



**Forest Genetics Council of BC
Business Plan 2003 – 2004**

(Abbreviated version)

**Compiled and edited by
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FGC Program Manager**

Message from the FGC Co-Chairs

We are pleased to present the 2003/04 Business Plan of the Forest Genetics Council of BC. This is the fourth annual comprehensive Business Plan prepared by Council and its committees, and it represents a very substantial co-operative effort by many people in government, industry, and universities throughout BC.

This Business Plan continues to put forward a balanced set of activities, including gene conservation, tree breeding, seed production, quality and quantity boosts, technical support, and extension. It also details activities for Forest Investment Account Tree Improvement Program spending. These funds continue to leverage other sources of support from industry, government and universities, and are critical for facilitating integrated planning and other key activities.

Orchard seed production and use continue to rise toward the objectives set by Council. With increasing use of select (A class) seed comes increasing revenues from seed sales. These revenues are supporting more and more of the orchard operations and infrastructure in BC; a trend that was anticipated by Council in its 1998 Strategic Plan, and one which is leading managers on orchard roguing, production, and management decisions.

This coming year will see the introduction in BC of the largest set of forest policy changes in several decades. The new policies will result in many different ways of doing business, and rapid changes. As the world shifts around BC tree improvement, so must we look to adjust our operations and means of co-operating. Council is currently embarking on a strategic planning process that will complete during the time of this Business Plan. The new Strategic Plan is likely to also result in some program changes that will not necessarily be easily or readily accepted by all affected. As we move forward in the new forest policy world, we must retain focus on the core principles of creating value, and seeking efficiency; in the absence of these, tree improvement will fast disappear in a sea of other priorities. We are, however, confident that Council, the Technical Advisory Committees and all co-operators will rise to these new challenges.

Genetically modified organisms continue to be a global issue. It is important to note that all materials used in British Columbia's operational reforestation programs are derived from selections of wild native trees exhibiting superior performance traits. There are no genetically modified trees used in BC provincial forests.

Finally, 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.

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FGC Co-chair
Riverside Forest Products Ltd.

Dr. Dale Draper
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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
April 4, 2003**

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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).

Section 2.0 outlines the process by which plans and budgets are developed for the FGC Business Plan.

Section 3.0 describes how the seven subprograms of the FGC Business Plan are planned and managed, and the major activities and budgets for each subprogram in 2003/04.

Section 4.0 identifies the agreements and administrative mechanisms by which the Forest Investment Account supports the FGC Business Plan.

Four appendices to the report include a summary of subprogram budgets, planning processes, and delivery mechanisms; a categorization of seed planning units (SPUs); Forest Genetics Council and committee members; and Species Plans for 49 SPUs in the province.

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 champion forest gene resource management in British Columbia, to oversee strategic and business planning for a co-operative provincial forest gene resource management program, 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 its 1998 Strategic Plan¹, Council's goal is:

To maximize the economic benefits from tree improvement investments for gains in wood quality, quantity and pest tolerance consistent with strategic land use planning by:

1. Managing a gene conservation program to maintain genetic diversity in commercial tree species.
2. Identifying and funding the long-term production capability required to meet approved Business Plan priorities.
3. Doubling the average volume gain of genetically improved seed² produced from 6% to 12% by 2007.
4. Increasing genetically improved seed use to 75% of total provincial sowing by 2007.
5. Monitoring progress in all aspects of gene resource management.

¹ The FGC Strategic Plan will be re-written during 2003.

² "Genetically improved" refers to seed that comes from tree breeding programs that select from wild stands the trees with superior characteristics for growth, strength, or pest-resistance. "Seed" as used here refers to all improved reforestation materials, including vegetative propagules. The Forest Genetics Council does not support genetic engineering, and no genetically modified materials are used in Crown land reforestation in British Columbia.

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. The Canadian Forest Service, MOF Research Branch, and universities undertake research supporting gene resource management, while private institutions focus on applied research related to operational production.

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 new mechanism for promoting sustainable forest management in British Columbia. FIA is founded on a Vote of the Legislature and includes three major objectives:

- Actively fostering sustainable forest management
- Improving the public forest asset base
- Promoting greater returns from the utilization of public timber.

FIA is delivered through three broad programs;

- **Land-Base Program** with investments by licensees through cooperative planning on management units within which they operate
- **Provincial Program** investments that require a greater degree of central planning and management, including tree improvement.
- **Forestry Innovation Program**, including research, forest product development and marketing.

