug): - Host- and intraspecific-attraction studies (SFU) - Mark-release-recapture studies (UBC-Okanagan) - Bagging studies for damage impact (in-house) ▪ *Dioryctria abietivorella* (Douglas-fir coneworm): - General life cycle (UNBC) - Flight phenology (collaboration with Inland Empire Tree Improvement Coop) - Pheromone optimization ▪ *Conifer adelgids*): Taxonomy and life cycles (UBC-Vancouver)	Pli, Fdi, Fdc, Sx, Lw	140,000	 Progress reports Progress reports Progress report
Contarinia oregonensis (Douglas-fir cone midge); sex pheromone-based management	Fdc, Fdi	21,000	Progress report
Leptoglossus population dynamics	Pli, Fdi	21,000	Progress report
BC cone and seed insect field guide	All	30,000	Progress report
Cone crop monitoring decision support tool	All	10,000	Final report
MOFR seed pest research scientist salary and operating	All	76,000	
Ministry of Forests and Range salary support for applied pest management	All	80,000	
Total FIA Tree Improvement Program Contribution		**436,000**	

3.8 Administration

Administration of the FIA Tree Improvement Program is provided by the Tree Improvement Branch of the MOFR. There are three components to this work:

- the administration of FIA funds allocated to subprograms managed by the Ministry of Forests and Range , including Tree Breeding, OTIP, Extension and Communication, Pest Management, and Gene Resource Information Management,
- the administration of contracts with the University of BC, the University of Victoria, and SelectSeed Company Ltd.,
- support for the business of the FGC, including scheduling meetings, assistance with information distribution, and dealing with queries and planning.

3.8.1 Costs

The costs for MOFR administration are reviewed by the FGC, and a recommendation is made for support under FIA. The administration budget is approved by the FGC in conjunction with other FIA Tree Improvement Program budget items.

3.8.2 Management

Overall program management is done by the FGC Program Manager working for SelectSeed Company Ltd. This work includes planning, coordination of committees, Business Plan development, reporting, correspondence, and representing the FGC in daily business. The MOFR Tree Improvement Branch provides administrative support, overall financial management, assistance with the coordination of FGC business.

3.8.3 Activities and Budget

The 2006/07 budget for the Administration Subprogram is $58,000. This amount includes all program administration costs incurred by the MOFR Tree Improvement Branch. Funding will be split between the ongoing FIA allocation ($43,000) and the incremental FIA allocation ($15,000). The incremental amount will cover additional costs associated with administering incremental FIA projects.

3.9 Incremental projects

Projects listed in Table 9 were approved by the FGC, and are supported through FIA incremental funds allocated to the Tree Improvement Program. Only projects not directly managed through an existing subprogram (listed above) are set out in Table 9. Each project received review through existing FGC advisory committees, or through new steering committees set up to advise on the specific project.

Table 9 Incremental FIA projects for 2006/07. Projects and budgets managed through existing subprograms are also listed under subprograms in sections 3.1 to 3.7.

Project category	Project description	Project budget ($ x 1000)	Delivery mechanism	Project development and reporting process
Enhanced seed production and genetic gain	Enhancing seed orchard production for MPB impacted seed planning units	123	Same as OTIP subprogram	Same as OTIP subprogram
	Progeny and provenance assessments to support long-term genetic gain	448	Same as Breeding subprogram	Same as Breeding subprogram
	Reconnaissance of B+ seed sources of Pli to support operational collections	22	TIB contract	Committee planning / report
Strategic policy and support information for MPB and gene resource management activities	Development of climate change policy for seed deployment and gene resources	30	TIB administration	Same as GRIM subprogram
	Analysis of broadleaf gene resource status and opportunities	30	Research Br. Administration	Broadleaf species committee planning; report
	Strategic planning and analysis	30	TIB administration	Same as GRIM subprogram
Research and information in support of MPB mitigation	Maximizing orchard seedlot inputs and recoveries; parental contributions and sowing efficiencies	200	MOFR / UBC Contribution Agreement	Subcommittee planning and review; reports
	Capacity building in gene resource management at UNBC	150	MOFR / UNBC Contribution Agreement	Chief Forester facilitation; Subcommittee planning and review; reports
	Seedlot response to climate variables; support for seed transfer policy	50	MOFR / UBC Contribution Agreement	Same as Gene Conservation subprogram
	Responding to climate change; designing a multi-species trial to facilitate species migration through seed deployment	20	Research Br. Administration	Subcommittee review; report on experimental design
	Improving applied cone and seed pest management practices	152	TIB administration	Same as Pest Management subprogram
	Improving orchard flower induction techniques for lodgepole pine and Douglas-fir	134	MOFR / Uvic Contribution Agreement	Subcommittee planning; reports
Administration	Incremental administration costs	15		
Unallocated	Reserved for projects opportunities	96		
Total		**$1,500**		

