Forest Genetics Council of BC
Business Plan 2005 – 2006

Compiled and edited by

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FGC Program Manager

Message from the FGC Co-Chairs

We are pleased to present the 2005/06 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.

The new *Forest and Range Practices Act* and the *Chief Forester Standards for Seed Use* were completed, and will be phased in over the coming year The Standards will guide seedlot selection and seed transfer. Protocols are also set out for calculating seedlot statistics, determining parent-tree breeding values, and registering parent trees. This document is supported by a report prepared under the aegis of the FGC that outlines methods for estimating parental gamete contributions to seedlots and vegetative lots.

The new Standards consolidate many existing policies and guidelines to a single comprehensive document. From an operational perspective, the *status quo* is maintained in most areas, however, additional flexibility and associated cost savings are built in for important areas such as seedlot choice and seed transfer.

While the Chief Forester Standards provide a regulatory framework for Seed Use, there are other challenges facing the FGC. Consolidation and staff changes in the forest industry are changing the face of forestry in BC. This will bring new expectations and new ideas. Breeding, seed orchard, and tree improvement extension activities must also adapt to the increased focus on obtaining value from timberland investments within the context of stewardship expectations on Crown lands. Priorities in the coming year include:

- Effective linkage of breeding and seed orchard programs to ensure breeding gains are efficiently transferred to the land base, and
- Better understanding of gene conservation needs, and responses to climate change through seed transfer adjustments.

Provincial seed orchard production continues to increase. However, challenges with obtaining adequate seed from lodgepole pine orchards remain the largest single impediment to achieving Council gain and seed-use objectives. Council support for increased pest management research and operational control will assist in this area.

The massive bark beetle infestation impacting interior lodgepole pine will create additional challenges for seed production. Provincial and federal response initiatives will require seed and information, and staff working in this area will be challenged to provide both. We are confident that Council, the Technical Advisory Committees, and all co-operators will meet these challenges.

On behalf of the Forest Genetics Council, we thank all those on affiliated committees for their co-operation and hard work over the last year.

Shane Browne-Clayton, RPF
FGC Co-chair
Riverside Forest Products Ltd.

Dr. Dale Draper
FGC Co-chair
Ministry of Forests

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 2, 2005

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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 (MOF), 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 them. As stated in the FGC Strategic Plan for the period 2004 to 2008, Council's goal and objectives 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 MOF leads tree breeding activities, while private industry and the MOF manage seed orchards for the operational production of reforestation materials. Universities, MOF 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.

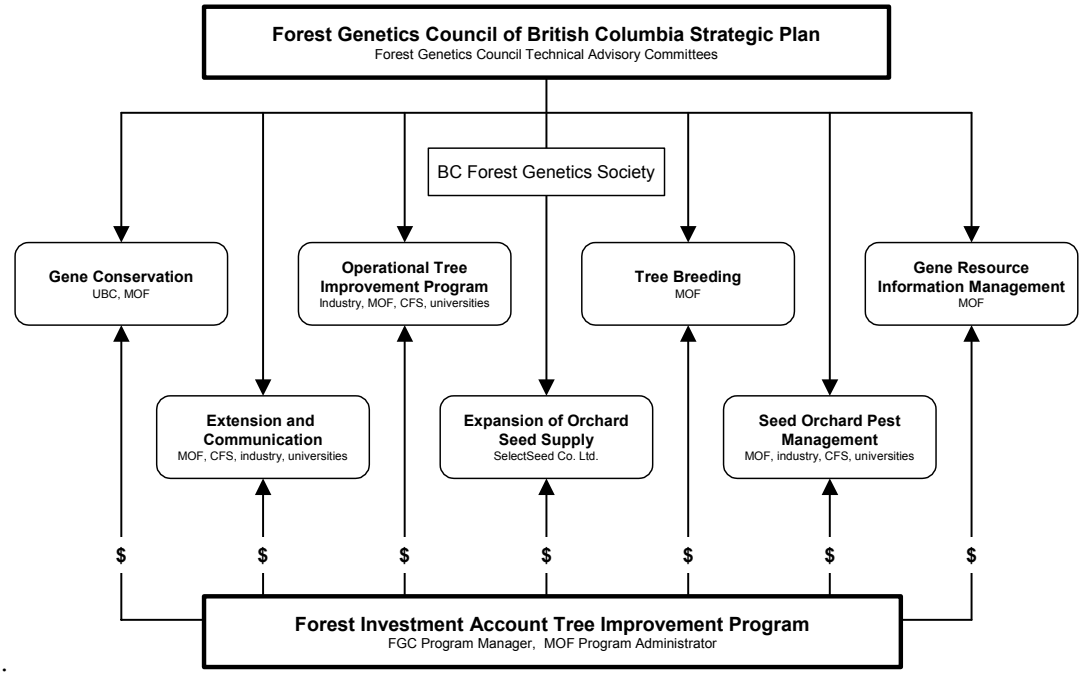
FIA investments are guided by the Forest Investment Council, and administered by the Ministry of Forests (MOF). The MOF has decision-making authority with respect to FIA expenditures, and with assistance from other provincial government ministries, establishes objectives and delivery standards.

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 MOF 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.

In addition to FIA investments in gene resource management, MOF 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.



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2.0 Process for Business Plan Development

2.1 The Role of Council and its TACs

FGC members, representing the Ministry of Forests (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.