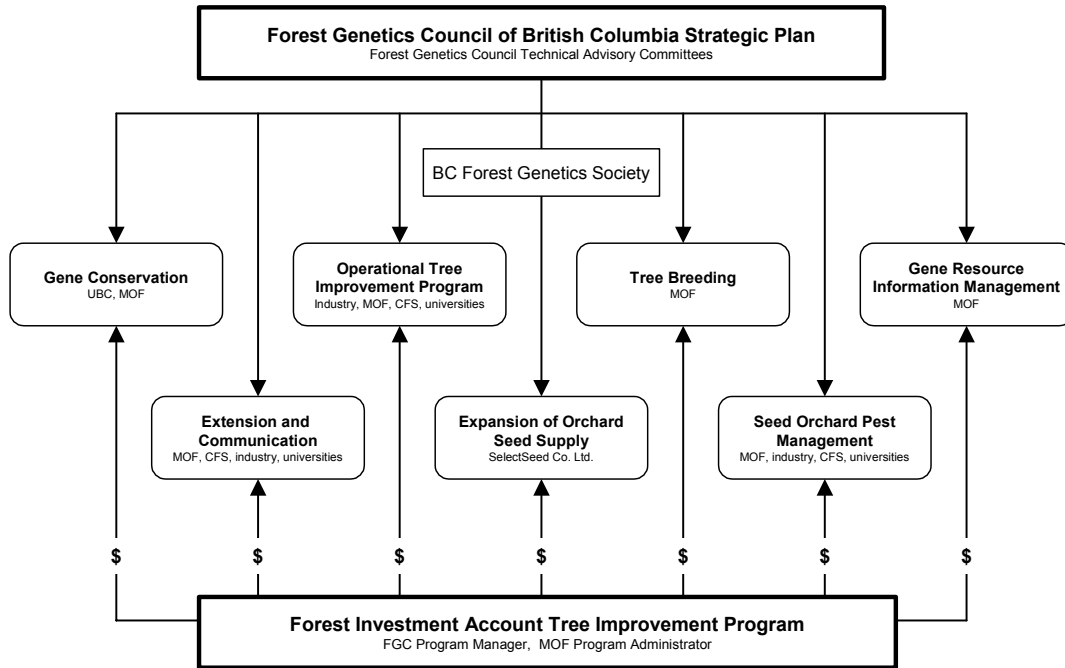
FIA investments are guided by the Forest Investment Council, and administered by the Ministry of Forests (MOF). The MOF has decision-making authority with respect to FIA expenditures, and, with assistance from other provincial government ministries, establishes objectives and delivery standards. However, government does not have a direct role in setting priorities, approving land-base program projects, verifying field work, or certifying project completion.

FIA tree improvement 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.

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 FGC Strategic Plan, Forest Investment Account TIP, and participants in the TIP subprograms.



2.0 Process for Business Plan Development

This section outlines the link between FGC objectives, planning processes, and the FGC Business Plan.

2.1 The Role of Council and its TACs

FGC members, representing the Ministry of Forests (MOF), forest companies, and universities, 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:

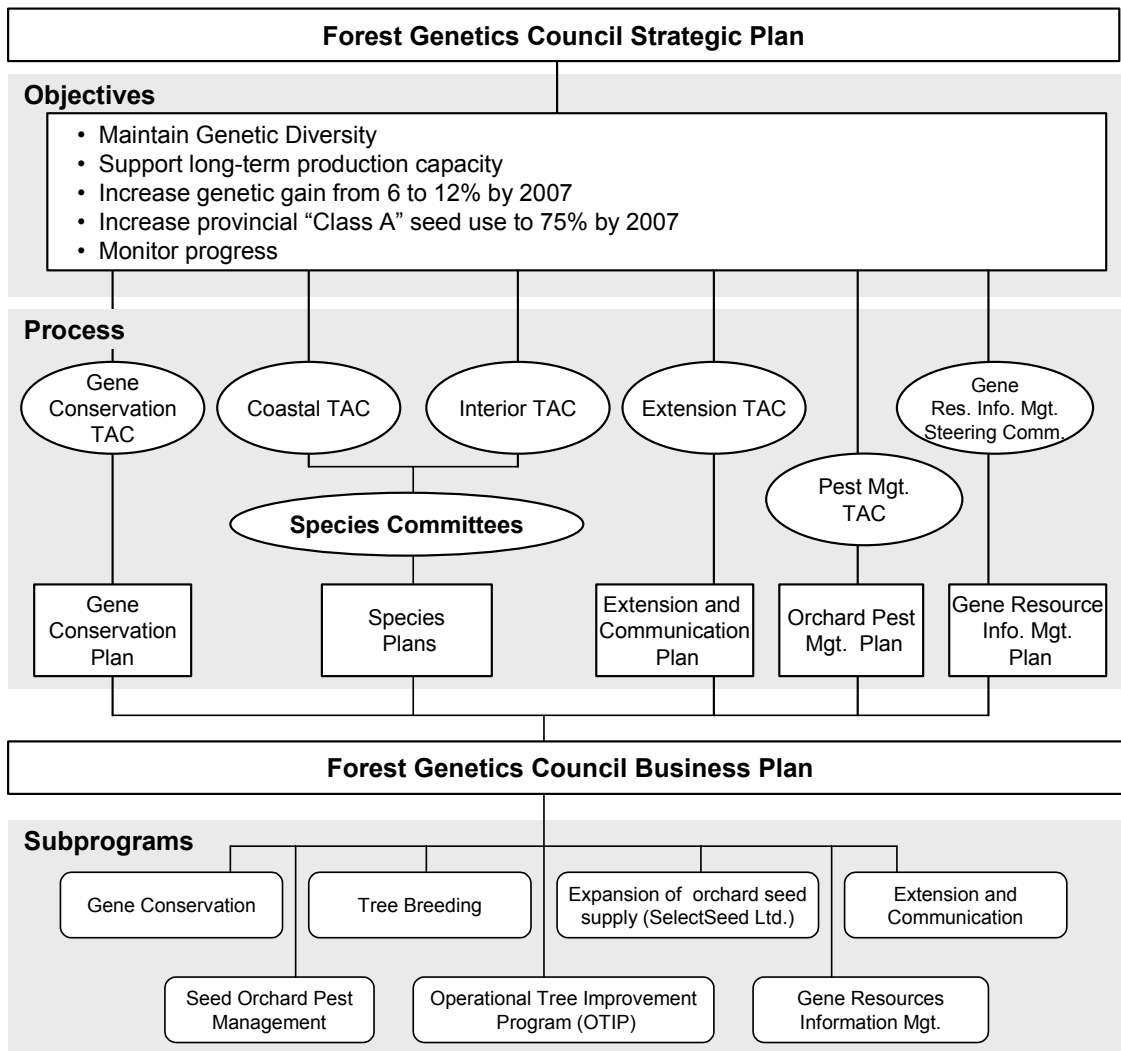
- The Gene Conservation TAC (GCTAC) advises Council on issues related to gene conservation and genetic diversity, and identifies required activities and budgets under the Gene Conservation Subprogram.
- The Coastal and Interior TACs, through their Species Committees, prepare Species Plans (Appendix 4)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