3.10 Budget Summary

The total Forest Investment Account Tree Improvement Program budget allocation is $5.87 million, including $4.27 million in ongoing support, and 1.5 million incremental support associated with Mountain Pine Beetle mitigation (Table 10).

Table 10 Budget summary for Forest Investment Account contributions to subprograms ($ x 1000).

Subprogram	Ongoing	Incremental	Total
Gene Conservation	220	50	270
Tree Breeding	2,100	448	2,548
Operational Tree Improvement Program (OTIP)	686	123	809
Extension and Communication	120	0	120
Gene Resource Information Management	50	30	80
Seed Orchard Pest Management	284	152	436
Administration (Tree Improvement Branch)	43	15	58
Incremental projects (not listed above – see table 9)		682	682
Expansion of Orchard Seed Supply (SelectSeed Ltd.)	867		867
Total FIA Tree Improvement Program Contributions	**4,370**	**1,500**	**5,870**

4.0 Funding and Administrative Mechanisms

This section outlines the agreements through which the Forest Investment Account Tree Improvement Program funds the FGC Business Plan.

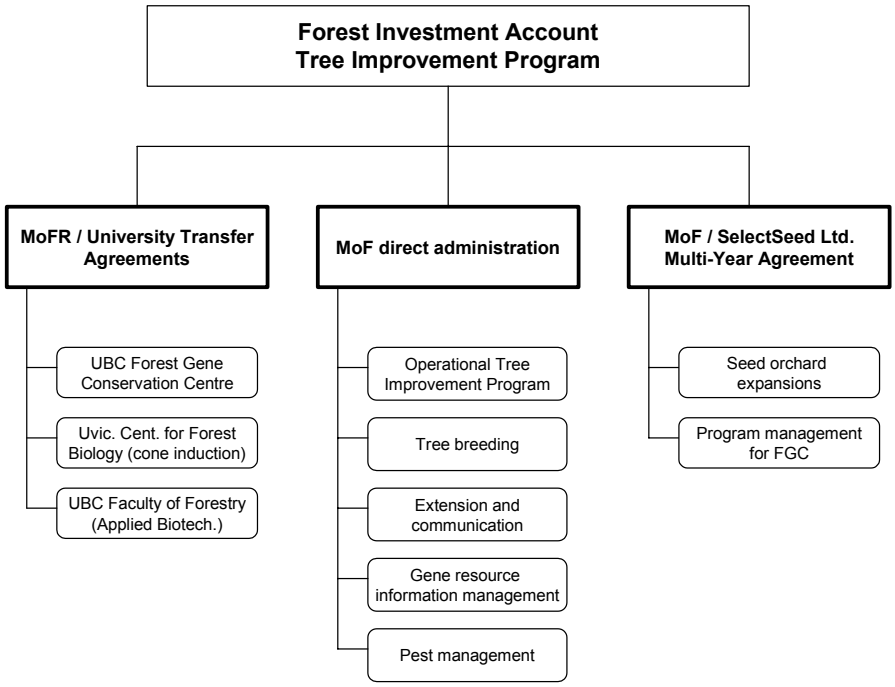
4.1 Funding Agreements

The Forest Investment Account Tree Improvement Program is administered by the Tree Improvement Branch of the Ministry of Forests and Range . FGC Business Plan activities are supported through the following administrative mechanisms:

- MOFR/University of BC Transfer Agreement
- MOFR/University of Victoria Transfer Agreement
- MOFR/SelectSeed Co. Multi-Year Agreement and Transfer Agreement
- MOFR contract
- MOFR direct management and administration

The subprograms associated with each of the mechanisms are shown in Figure 4. Resources from other agencies include in-kind facilities, staff and direct funds. Seed sales from orchards also provide revenue to support seed production. Only Forest Investment Account funding is detailed in this Business Plan.

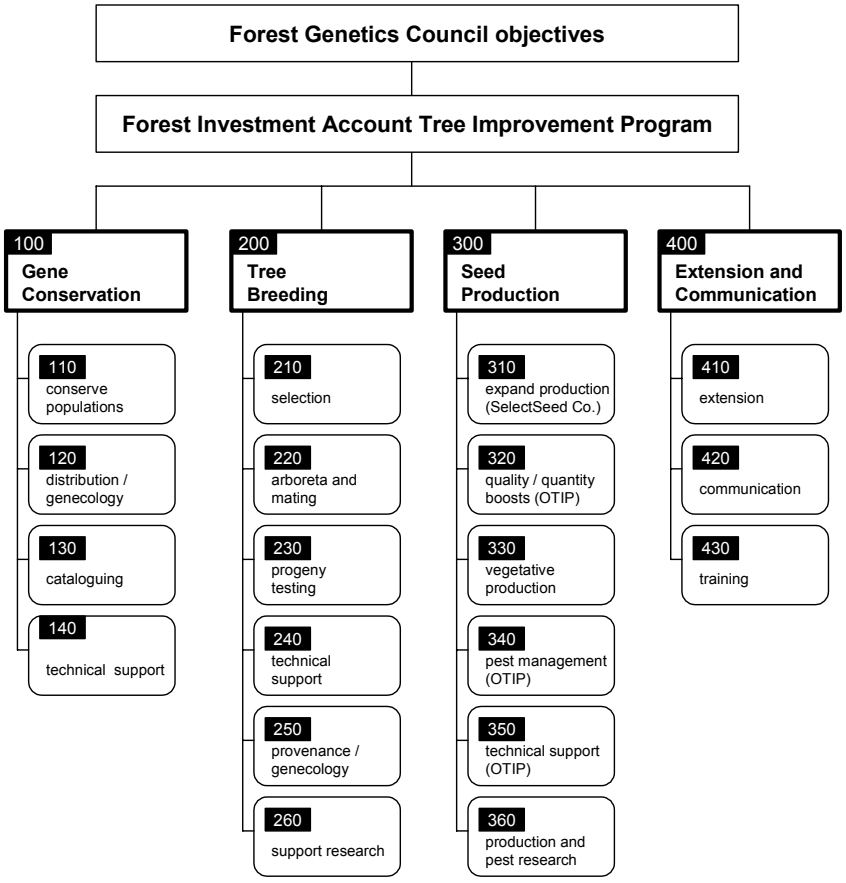
Figure 4 Administrative mechanisms for the delivery of the FIA Tree Improvement Program.



4.2 Monitoring and Reporting

Monitoring progress is an important objective of the FGC program. Therefore, all FIA funded activities are monitored and report on performance relative to criteria. Progress at the provincial level for all FGC activities is measured to determine progress towards long-term objectives. To facilitate monitoring, activities are categorized using a work breakdown structure (Figure 5).

Figure 5 Work breakdown structure for program administration, monitoring and management.



4.2.1 Reporting for the Gene Conservation, Extension and Communication, and Gene Resource Information Management Subprograms

For the Gene Conservation, Extension and Communication, and Gene Resource Information Management subprograms, the TAC chair or subprogram leader will submit written reports on activities and spending to the MOFR Tree Improvement Program Administrator on or before October 15, 2006 and April 20, 2007.