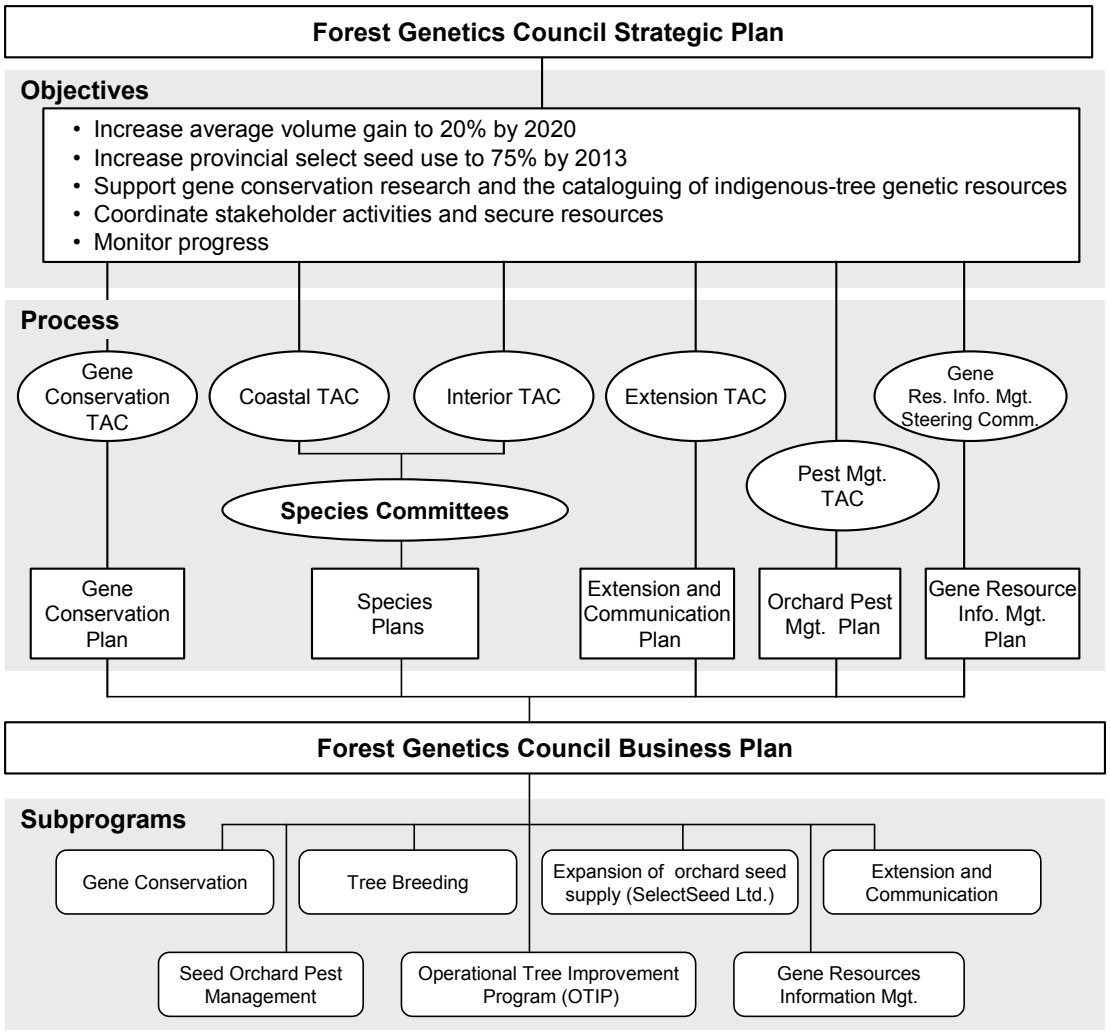
The MOF Tree Improvement Branch, with input from the FGC develops activities and budgets for program administration.

Based on criteria set by the Interior and Coastal TAC's, SelectSeed Company Ltd. (SelectSeed) develops a business plan for the management of new orchards established to meet FGC objectives.

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, development of the FGC Business Plan, 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, the management authorities for each subprogram 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

This section describes how subprograms are planned and managed, and the major activities and budgets for each subprogram. Appendix 1 contains a summary of subprograms and budgets.

3.1 Gene Conservation Subprogram

Gene conservation activities monitor and make recommendations to the gene pool needed for species to adapt to future environmental conditions, and ensure that genetic resources are maintained for future generations.

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 will provide expertise, research, and strategic planning related to gene conservation, and will evaluate levels of protection of genetic diversity.

3.1.2 Management

The Centre receives funding through a Contribution Agreement with the Ministry of Forests 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. Technical direction is reviewed through a Scientific Advisory Committee.

3.1.3 Activities and Budget

The Forest Gene Conservation Centre 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 2005/06 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, and other conservation projects. Table 1 contains a Centre budget for 2005/06 FIA-funded activities. In-kind contributions from UBC will include staff time, lab and office space, and other support. Industry and MOF contributions will include staff time and logistical support for specific projects. Other funding is leveraged through an NSERC Strategic / BIOCAP Canada grant.

Table 1 **Centre for Forest Gene Conservation budgets for 2005/06, by project. Budgets include only activities funded by the Forest Investment Account.**

Project	Budget ($)	Products
Cataloguing and documenting in situ protection	32,000	Ground truthing *in situ* conservation status:
Theoretical framework document(s)	3,000	1 draft report
Sampling strategies and SPZs	1,000	2 scientific papers to be published
Markers and theory for measuring diversity	9,000	1 final report
Whitebark pine diversity and conservation	12,000	1 final report on genecology, inbreeding and *ex situ* seed storage
Genetic structure of minor species	29,500	1 progress report on Pacific dogwood 1 progress report on Garry oak
Climate change and gene conservation	35,000	2 progress reports; revising SPU boundaries based on climate change, and natural regeneration in ecotones impacted by climate change
Other expenses		
Research associate	71,390	
Extension	6,734	100 clients serves / 1 website maintained
CFGC Expenses (office, computing)	9,900	
Subtotal	**209,524**	
5% UBC overhead	10,476	
Total approved budget	**220,000**	

3.2 Tree Breeding Subprogram

The Tree Breeding Subprogram focuses on the continued improvement 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 no longer being made, as all breeding programs have advanced substantially from that point. The Subprogram also includes applied genecology work by MOF geneticists to support the information needs of seed planning unit[2] (SPU) programs as described in Species Plans.