The MOF Tree Improvement Branch, with input from the FGC and FGC Program Manager, 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.

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



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.

3.0 Subprogram Planning and Management

This section describes how subprograms are planned and managed, and the major activities and budgets for each subprogram in 2003/04. Appendix 1 contains a summary of subprograms and budgets for the 2003/04 FGC Business Plan.

3.1 Gene Conservation Subprogram

Gene conservation is a fundamental element of the FGC Strategic Plan. Gene conservation activities protect 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 to identify specific *in situ* and *ex situ* conservation needs and strategies to address these needs, and will assist with forest certification issues as they relate to gene conservation. It will also allow the leveraging of funds with other national and international agencies.

In the 2003/04 fiscal year, the Centre will receive \$235,000 for staff, strategy development, and the continuation of several long-term projects to investigate and catalogue the genetic diversity of forest trees in B.C. Table 1 contains a Centre budget for 2003/04 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 other logistical support for specific projects.

Table 1 Centre for Forest Gene Conservation budgets for 2003/04, by project. Budgets include only activities funded by the Forest Investment Account.

Project	Budget (\$)	Products
Theoretical framework document(s)	5,000	1 report
Genetic issues in certification	5,000	1 report
Cataloguing and documenting <i>in situ</i> protection	37,000	53 SPUs / 12 maps
Sampling strategies and SPZs	15,000	1 final report
Markers and theory for measuring diversity	32,000	1 progress report
Whitebark pine diversity and conservation	30,000	1 progress report
Genetic structure of minor species	22,020	48 species dist. maps
Other expenses		
Research associate	63,800	
Extension	5,000	100 clients serves / web update
CFGC Expenses (office, computing)	8,990	
Subtotal	223,810	
5% UBC overhead	11,190	
Total approved 2003/04 budget	235,000	

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. The Subprogram also includes applied genecology work by MOF geneticists to support the information needs of seed planning unit³ (SPU) programs as described in Species Plans.

3.2.1 Planning

FGC Interior and Coastal TACs and their associated Species Committees assist with planning and strategy development for the Tree Breeding Subprogram. Through the development of species plans (Appendix 4), Committees estimate seed demand, orchard seed production, and program needs for each SPU. Breeding, genecology, and genetics research strategies developed by MOF tree breeders are reviewed, and direction is 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 is first developed for individual SPU by Species Committees. These budgets are then adjusted to meet the total expected Subprogram budget allocation by the Manager of Forest Genetics, MOF Research Branch, with input from MOF tree breeders, species committees, the FGC Program Manager and the Director of MOF Tree Improvement Branch. Final programs and budgets are reviewed and approved by the FGC.

³ Seed planning units – groupings by species, seed zone, and elevation band – form the basis for tree breeding and seed production planning.

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 2003/04 budget for the Tree Breeding Subprogram is \$2,291,000. Table 2 contains approved budgets and key performance indicators (KPI) for breeding activities by SPU. An additional \$83,000 worth of projects are risk-managed on the assumption that some planned work will not proceed due to unforeseen limitations.

3.3 Operational Tree Improvement Program (OTIP)

The OTIP supports FGC objectives to increase the quality and quantity of select seed⁴ produced from existing forest company and MOF seed orchards. It also provides technical support for orchard production and management.

3.3.1 Planning

OTIP spending is based on two sources of input:

- Species Plans developed by the Interior and Coastal TACs and their Species Committees provide direction for increasing production in existing facilities,
- a formal call for proposals is issued, based on the priorities set in the Species Plans, to increase the quality and quantity of seed and vegetative material for reforestation. Technical support projects that help solve production problems are also approved through this process.

FGC Review 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. The program is “risk-managed” by allocating more funding to projects than is available in the total OTIP budget. 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.

⁴ “Select” describes seed and vegetative material having a level of genetic gain greater than zero (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.



3.3.3 Activities and Budget

The 2003/04 OTIP budget is \$830,000; an additional \$31,500 will be risk-managed. Table 3 contains approved OTIP budgets and KPI for all SPUs.



Table 3 2003/04 budgets and KPI by seed planning unit for OTIP projects.
See Species Plans (Appendix 4) for more detail. Category numbers relate to Work Breakdown Structure (Figure 5).