4.2.2 Reporting for the Tree Breeding, OTIP, and SelectSeed Subprograms

Progress for the Tree Breeding, OTIP, and Expansion of Orchard Seed Supply (SelectSeed) subprograms will be reported by spending and key performance indicators (KPI). Progress

towards FGC objectives 1 and 2 (increasing genetic gain, increasing use of orchard seed) will be reported using provincial summaries of orchard seed use and genetic worth.

4.2.3 Reporting for FIA incrementally-funded projects

Progress for projects funded through incremental FIA funds that are managed through existing subprogram processes (Table 10 and Section 3) will report using criteria established for the subprogram. For incrementally funded projects that are not part of an existing subprogram, project leaders will report using criteria established for each project.

4.2.4 Project-Level Reporting

Project activities are organized into the categories identified in the work breakdown structure (Figure 5) (e.g., 320 Quality/Quantity Boosts). Individual projects (e.g., 321 grafting for ramet replacement) will report on KPIs (e.g., number of grafts made) and spending for each year of implementation. Tree Breeding and OTIP project reports will be summarized to formats shown in Tables 2 and 3. Reporting for technical support projects, which are more variable in nature, will use indicators designed for each project. Where actual work or spending differs substantially from that planned, variance reports explaining the reasons will be required of project proponents. Work quality will be periodically audited through Review Committees and site visits.

4.2.5 Provincial-Level Reporting

At the provincial level, total activities and spending will be summarized using KPI and budgets from project-level reports. In addition, actual progress towards FGC objectives 1 and 2 will be summarized across all SPUs using SPU-level reports.

Table 8 identifies the reporting requirements for Tree Breeding and OTIP subprograms.

Table 11 List of reports, responsibilities, distribution and preparation dates for FIA-supported Tree Breeding and OTIP projects.

Type of report	Prepared by	Prepared for	Distribution	Dates due
Interim project status (breeding and OTIP)*	Breeder or OTIP project proponent	MOF program administrators for early FY reallocations	On request	Aug 1
Project level - Breeding	Breeder	MOF Program Administrator	On request	Oct 15 March 31
Project level - OTIP	Project proponent	MOF Program Administrator	On request	Oct. 15 March 31
Mid-Year Progress Report	Program Admin. MOF; FGC Program Manager	FGC; MOFR	FGC; TACs; FGC website	Nov 1
Annual report and progress summary	FGC Program Manager, Program Administrator MOF; project leader contributions	FGC; MOFR Chief Forester; TACs; general distribution	FGC members; TACs; FIA administrators; MOF; general distribution; FGC website	May 30

* Note: The Interim Project Status report is an informal report intended only to identify those projects that are not progressing as planned, and for which funds may be re-allocated.

Appendix 1: Seed Planning Units and Categories

The following table lists seed planning units and their activity category. All provincial SPUs are grouped to one of four categories using a protocol developed by the FGC Strategic Planning Committee. The protocol evaluates SPUs based on the net present value of tree improvement investments, feasibility criteria, uncertainty, opportunities, and seed transfer information needs. Listed SPUs have a Species Plan in Appendix 4, and only include SPUs falling into categories 1 to 3. Annual planting is the 5-year mean of 2002–2006 seedling requests to SPAR. Categorization for SPUs # 6, 8 and 15, are based on an expectation of increased planting with pest resistant material.

Program categories include;