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 MOF 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.

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

The budget for the Tree Breeding Subprogram was developed for individual SPU by Species Committees in the fall of 2004, and an approximate total of 2.4 million dollars was identified as the necessary sum to carry out all activities. This budget was then adjusted to meet the total expected Subprogram budget allocation by the Manager, Forest Genetics, MoF Research Branch, with input from MoF tree breeders, the FGC Program Manager and the MOF Tree Improvement Branch Director. Final programs and budgets were reviewed and approved by the FGC on March 2, 2005.

3.2.2 Management

The MOF manages Tree Breeding Subprogram activities, and reports to the FGC. The Manager of Forest Genetics, MOF 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 2005/06 budget for the Tree Breeding Subprogram was estimated and approved at $2,200,000; an increase of $76,000 from 2004/2005. Table 2 contains approved budgets and key performance indicators (KPI) for breeding activities by SPU. Approximately of $1,003,000 of the total budget will cover salary costs. In addition, approximately $100,000 will be risk-managed for lodgepole pine provenance test age-33 measurements. 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 the establishment of second-generation progeny tests for lodgepole pine in the Nelson, Thompson-Okanagan, and Central Plateau seed zones, as well as new tests for white pine (coast and interior). Other second-generation testing will proceed with redcedar, western hemlock, and Sitka spruce in the Maritime seed zone. This year will see the measurement of test series for redcedar, hemlock, Douglas-fir, Sitka spruce, and white pine on the coast, and for spruce, larch, and lodgepole pine in the interior. A large interior spruce genecology/climate-change study will also be planted (128 seed sources on 16 test sites of a wide climatic amplitude) initiated using FIA funds and financial support from the Canadian Climate Change Adaptation Research Network (C-CAIRN).

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 MOF 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.

3.3.2 Management

The MOF 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 MOF Tree Improvement Program Administrator in consultation with the appropriate TAC and the FGC Program Manager. All projects report on key performance indicators to enable tracking of the planned activities.

3.3.3 Activities and Budget

The 2005/06 OTIP budget is $600,000, with a further $17,100 in approved projects to be funded through risk management (expected project under-spending during the year). This is a total budget reduction of $67,000 from 2004/05. Table 3 contains approved OTIP budgets and KPI for all seed planning units.

Table 2 2005/06 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 series designed / sown		# of progeny tests establ./prep.		# of progeny tests maintained		# of progeny tests measured		# tests assess. 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	30	2	90	3			100	3					13	30	6	18							3	2													58
2	Cw	M	1-600	90	0	170	5	1,200	3	150	14			3	20	17	30	8	30	2	0	8	5																	107
3	Hw	M-S	1-600	60	1	60	1	290	2	120	6					24	35	6	20			2	1									2	6	14	6	3	2	1	5	0	0	85
4	Sx	NE	800-1500							75	2																							2	2	2	2			2	0	6
5	Sx	NE	1500-1900							75	2																														2
6	Ss		1-500							60	6	5	12	3	25	18	42	6	22					1																107
7	Pli	NE	700-1400											3	30																									30
8	Pw		1-1400							60	8	3	15	3	15	12	18	6	18					1																74
9	Ba	M	< 1000																													2	6	11	6					12
10	Pli	TO	700-1400											3	30	4	8									8	8													46
11	Yc	M	1-1100	40	0	160	5	500	3	50	6					16	12					3	2	6	8	6	9	6	6					7	12	7	12			75
12	Pli	PG	700-100													3	6																							6
13	Lw	NE	500-1200					2,000	17	100	2					3	8	2	12			3	0	3	10	3	2													51
14	Sx	PG	600-1200									1	8	4	22	8	20	4	18			4	0	4	30	2	3			2	7	8	45	3	5	3	5			163
15	Pw	KQ	500-1500											2	14	1	4							30	2															20
16	Pli	TO	1400-1600																																					-
17	Pli	BV	700-1200																																					-
18	Pli	CP	700-1100									1	8	3	27																									35
19	Fdc	SM	200-1000	15	3	15	2							3	30																				5	10				45
20	Pli	NE	> 1400																																					-
21	Fdi	NE	400-1000							100	2					4	20	0	0			4	0	1	4	88	4							1	3	1	4			37
22	Fdi	NE	1000-1600							100	2																													2
23	Sx/Sxs	SM/NST	all	combined with SPU #6																																				
24	Hw	M	600-1100	30	1							1	1	4	25	4	6																							33
25	Sx	EK	750-1700													2	17																	1	2	1	4			23
26	Pli	PG	> 1200																																					-
27	Cw	SM	200-1000													6	6	3	10			2	2																	18
28	Sx	TO	1300-1900																																					-
29	Pli	EK	> 1500																																					-
30	Sx	TO	700-1300																																					-
31	Fdc	M	700-1200																																			0	0	-
32	Pli	EK	800-1500															2	10																					10
33	Cw	M	> 600													6	6	2	5			2	2																	13
34	Lw	EK	800-1500							100	2					3	10	3	18			3	0	2	10															40
35	Sx	BV	500-1200													3	10																							10
36	Bg	M	1-700																																					-
37	Fdi	QL	700-1200																																					-
38	Hw	M-N	< 600																																					-
39	Fdi	EK	700-1400																																					-
40	Sx	PR	650-1200					5,000	10							4	10																							20
41	Fdi	PG	700-1000																																					-
42	Sx	PG	1200-1550																																					-
43	Fdi	CT	600-1200																																					-
46	Bl	Prov	all																													2	6			1	1			7
49	Dr,Mb,C	M/SM	all	750	9	350	7	600																								2	40	4	7				2	0	63
			TOTAL	1,015	16	845	23	9,590	35	1,090	55	11	44	31	238	151	298	48	181	2	0	31	11	48	64	110	28	6	6	2	7	16	103	43	43	23	40	1	5	4	0	1,197
																																						Salaries				1,003
																																						Total:				2,200

Table 3 2005/06 budgets ($ x 1000) and KPI by seed planning unit for Operational Tree Improvement Program (OTIP) projects. Category numbers relate to Work Breakdown Structure (Figure 5). See species plans (Appendix 4) for more program detail.