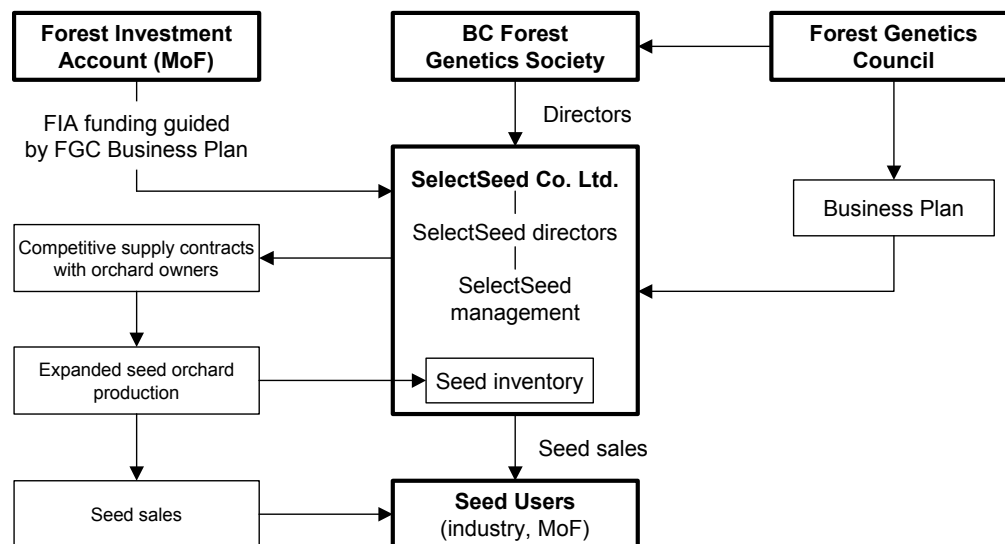
Seed Planning Unit				320 Quality / Quantity Boosts												330 Cuttings		340 Pest Management						350 Tech Sup.		Total \$ x 1000		
				321		322		323		324		325		326		327		331		341		342		343			# of projects	
#	Spp	SPZ	Elev (m)	# ramets grafted		# ramets in holding		# ramets replaced in orchards		# 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		
				KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$	KPI	\$			
1	Fdc	M	< 700	2500	18.5	500	0.7	9	0.2	965	10.8	2331	29.2	750	2.9	2429	10.9	0	0.0	5467	5.2	0	0.0	0	0.0	3	2.0	80.5
2	Cw	M	< 600	315	0.4	3269	2.3	900	1.7	1540	2.6	520	1.9	595	1.3	5465	9.4	0	0.0	4194	3.0	0	0.0	0	0.0	1	41.2	63.8
3	Hw	M	< 600	197	0.8	374	1.2	186	0.8	232	1.6	855	3.0	140	1.3	1005	3.4	0	0.0	1229	1.3	0	0.0	0	0.0	1	11.9	25.3
4	Sx	NE	1000-1500	113	0.8	481	2.1	300	2.2	0	0.0	495	3.8	0	0.0	983	8.1	0	0.0	3879	2.7	0	0.0	2424	20.7	3	46.9	87.4
5	Sx	NE	>1500	136	1.0	401	1.8	269	2.1	0	0.0	443	3.4	0	0.0	365	1.2	0	0.0	3116	2.5	0	0.0	1952	1.0	0	0.0	13.0
6	Ss	M	< 750	129	1.1	272	0.9	206	2.2	0	0.0	150	10.2	100	0.9	569	1.7	3500	5.4	841	1.1	0	0.0	0	0.0	0	0.0	23.4
7	Pli	NE	< 1400	44	0.2	158	0.7	86	0.8	0	0.0	2012	28.3	0	0.0	2231	9.6	0	0.0	3026	6.2	1187	0.9	3026	1.1	3	49.4	97.1
8	Pw	M/SM	< 1000	975	6.4	300	0.3	500	1.8	100	0.8	1100	12.7	0	0.0	750	2.9	0	0.0	1050	2.7	0	0.0	0	0.0	0	0.0	27.5
9	Ba	M	< 1000	0	0.0	0	0.0	0	0.0	0	0.0	150	0.8	0	0.0	1115	3.6	0	0.0	1115	0.5	0	0.0	0	0.0	1	5.4	10.4
10	Pli	TO	< 1400	0	0.0	0	0.0	117	1.3	0	0.0	2319	12.0	0	0.0	2319	2.4	0	0.0	2319	5.3	2319	1.9	2319	0.7	0	0.0	23.7
11	Yc	M	<1200	2000	1.6	2500	5.5	7600	9.8	0	0.0	0	0.0	0	0.0	17047	10.1	0	0.0	19800	1.4	0	0.0	0	0.0	4	34.7	63.1
12	Pli	PG	<1200	1806	19.0	0	0.0	0	0.0	0	0.0	2000	10.8	0	0.0	5140	7.7	0	0.0	5829	5.1	1440	1.8	0	0.0	9	5.1	49.3
13	Lw	NE	< 1300	869	5.2	49	0.2	116	1.2	59	0.8	691	5.9	0	0.0	352	0.8	0	0.0	1463	0.9	1463	0.0	0	0.6	2	4.4	20.0
14	Sx	PG	< 1200	1198	11.0	810	2.6	1929	13.9	0	0.0	0	0.0	0	0.0	13000	7.2	0	0.0	9345	5.7	3000	1.8	13000	2.5	1	12.2	57.0
15	Pw	KQ	<1400	50	0.3	141	0.7	12	0.1	16	0.5	1500	5.2	0	0.0	1025	2.9	0	0.0	2845	2.2	0	0.0	2280	1.8	0	0.0	13.7
16	Pli	TO	> 1400	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	646	1.7	0	0.0	646	4.3	646	1.0	0	0.0	0	0.0	7.0
17	Pli	BV	<1200	439	1.5	439	1.5	439	1.5	0	0.0	5000	26.0	300	4.4	1600	2.8	0	0.0	7450	6.0	1600	1.5	0	0.0	1	9.9	55.2
18	Pli	CP	<900 *	332	1.2	332	1.2	332	1.2	0	0.0	3000	12.5	200	2.2	1000	2.3	0	0.0	5300	4.2	1000	1.3	0	0.0	0	0.0	26.1