1. Advanced-generation program,
2. First-generation program,
3. Genecology, and
4. No genetics program.

Seed planning unit (SPU)				Annual planting	Program	Value
#	Species	SPZ	Elev. band (m)	(millions)	category	rank
1	Fdc	M	1-700	9.3	1	1
2	Cw	M	1-600	7.5	1	4
3	Hw	M	1-600	1.7	1	10
4	Sx	NE	1000-1500	4.5	1	11
5	Sx	NE	1500-1900	5.4	1	7
6	Ss	M	1-500	1.1	1	3
7	Pli	NE	700-1400	3.7	1	5
8	Pw	M/SM	1-1400	0.3	1	13
9	Ba	M	1-1000	1.4	3	41
10	Pli	TO	700-1400	13.6	1	12
11	Yc	M	1-1100	1.4	1	17
12	Pli	PG	700-1200	30.0	1	2
13	Lw	NE	700-1200	3.0	1	14
14	Sx	PG	600-1200	25.2	1	6
15	Pw	KQ	500-1400	1.1	1	16
16	Pli	TO	1400-1600	5.3	2	25
17	Pli	BV	700-1200	16.4	1	9
18	Pli	CP	700-1100	7.2	1	8
19	Fdc	SM	200-1000	1.4	2	29
20	Pli	NE	1400-2000	3.1	3	38
21	Fdi	NE	400-1000	2.5	1	18
22	Fdi	NE	1000-1600	3.4	2	35
23	Sx/Ss	SM/NST	all	0.8	3	44
24	Hw	M	600-1100	1.0	2	23
25	Sx	EK	750-1700	1.9	1	20
26	Pli	PG	1200-2000	3.2	3	40
27	Cw	SM	200-1000	0.7	3	42
28	Sx	TO	1300-1900	3.3	1	19
29	Pli	EK	1500-2000	1.9	3	39
30	Sx	TO	700-1300	1.2	2	36
31	Fdc	M	700-1200	1.4	2	31

Seed planning unit (SPU)				Annual planting	Program	Value
#	Species	SPZ	Elev. band (m)	(millions)	category	rank
32	Pli	EK	800-1500	2.7	2	30
33	Cw	M	600-1500	1.3	2	27
34	Lw	EK	800-1500	2.0	1	21
35	Sx	BV	500-1200	9.5	1	15
36	Bg	M	1-700	0.1	3	45
37	Fdi	QL	700-1200	0.5	2	34
38	Hw	M north	1-600		Part of SPU 3 Hw M low	
39	Fdi	EK	700-1400	0.9	2	33
40	Sx	PR	650-1200	6.4	2	22
41	Fdi	PG	700-1000	2.2	2	32
42	Sx	PG	1200-1500	2.6	2	26
43	Fdi	CT	600-1200	0.8	2	37
44	Sx	NE	1-1000	1.2	2	28
45	Pli	BB/CHL	All	13.4	3	43
46	Bl	all int.	all	1.9	3	46
47	Bn	M	all	0.1	3	47
48	Aspen/birch/poplar	Interior	-	NA	3	48
49	Alder/poplar/maple	Coast	-	NA	3	49
50	Lw	NE	1200-1800	1.2	2	

Note regarding pending Seed Zones

Seed zones are adjusted from time to time based on new research information, or on administrative needs. For information updates on seed zones, please contact Leslie McAuley of the Ministry of Forests and Range Tree Improvement Branch (leslie.mcauley@gov.bc.ca)

Appendix 2: Forest Genetics Council and Technical Advisory Committee Members

Forest Genetics Council of BC

Name	Affiliation	Representing
Shane Browne-Clayton (Co-Chair)	Riverside Forest Products	Industry Co-Chair (until May30, 2005)
Dr. Dale Draper (Co-Chair)	MOFR, Tree Imp. Br.	Ministry of Forests and Range Co-Chair
Dr. Sally Aitken	University of BC	Coastal Technical Advisory Committee
Dr. John Barker	University of BC	Coast industry orchard owners
Dr. Michael Carlson	MOFR, Research Br.	Interior Technical Advisory Committee
Frank Gundersen	Abitibi Consolidated	Northern interior industry
Dr. Chris Hawkins	University of Northern BC	University
Dr. Gary Hogan	Canadian Forest Service	Canadian Forest Service
Scott King	Lousiana Pacific	Southern interior industry
Vacant		Interior industry orchard owners
Vacant		Coast industry
Al McDonald	BC Timber Sales	Ministry of Forests and Range and BCTS
Mike Madill	MOFR, SI Region	Ministry of Forests and Range
Dr. Alvin Yanchuk	MOFR , Research Br.	Ministry of Forests and Range
Henry Benskin (non-voting rep)	MOFR	Forest Investment Account