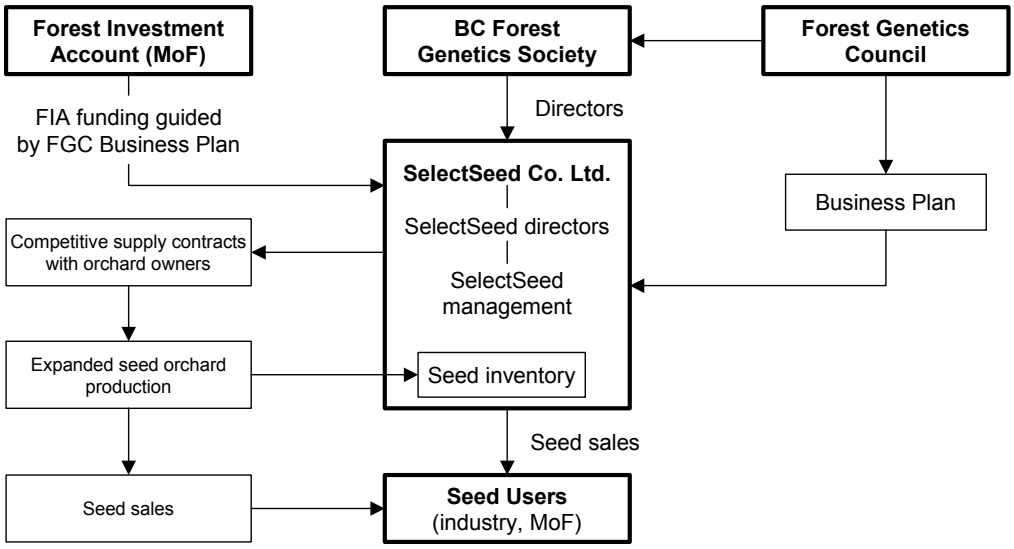
Seed Planning Unit				*320 Quality / Quantity Boosts*												*330 Cuttings*		*340 Pest Management*						*350 Tech Sup.*		Total $ x 1000
				321		322		323		324		325		326		327		331		341		342		343				
				# ramets grafted		# ramets in holding		# ramets replaced in orchards		# ramets rogued in orchards		# ramets treated with SMP or CP		# ramets induced for cone production		# ramets managed in orchards		# donor plants for cutting prod.		# ramets treated for insects		# ramets treated for disease		# 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	3600	5.2	1959	5.3	814	4.2	215	3.6	930	15.2	1550	5.0	5860	12.9			5860	9.1					4	4.2	64.8
2	Cw	M	< 600	22	0.2	2676	3.9	3	0.1			507	6.6	527	1.0	4744	5.4			1497	2.6					1	4.2	23.9
3	Hw	M	< 600									961	4.3	185	0.8	1361	3.5			761	0.4					1	3.7	12.7
4	Sx	NE	1000-1500	416	2.5	534	2.2	129	1.7	842	24.2	516	1.1	700	3.4	257	0.7			6390	5.3	2608	0.8	2608	1.4	3	44.1	87.5
5	Sx	NE	>1500	458	2.9	508	2.0	150	2.0	600	17.9	415	1.0	750	3.6	213	0.5			5267	5.1	2188	0.8	1345	0.8			36.6
6	Ss	M	< 750	39	0.3	119	0.2	15	0.2			300	2.6			747	1.6	747.0	0.6	842	1.0							6.5
7	Pli	NE	< 1400	161	1.5			120	0.3			5523	10.0			1092	1.8			12546	9.1	3865	2.2	2088	1.1	2	46.3	72.2
8	Pw	M/SM	< 1000	100	0.8					15	0.1	950	7.6							950	2.5			200	0.2			11.3
9	Ba	M	< 1000																									-
10	Pli	TO	< 1400	20	0.3			20	0.1	30	0.9	6529	7.9			2251	4.8			7051	9.1	7051	3.7	7051	2.7			29.3
11	Yc	M	<1200					451	1.0							9418	5.3	14462	14.5	12583	1.3					4	26.4	48.6
12	Pli	PG	<1200									3453	13.9	380	1.5	1440	2.2			10090	6.1	1440	1.0	8658	3.6			28.2
13	Lw	NE	< 1300	578	3.6	85	0.5	93	1.3			664	1.1			395	0.8			3399	3.8	1573	0.5					11.5
14	Sx	PG	< 1200													3000	3.7			8000	1.6			8000	2.5			7.8
15	Pw	KQ	<1400	60	0.9	310	1.7	23	0.3			2849	4.9			589	1.2			5814	10.4	2339	0.7	20	0.8			21.0
16	Pli	TO	> 1400									191	1.0			600	0.6			638	2.9	638	1.9	638	1.6	1	3.2	11.3
17	Pli	BV	<1200									1600	1.5	430	1.6	1600	2.2			10250	6.2	1600	1.0	8650	2.5			15.1
18	Pli	CP	<900 *									4000	9.7	380	1.1	1000	1.4			5300	4.2	1000	0.7	4300	1.3			18.4
19	Fdc	SM	200-1000													1037	2.1											2.1
20	Pli	NE	> 1400																									-
21	Fdi	NE	< 1000									2114	3.3	200	1.5					2174	3.2	2174	0.4	2174	0.9			9.3
22	Fdi	NE	> 1000	100	0.8	29	0.2	38	0.5			200	1.9			384	0.8			3181	1.5	1526	0.5	1526	0.8		4.1	11.1
23	Sx/Ss	SM/NST	all																									-
24	Hw	M	> 600					337	5.1											588	0.8							5.8
25	Sx	EK	< 1700																	1699	0.9	1699	0.5	1699	0.9			2.3
26	Pli	PG	> 1200																									-
27	Cw	SM	200-1000																									-
28	Sx	TO	1300-1850									370	3.1	500	2.7	125	1.0			1038	3.8	1038	0.4	1038	1.6			12.6
29	Pli	EK	> 1500																									-
30	Sx	TO	< 1300																									-
31	Fdc	M	> 700																	100	1.5							1.5
32	Pli	EK	< 1500	250	1.9	348	1.7	59	0.8			150	1.2			2	0.1			5490	2.5	1830	0.6	1830	1.0			9.7
33	Cw	M	> 600																									-
34	Lw	EK	800-1500																	2496	4.2	1378	0.4	1378	0.7			5.4
35	Sx	BV	< 1200	890	5.4	799	2.8	36	0.5	411	2.2	526	1.4			152	0.4			4365	4.3	2244	0.6	2244	0.8			18.4
36	Bg	M	< 700																									-
37	Fdi	QL	< 1200									300	2.2	300	1.2					351	1.4			351	1.0			5.8
39	Fdi	EK	all																									-
40	Sx	PR	650-1200									2723	1.1			257	0.8			2980	1.1	2723	1.6	2980	0.3			4.8
41	Fdi	PG	< 1000									300	2.2	300	1.2					540	1.8			540	1.0			6.2
42	Sx	PG	> 1200							630	3.3									347	0.4	347	0.3	347	0.3			4.1
43	Fdi	CT	< 1100									600	4.3	600	2.4					1050	2.6			1050	1.0			10.4
			Totals	6694	26	7367	20	2288	18	2743	52	36671	109	6802	27	36524	54	15209	15	123637	110.7	39261	18.4	60715	28.9	16	136.3	617.1
																											Risk managed amount	**17.1**
																											Total FIA supported budget	**600**