19	Fdc	SM	200-1000	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
20	Pli	NE	> 1400	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
21	Fdi	NE	< 1000	0	0.0	0	0.0	0	0.0	0	0.0	1755	3.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3.9
22	Fdi	NE	> 1000	120	1.3	25	0.1	19	0.2	0	0.0	1	0.7	0	0.0	368	0.8	0	0.0	1473	0.4	0	0.0	1489	0.6	0	0.0	4.2
23	Sx/Ss	SM/NST	all	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
24	Hw	M	> 600	313	2.4	76	0.6	240	1.9	173	1.7	223	4.8	0	0.0	157	0.9	0	0.0	400	0.6	0	0.0	0	0.0	0	0.0	13.0
25	Sx	EK	< 1700	0	0.0	49	0.2	27	0.3	26	0.4	1719	6.7	0	0.0	487	1.1	0	0.0	1949	3.0	0	0.0	1976	0.8	0	0.0	12.6
26	Pli	PG	> 1200	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
27	Cw	SM	200-1000	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
28	Sx	TO	1300-1850	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	500	4.4	1054	7.1	0	0.0	1054	4.1	0	0.0	0	0.0	0	0.0	15.6
29	Pli	EK	> 1500	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
30	Sx	TO	< 1300	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
31	Fdc	M	> 700	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
32	Pli	EK	< 1500	200	3.5	135	0.6	0	0.0	0	0.0	0	0.0	0	0.0	422	0.9	0	0.0	1688	0.9	0	0.0	1688	0.7	0	0.0	6.6
33	Cw	M	> 600	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
34	Lw	EK	800-1500	470	3.1	53	0.2	58	0.6	119	1.6	0	0.0	0	0.0	438	1.0	0	0.0	1690	1.2	0	0.0	1751	0.7	1	6.5	14.9
35	Sx	BV	< 1200	61	0.4	268	1.2	0	0.0	0	0.0	583	1.9	0	0.0	146	0.4	0	0.0	583	0.9	0	0.0	583	0.2	1	13.4	18.3
36	Bg	M	< 700	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
37	Fdi	QL	< 1200	0	0.0	0	0.0	0	0.0	0	0.0	300	7.0	0	0.0	0	0.0	0	0.0	351	1.6	0	0.0	0	0.0	0	0.0	8.5
39	Fdi	EK	all	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
40	Sx	PR	650-1200	0	0.0	0	0.0	0	0.0	349	1.1	0	0.0	0	0.0	349	1.1	0	0.0	2101	1.6	0	0.0	2101	0.4	0	0.0	4.1
41	Fdi	PG	< 1000	0	0.0	0	0.0	0	0.0	0	0.0	200	3.2	0	0.0	0	0.0	0	0.0	540	1.5	540	0.9	0	0.0	0	0.0	5.5
42	Sx	PG	> 1200	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
43	Fdi	CT	< 1100	0	0.0	0	0.0	0	0.0	0	0.0	600	8.5	0	0.0	0	0.0	0	0.0	1050	1.6	1050	0.8	0	0.0	0	0.0	10.8
Totals				12267	80	10632	25	13345	44	3579	22	27947	202	2585	17	60462	102	3500	5.4	91793	77.7	14245	11.9	34589	32.0	31	243.0	861.5
Risk-managed amount																										31.5		
Total FIA supported budget																										830.0		