Gene Conservation Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dave Kolotelo (Chair)	Ministry of Forests and Range	Jack Woods	SelectSeed Ltd. / FGC
Dr. Sally Aitken	UBC	Alex Woods	Ministry of Forests and Range
Dr. Scott Green	UNBC	Dr. Alvin Yanchuk	Ministry of Forests and Range
Dr. Andreas Hamann	UBC		

Coastal Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dr. Sally Aitken (Chair)	University of BC	David Reid	Ministry of Forests and Range
Patti Brown	Canadian Forest Products	Dr. John Russell	Ministry of Forests and Range
Charlie Cartwright	Ministry of Forests and Range	Dr. Michael Stoehr	Ministry of Forests and Range
Tim Crowder	TimberWest Forests	Annette van Niejenhuis	Western Forest Products
Diane Douglas	Ministry of Forests and Range	Dr. Joe Webber	Ministry of Forests and Range
Dr. John King	Ministry of Forests and Range	Dr. Chang-yi Xie	Ministry of Forests and Range
Dave Kolotelo	Ministry of Forests and Range	Dr. Alvin Yanchuk	Ministry of Forests and Range
Diane Medves	Weyerhaeuser		

Interior Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dr. Michael Carlson (Chair)	MOFR, Research Branch	Al McDonald	BC Timber Sales Ltd.
Dave Basaraba	Tembec Ltd.	Anna Monetta	MOFR, NI Region
Keith Cox	MOFR, Tree Imp. Branch	George Nicholson	Riverside Forest Products
Vince Day	Canadian Forest Products	Greg O'Neill	MOFR, Research Branch
Hilary Graham	Pacific Regeneration Technologies	Doug Perdue	Dunkley Lumber
Dr. Chris Hawkins	University of Northern BC	David Reid	MOFR, Tree Imp. Branch
Barry Jaquish	MOFR, Research Branch	Alistair Schroff	Burns Lk. Community Forest
Dave Kolotelo	MOFR, Tree Imp. Branch	Chris Walsh	MOFR, Tree Imp. Branch
Tim Lee	Vernon Seed Orchard Co.	Bob Johnson	Tolko Industries
Mike Madill	MOFR, SI Region		

Extension Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dr. Chris Hawkins (Chair)	UNBC	Tia Heeley	Vernon Seed Orchard Co. Ltd.
Dr. Michael Carlson	MOFR, Research Branch	Roger Painter	MOFR, Tree Imp. Branch
Charlie Cartwright	MOFR, Research Branch	Jill Peterson	MOFR, Research Branch
Keith Cox	MOFR, Tree Imp. Branch	Doug Stables	Global Strategy Inc
Tim Crowder	TimberWest	Don Summers	DWSummers & Co
Diane Douglas	MOFR, Tree Imp. Branch	Kathie Swift	FORREX
Peter Forsythe	Winton Global	Dave Trotter	Ministry of Agriculture and Lands
Lauchlan Glen	Glenviron Consulting	Jack Woods	Forest Genetics Council
Hilary Graham	Pacific Regeneration Technology		

Pest Management Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dr. Robb Bennett (Chair)	MOFR, Tree Imp. Branch	Dave Kolotelo	MOFR, Tree Imp. Branch
Jim Corrigan	MOFR, Tree Imp. Branch	Dr. Staffan Lindgren	University of Northern BC
Tim Crowder	TimberWest Forest Ltd.	David Reid	MOFR, Tree Imp. Branch
Dan Gaudet	Vernon Seed Orchard Company	Dr. Ward Strong	MOFR, Research Branch
Peter de Groot	Canadian Forest Service	Jack Woods	Forest Genetics Council

Appendix 4: Species Plans

Species plans present information for seed planning units with active or planned breeding programs, seed orchards, or genecology work, including SPUs that are not supported through FIA Tree Improvement Program funding. Information presented includes breeding strategy (where applicable), seed orchard production forecasts, gain forecasts, historic seed use, seed in storage, gene conservation status, and genecology/seed transfer projects. The plans are organized by species.