3.4 Expansion of Orchard Seed Supply Subprogram

Seedling demand and orchard capacity needs for seed planning units (SPU) are estimated by Species Committees. For SPUs with insufficient orchard capacity, expanded seed supply needs are identified and made known to stakeholders. If no company or agency is willing or able to establish the needed orchards, then, following approval by the FGC, SelectSeed Company Ltd. will expand capacity through competitive seed supply contracts.

SelectSeed is wholly owned by stakeholders through the B.C. Forest Genetics Society, members of whom are on Council. Members of the SelectSeed Board of Directors are elected by the Society (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 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 2, 2005.

3.4.3 Activities and Budget

In 2005/06, SelectSeed will focus on the management of 11 long-term orchard agreements covering the development and operation of 14 orchards (Table 4). No new orchard agreements are anticipated during the year.

A total of 2,200 ramets are expected to be planted in orchards during the fiscal year. Propagation and holding for orchard expansion will continue, with approximately 3,640 grafts to be completed and held for orchard development. Ramets currently planted in the 14 seed orchards, combined with new planting during 2005/06, will result in approximately 34,400 ramets under management. Total completed size for SelectSeed contract orchards will be 35,984 ramets. All grafting and holding work will be done through contracts.

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

Spending for 2005/06 is projected to be $920 thousand, of which $890 will be from the FIA. This is down from a projected $950 thousand in 2004/05, and $1.29 million in 2003/04. These reductions are the result of reduced orchard capital development costs relative to the previous fiscal years. FGC program management costs have also gone down. 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.

[3] The Board is comprised of representatives from the private sector, including one FGC Co-Chair.

Table 4 **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	2114	Armstrong - Grandview
37	Fdi	QL	975	787	Vernon
41	Fdi	PG	786	749	Vernon
28	Sx	TO high	1052	1052	Armstrong - Eaglerock
30	Sx	TO low	454	454	Armstrong - Eaglerock
7	Pli	NE low	1000	988	Armstrong - Grandview
10	Pli	TO low	4796	4277	Armstrong - Grandview
12	Pli	PG low	4871	4473	Kettle Valley
12	Pli	PG low	4500	4228	Vernon
16	Pli	TO high	3473	3189	Armstrong - Eaglerock
17	Pli	BV low	3000	2876	Vernon
17	Pli	BV low	3100	2982	Sorrento
18	Pli	CP low	2000	1980	Sorrento
18	Pli	CP low	3100	2835	Kettle Valley
		TOTALS	35,294	32,984	

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 ETAC–appointed Coordinator, 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 can be submitted to ETAC for consideration.

Projects are undertaken through contract delivery, or through direct delivery by cooperators. Budget development for FIA funds is first done by the ETAC, and finally approved 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 2005/06 is $35,000, plus Ministry of Forests 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 5.

Table 5. Extension and communication projects and budgets for 2005/06

Project	Budget ($)
Publication: 1 TicTalk newsletter	2 000
Extension planning workshop and products	8 000
Printing 100 copies of the "*Reproductive Biology of Lodgepole Pine"*	2 000
Publish 3 Extension Notes	4 500
Forest genetics and tree improvement field tours (1 coast; 1 interior)	3 000
ETAC meeting	500
Extension opportunities (workshops, notes, demo sites, etc.)	15 000
Ministry of Forests salary support	85 000
Total FIA Tree Improvement Program Contribution	**120 000**

3.6 Gene Resource Information Management Subprogram

The Gene Resource Information Management Subprogram (GRIM) develops projects that support operational forest tree gene resource management (GRM) and planning, best practices, and conservation. Projects supported include the development of GRM standards, strategic

analyses (forest productivity and health), effectiveness evaluation, and monitoring tools, as well as computer-based information systems, data repositories, and registries.