3.4 Expansion of Orchard Seed Supply Subprogram

Seedling demand and orchard capacity needs for each seed planning unit are estimated by Species Committees. For SPUs with insufficient existing 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, and under the control of the FGC (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 its 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,⁵ and is limited by the terms of the SelectSeed Multi-Year Agreement with the MOF. Investments in new

⁵ The Board is comprised of representatives from the private sector, including one FGC Co-Chair.

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 reviewed by the Forest Genetics Council on March 5, 2003, and approved by a formal resolution of the Council on April 4, 2003.

3.4.3 Activities and Budget

In 2003/04, 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 9,000 ramets are expected to be planted in orchards during the fiscal year. Propagation and holding for orchard expansion will continue, with approximately 8,300 grafts to be completed, and an additional 7,800 ramets to be held for orchard development. Ramets currently planted in the 14 seed orchards, combined with new planting during 2003/04, will result in approximately 33,000 ramets under management. Total completed size for SelectSeed contract orchards will be 35,300 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, and general program administration.

Spending for 2003/04 is projected to be \$1.29 million, down from \$1.9 million in 2002/03. This reduction reflects the high cost of initial orchard capital development, followed by reducing management costs. 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 Orchards under contract to SelectSeed Company Ltd. as part of the Orchard Expansion Subprogram.

<i>Seed planning unit</i>					
#	Species	Seed zone	Planned # ramets	# ramets currently established	Location
21	Fdi	NE low	2187	1733	Armstrong
37	Fdi	QL	975	871	Vernon
41	Fdi	PG	786	692	Vernon
28	Sx	TO high	1052	976	Armstrong
30	Sx	TO low	454	377	Armstrong
7	Pli	NE low	1000	944	Armstrong
10	Pli	TO low	4800	3800	Armstrong
12	Pli	PG low	4871	2721	Kettle Valley
12	Pli	PG low	4500	3504	Vernon
16	Pli	TO high	3475	2759	Armstrong
17	Pli	BV low	3000	2690	Vernon
17	Pli	BV low	3100	0	Sorrento
18	Pli	CP low	2000	0	Sorrento
18	Pli	CP low	3100	2337	Kettle Valley
TOTALS			35,300	23,404	

3.5 Extension and Communication Subprogram

The Extension and Communication Subprogram supports FGC goals and objectives through three types of activities:

- 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 related to 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 2003/04 is \$45,000. 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 2003/04

Project	Budget (\$)
Presentation template: Incorporating tree improvement benefits in timber supply planning	7 000
Extension note: <i>Balancing seed cost/supply with nursery seed needs</i>	2 000
Workshop: Tree Improvement Workshop for the Vancouver Region	1 000
Extension note(s): on various tree improvement topics	5 000
Workshops: Local Tree Improvement workshops for Northern Forest Region - tailgate sessions with woodlands managers	1 000
Extension note: Template for periodic updates on orchard and seed zone activities relating to individual species	1 000
Total FIA Tree Improvement Program Contribution	45 000

3.6 Gene Resource Information Management Subprogram

The Gene Resource Information Management Subprogram (GRIM) undertakes the development of forest tree gene resource information management projects that support operational gene resource planning, best practices and conservation. Projects supported include the development of new gene resource spatial and attribute data, as well as computer-based information systems that are cost effective, easy-to-use and incorporate new e-commerce, server, and web-based technologies.

3.6.1 Planning

GRIM activities and budgets are developed by the Gene Resource Information Management Steering Committee. The Steering Committee is comprised of MOF Tree Improvement and Research Branch staff, a MOF Information Management Group business analyst, industry representatives, a representative from the Centre for Forest Gene Conservation, and the FGC Program Manager. Projects are identified by the steering committee, developed by Tree Improvement Branch, and presented to the FGC for approval. Approved projects are identified in the FGC Business Plan.

3.6.2 Management

The GRIM Subprogram is managed by the Ministry of Forests Tree Improvement Branch, 'headquarters' gene resource management section. Significant project changes or re-allocations of funds from the approved Business Plan require approval of the FGC Program Manager and, when needed, the FGC.

3.6.3 Activities and Budget

The GRIM subprogram will continue to focus on the development of an effective provincial gene resource management framework for delivery of well-adapted, high-gain genetic material at the operational level. Information systems development projects that are in progress include SPAR⁶

⁶ SPAR is the Seed Planning and Registry System; a computer-based system used for the registration, inventory management, testing, ordering and tracking of all seed used in Crown land reforestation.

Web Conversion, and SeedMap, a web-based seed planning and mapping system. Continued development of SPAR and SeedMap will focus on additional report options, Results Based Code related needs, and on implementation of government-wide e-commerce initiatives (e-forms). Incorporation of the Parent Tree Registry into SPAR and SeedMap will also be initiated in the 2003/2004 fiscal year.

Further development of a land-based Gene Resource Management (GRM) planning framework will be undertaken in the 2003/04 fiscal year. The primary objective of the GRM component of the subprogram will be to assist field operators in considering gene resource concerns in land use planning, forest stewardship management plans and with incorporation of high-gain genetic material in timber supply analyses. GRM projects this fiscal year will include development of a gene resource management framework (based on a new provincial seed planning model - merging of orchard and natural stand seed planning zones) and development of effectiveness monitoring tools with respect to seed deployment and gene conservation. This work will build on in-situ genetic resource protection catalogue work currently being done by the UBC Centre for Forest Gene Conservation. Further work will also be undertaken in the area of extension and training to ensure clients are familiar with the web-based information management systems being developed, and are able to use these tools effectively.

Funding for this project is shared between FIA and the Ministry of Forests. Total funding allocated from the FIA Tree Improvement Program will be \$80,000 during fiscal year 2003/04.

3.7 Pest Management Subprogram

The Pest Management Subprogram is new for 2003/04. This subprogram supports FGC objectives by reducing orchard seed losses to insect and disease pests through technical support, and the development of integrated pest management strategies in conjunction with orchard managers.

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.

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.

Approved projects are applied research in nature, and are incremental to specific orchard management actions supported through OTIP or carried out independently by orchard managers.

3.7.2 Management

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.