3.6.1 Planning

The primary objective of the GRIM Subprogram is to develop a provincial gene resource management framework for the delivery of an effective land-based GRM program that meets both short and long term gene resource management objectives. GRM objectives (stand and landscape level) are identified through: legislation and policy (Forest Planning and Practices Regulation – use of seed; Chief Forester's Standards for Seed Use (registration, storage & testing, selection & use and transfer); land use planning (genetic resource features); timber supply assumptions (genetic gain & select seed use); tree improvement, tree breeding and genecology (species plans); and, gene conservation strategies.

3.6.2 Management

The GRIM Subprogram is managed by the headquarters' gene resource management section of the Ministry of Forests Tree Improvement Branch. The Gene Resource Information Management Steering Committee develops multi-year subprogram plans, annual budgets and activities. The Steering Committee is comprised of ministry, industry and academic (UBC Centre for Forest Gene Conservation) 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.

3.6.3 Activities and Budget

Funding is shared between FIA and the Ministry of Forests. Total funding allocated from the FIA Tree Improvement Program will be $50,000 for 2005/06. A key initiative is the development of land-based species plans to aid in forecasts of seed production and genetic gain estimates for use by field foresters and timber supply analysts. Current forecasts are based on 5-year average seed use history (seedling requests). Land-based species plans will draw seed need information from harvest and silviculture planning activities.

Other projects include; 1. Further development of SPAR[4] (Parent Tree registry and on-line seed registration) and SeedMap, 2. A provincial Seed Planning zone (SPZ) business case analysis; including development of a SPZ Resource Information Management Plan to address biogeoclimatic ecological classification (BEC) linkages and, 3. SPAR training and extension.

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

[4] Seed Planning and Registration System

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.

For the 2005/06 fiscal year, Council approved a recommendation from the TAC to re-organize the delivery of pest management activities. Recommendations included the delivery of operational control, applied support, and research activities. Operational control will be the responsibility of orchard managers, with some financial support through approved OTIP projects. Applied support will be delivered by pest management specialists from the MOF Tree Improvement Branch, and will include extension, assistance with pest management strategies, and pesticide registrations, and applied trials. Research delivery will be extended beyond the current call for proposals, with the financial support for, and recruitment of, a research scientist within the Ministry of Forests Research Branch. The scientist will be responsible for delivering a comprehensive seed pest research program. It is anticipated that the current call-for-proposals system will be phased out after the 2005/06 fiscal year, in favour of more directed research led by the MOF scientist.

3.7.2 Management

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

The MOF Tree Improvement Branch administers projects approved by the Pest Management TAC through contracts 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 MOF Tree Improvement Program Administrator. All projects will report quarterly on spending and at mid-year and year-end on progress.

Recruitment of a scientist within the MOF will be led by the Director, Research Branch during the fiscal year. This position will report to the Manager, Forest Genetics within the Research Branch, and work with the Pest Management TAC in the preparation of future annual workplans and research budgets.

3.7.3 Activities and budget

The total Pest Management subprogram budget for 2005/06 is $250,000. In-kind, staff time and other contributions by affiliated companies and agencies are incremental to this amount. Projects and budgets are summarized in Table 6.

Table 6. Approved Pest Management Subprogram projects for 2005/06

Project	Species primarily impacted	Budget ($)
MOF seed pest research scientist salary and operating	All	83 308
Conifer seed bug (*Leptoglossus occidentalis*): Damage control methods.	Sx, Lw, Pw, Fdi	11 539
Seed borne fungal infections (*Fusarium*): Reducing *Fusarium* infections on orchard seed to lower seedling mortality. Determining infection mechanisms.	All	7 263
Tests of systemic insecticides for cone and seed insect control	all	35 326
Fir coneworm (*Dioryctia abietivorella*): Identification of an effective sex pheromone lure and the demonstration of its efficacy in traps for monitoring coneworm populations in BC seed orchards (continued project)	Fdi, Fdc, Sx	4 725
Fir coneworm (*Dioryctia abietivorella*): Identification of an effective sex pheromone lure and the demonstration of its efficacy in seed orchards (continued project)	Fdi, Fdc, Sx	24 839
Ministry of Forests salary support for applied pest management	All	83 000
Total FIA Tree Improvement Program Contribution		**250 000**

3.8 Administration

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

- the administration of subprograms managed through the Ministry of Forests, including Tree Breeding, OTIP, Extension and Communication, Pest Management, and Gene Resource Information Management subprograms,
- the administration of contracts for the Gene Conservation and Orchard expansion subprograms with the University of BC and SelectSeed Company Ltd., respectively,
- 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 MOF administration are reviewed by the FGC, and a recommendation is made for support under the 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 MOF Tree Improvement Branch assists in this work by providing information services, administrative support, and FGC business coordination.

3.8.3 Activities and Budget

The 2005/06budget for the Administration Subprogram is $40,000. This amount includes all program administration costs incurred by the MOF Tree Improvement Branch.

3.9 Subprogram Budget Summary

The total budget for the Forest Investment Account Tree Improvement Program is $4.37 million (Table 7).

Table 7 Budget summary for Forest Investment Account contributions to subprograms.

Subprogram	Budget ($)
Gene Conservation	220 000
Tree Breeding	2 200 000
Operational Tree Improvement Program (OTIP)	600 000
Extension and Communication	120 000
Gene Resource Information Management	50 000
Seed Orchard Pest Management	250 000
Administration (Tree Improvement Branch)	40 000
Subtotal	**3 480 000**
Expansion of Orchard Seed Supply (SelectSeed Ltd.)	890 000
Total FIA Tree Improvement Program Contributions	**4 370 000**

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.

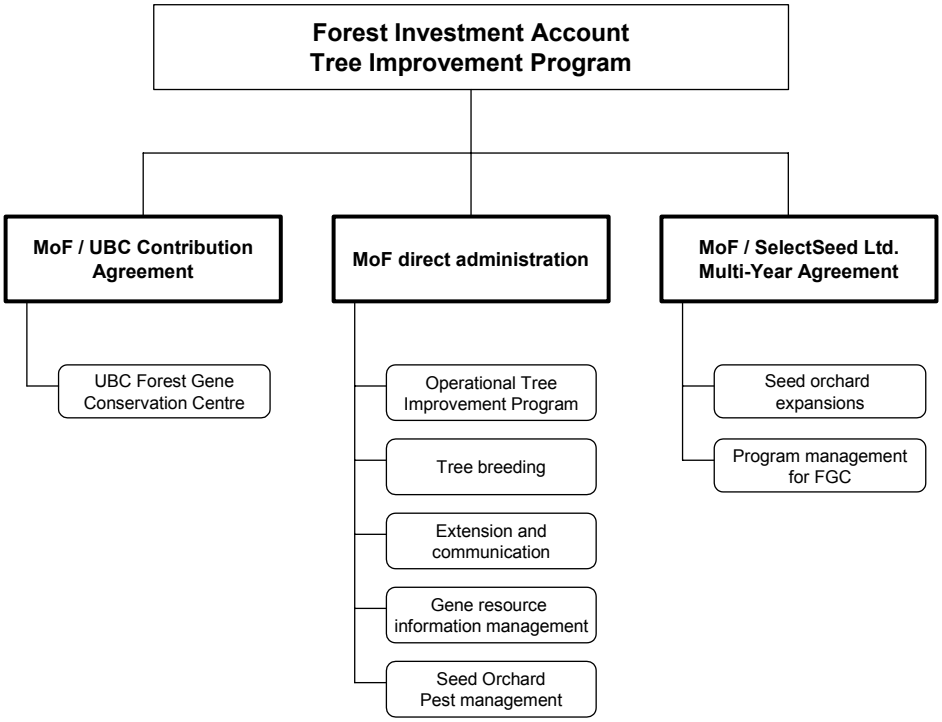
4.1 Funding Agreements

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

- MOF/University of BC Contribution Agreement
- MOF/SelectSeed Co. Multi-Year Agreement and Transfer Agreement
- MOF direct 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.

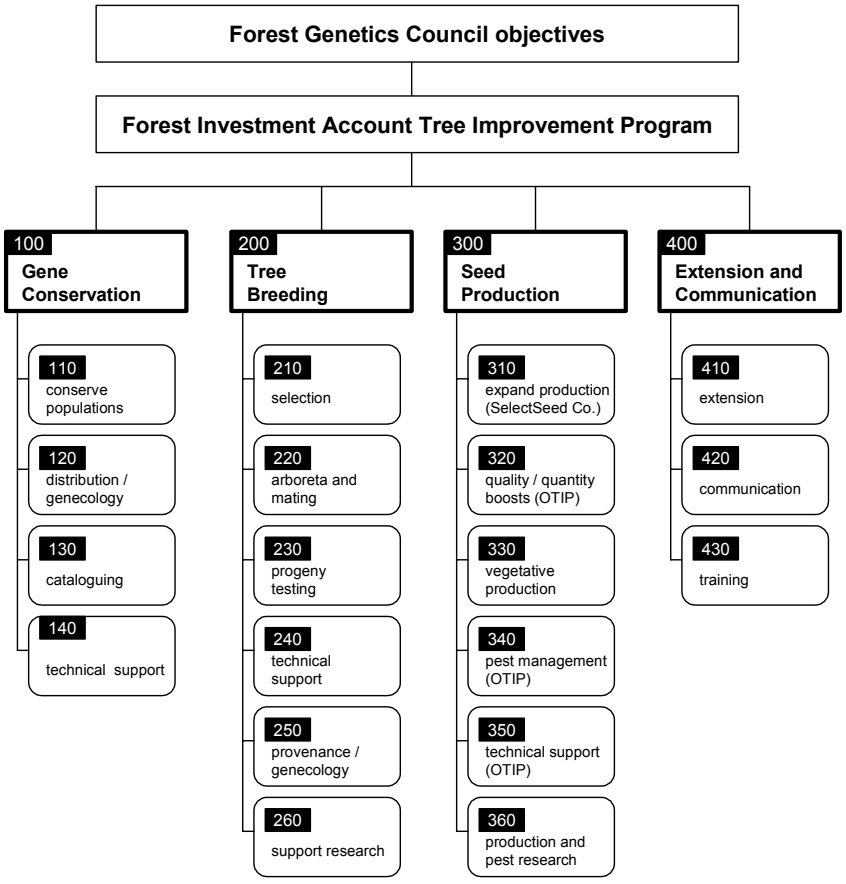
Figure 4 Administrative mechanisms for the delivery of the FIA Tree Improvement Program.



4.2 Monitoring and Reporting

An objective of the FGC is to monitor progress. 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 MOF Tree Improvement Program Administrator on or before October 15, 2005 and April 20, 2006.

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.

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.