3.7.3 Activities and budget

The total Pest Management subprogram budget for 2003/04 is \$79,000. 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. Approved Pest Management Subprogram projects for 2003/04

Project	Species primarily impacted	Budget (\$)
Conifer seed bug (<i>Leptoglossus occidentalis</i>): Identification of male-produced communication signals	Pli, Fdi, Fdc, Pw	34,900
Fir coneworm (<i>Dioroctia abietivorella</i>): Identification of an effective sex pheromone lure and the demonstration of its efficacy in seed orchards	Fdi, Fdc	27,000
Seed chalcids (<i>Megastigmus spp.</i>): Identification of seed chalcids infesting seed of BC conifers; distribution and natural enemies	Fdi, Fdc, all spruces, Pw, Hw, Lw	7,100
Operational assay program for three primary fungal species impacting conifer seed in BC	All species	10,000
Total FIA Tree Improvement Program Contribution		79,000

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 all aspects of 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 2003/04 budget for the Administration Subprogram is \$225,000. This amount includes all program administration costs. These funds will also help support MOF salary costs for orchard pest management staff.

3.9 Subprogram Budget Summary

The total budget for the Forest Investment Account Tree Improvement Program is \$5.075 million (Table 7).

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

Subprogram	Budget (\$)
Gene Conservation	235,000
Tree Breeding	2,291,000
Operational Tree Improvement Program (OTIP)	830,000
Extension and Communication	45,000
Gene Resource Information Management	80,000
Seed Orchard Pest Management	79,000
Administration	225,000
Subtotal	3,785,000
Expansion of Orchard Seed Supply (SelectSeed Ltd.)	1,290,000
Total FIA Tree Improvement Program Contributions	5,075,000

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.

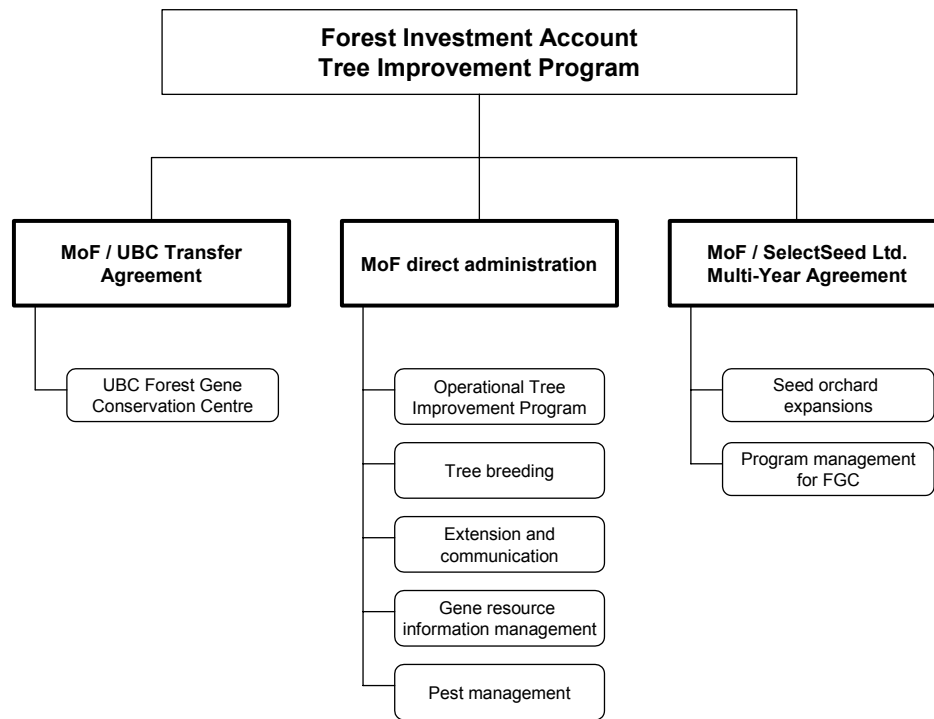
4.1 Funding Agreements

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 Transfer 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.

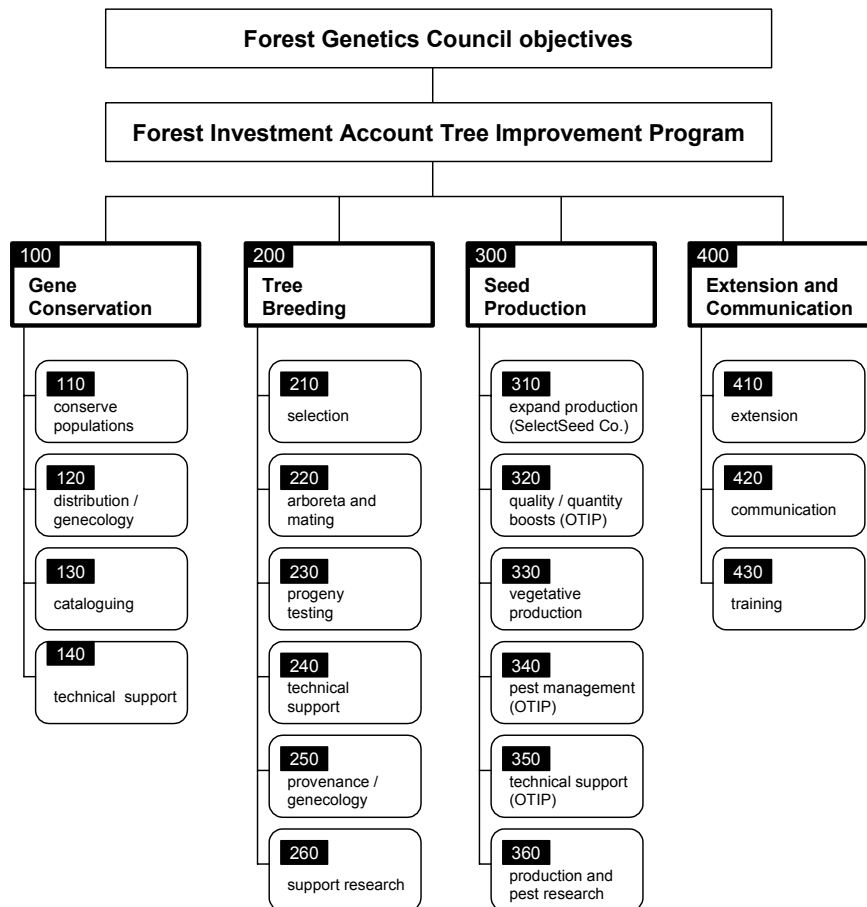
Figure 4 Administrative mechanisms for the delivery of the FIA Tree Improvement Program.