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 8 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; MOF	FGC; TACs; FGC website	Nov 1
Annual report and progress summary	FGC Program Manager, Program Administrator MOF; project leader contributions	FGC; MOF 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: Summary of Budgets, Planning Processes, and Delivery Mechanisms

Subprogram	Budget ($ x 1000)	Delivery mechanism	Description	Subprogram development and reporting process
Gene Conservation	**$ 220**	MoF/UBC Contribution Agreement	• Conservation of genetic diversity • UBC Centre for Forest Gene Conservation	• Gene Conservation TAC reporting to FGC • Program technical strategy developed by Centre with TAC input
Tree Breeding	**$ 2,200**	TIB[5]/Research Br. MOU	• Testing, breeding and selection of high value stock from natural populations • Technical support to understand genetic diversity and mechanisms	• Strategies developed by MoF breeders and stakeholder committees • Technical Advisory Committee review • Reporting and monitoring using performance indicators
Operational Tree Improvement Program (OTIP)	**$ 600**	TIB Administration	• Support to boost orchard seed production and genetic quality • Technical support for orchard production and management	• Open call for proposals • Formal stakeholder review of proposals • Reporting and monitoring using performance indicators
Extension and Communication	**$ 120**	TIB Administration	• Communication to identified client groups • Extension to seed users to provide training and solutions • Education to inform and garner support	• FGC Extension TAC develops and reviews program • Activities managed by Coordinator from MoF TIB under TAC direction
Gene Resources Information Management	**$ 50**	TIB Administration	• Projects to improve user access to gene resource mgt. information and for seed use	• Subcommittee development of priorities with client • delivery by the MoF TIB and contractors
Orchard Pest Management	**$ 250**	TIB Administration	• Research and information support for seed orchard pest management	• Pest Management Subcommittee reporting to FGC develops technical strategy • Call for proposals; formal review of proposals • Support for MOF scientist focused on cone and seed pests
Administration	**$ 40**	TIB Administration	• Costs for financial mgt. and administration of all components of FIA TIP funding	• Government financial controls and administrative systems are applied
Sub-total	**$ 3,480**			
Expansion of Class A seed supply (SelectSeed Co. Ltd.)	**$ 890**	SelectSeed Multi-Year Agr.	• Expansion of seed orchard production capacity • FGC program management	• FGC sets objectives; TAC's develop strategy, need, and technical standards • Long-term orchard development projects are awarded through a request for proposals • Quarterly reporting on spending and performance indicators
Total	**$ 4,370**			

[5] TIB – MoF Tree Improvement Branch

Appendix 2: Seed Planning Units and Categories

The following table lists seed planning units and their activity category. All provincial SPUs were 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 2001–2005 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	500-1200	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	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 Planning Zone changes

Changes to the elevation ranges of some Seed Planning Zones (SPZ) and Seed Planning Units (SPU) were carried out to coincide with the release of the Chief Forester Standards for Seed Use. Changes were also made to re-align SPZ boundaries with the most recent BEC boundary information.

For more information, please contact Leslie McAuley of the Ministry of Forests Tree Improvement Branch <leslie.mcauley@gems9.gov.bc.ca>. Communiqués describing these SPZ/SPU changes are posted on the Tree Improvement Branch website at: www.for.gov.bc/tip.

Appendix 3: 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)	Ministry of Forests, Tree Imp. Br.	Ministry of Forests 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	Ministry of Forests, 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
Mark Hopkins	Ainsworth Forest Products	Southern interior industry
Walter Matosevic	Canadian Forest Products	Interior industry orchard owners
Diane Medves	Weyerhaeuser Canada	Coast industry
Al McDonald	BC Timber Sales	Ministry of Forests and BCTS
Mike Madill	Ministry of Forests, SI Region	Ministry of Forests
Dr. Alvin Yanchuk	Ministry of Forests, Research Br.	Ministry of Forests
Henry Benskin (non-voting rep)	Ministry of Forests	Forest Investment Account

Gene Conservation Technical Advisory Committee

Name	Affiliation	Name	Affiliation
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Dr. Sally Aitken	UBC	Alex Woods	Ministry of Forests
Dr. Scott Green	UNBC	Dr. Alvin Yanchuk	Ministry of Forests
Dr. Andreas Hamann	UBC		

Coastal Technical Advisory Committee

Name	Affiliation	Name	Affiliation
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Patti Brown	Canadian Forest Products	Dr. John Russell	Ministry of Forests
Charlie Cartwright	Ministry of Forests	Dr. Michael Stoehr	Ministry of Forests
Tim Crowder	TimberWest Forests	Annette van Niejenhuis	Western Forest Products
Diane Douglas	Ministry of Forests	Dr. Joe Webber	Ministry of Forests
Dr. John King	Ministry of Forests	Dr. Chang-yi Xie	Ministry of Forests
Dave Kolotelo	Ministry of Forests	Dr. Alvin Yanchuk	Ministry of Forests
Diane Medves	Weyerhaeuser		

Interior Technical Advisory Committee

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

Extension Technical Advisory Committee

Name	Affiliation	Name	Affiliation
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Dr. Michael Carlson	Ministry of Forests	Tia Heeley	Vernon Seed Orchard Co.
Charlie Cartwright	Ministry of Forests	Jill Peterson	Ministry of Forests
Keith Cox	Ministry of Forests	Doug Stables	Trust for Sustainable Forestry
Tim Crowder	TimberWest	Kathie Swift	FORREX
Diane Douglas	Ministry of Forests	Dave Trotter	Min. of Agric. Food and Fisheries
Peter Forsythe	Winton Global	Jack Woods	Forest Genetics Council
Lauchlan Glen	Glenviron Consulting		

Pest Management Technical Advisory Committee

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

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 (if any), seed orchard information and production forecasts, gain forecasts, historic seed use, seed in storage, gene conservation status, and genecology/seed transfer projects. The plans are presented in the pages that follow, organized by species.