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 FGC Program Manager on October 15, 2003 and April 20, 2004.

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). The indicators simplify reporting for project proponents, and make it possible to summarize progress at the

project, seed planning unit, and provincial levels. Progress towards FGC objectives 3 and 4 (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 3 and 4 (increasing genetic gain, increasing use of orchard seed) 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

Delivery mechanism	Subprogram	Budget (\$ x 1000)	Description	Subprogram development and reporting process
MOF/UBC Contribution Agreement	Gene conservation	\$235	<ul style="list-style-type: none"> Monitoring gene conservation status UBC Centre for Forest Gene Conservation 	<ul style="list-style-type: none"> Gene Conservation TAC reports to FGC Program technical strategy developed by Centre with TAC input
TIB ⁷ /Research Br. MOU	Tree breeding	\$2,291	<ul style="list-style-type: none"> Testing, breeding and selection of high value genetic material from natural populations Technical support to understand genetic diversity and mechanisms 	<ul style="list-style-type: none"> FGC objectives Strategies developed by MOF breeders and stakeholder committees Technical Advisory Committee review Reporting and monitoring using key performance indicators
TIB Administration	Operational Tree Improvement Program (OTIP)	\$830	<ul style="list-style-type: none"> Support to boost orchard seed production and genetic quality Technical support for orchard production and management 	<ul style="list-style-type: none"> FGC objectives Open call for proposals Formal stakeholder review of proposals Reporting and monitoring using key performance indicators
TIB Administration	Extension and Communication	\$45	<ul style="list-style-type: none"> Communication to identified client groups Extension to seed users to provide training and solutions Education to inform and garner support 	<ul style="list-style-type: none"> FGC Extension TAC develops and reviews program Activities managed by Coordinator from MOF TIB under TAC direction
TIB Administration	Gene Resources Information Management	\$80	<ul style="list-style-type: none"> Projects to improve user access to gene resource mgt. Information, and for seed use 	<ul style="list-style-type: none"> Subcommittee development of priorities Client input Delivery by the MOF TIB and contractors
TIB Administration	Orchard pest management	\$79	<ul style="list-style-type: none"> Research and information support in seed orchard pest management 	<ul style="list-style-type: none"> Pest Management Subcommittee reporting to FGC develops technical strategy Subprogram management by MOF pest mgt. specialists
TIB Administration	Administration	\$225	<ul style="list-style-type: none"> Costs for financial mgt. and administration of all components of FIA TIP funding 	<ul style="list-style-type: none"> Government financial controls and administrative systems are applied
	Sub-total	\$3,785		
SelectSeed Multi-Year Agreement	Expansion of Class A seed supply (SelectSeed Co. Ltd.)	\$1,290	<ul style="list-style-type: none"> Expansion of seed orchard production capacity FGC program management 	<ul style="list-style-type: none"> FGC sets objectives; TAC's develop strategy, need, and technical standards Long-term orchard development and management projects awarded through RFP procedures Quarterly reporting on spending and performance indicators
	Total	\$5,075		

⁷ 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 mean of 1999–2003 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;

- Advanced-generation program,
- First-generation program,
- Genecology, and
- no genetics program.

#	Seed planning unit (SPU)			Annual planting (millions)	Program category	Value rank
	Species	SPZ	Elev. band (m)			
9	Ba	M	<1000	1.7	3	41
36	Bg	M	<700	0.1	3	45
46	Bl	NST/all int.	all	1.3	3	46
47	Bn	M	>600	0.1	3	47
2	Cw	M	<600	6.8	1	4
33	Cw	M	>600	1.0	2	27
27	Cw	SM	200-1000	0.7	3	42
1	Fdc	M	<700	9.1	1	1
19	Fdc	SM	200-1000	1.1	2	29
31	Fdc	M	>700	0.9	2	31
21	Fdi	NE	<1000	2.4	1	18
41	Fdi	PG	<1000	2.0	2	32
39	Fdi	EK	all	0.7	2	33
37	Fdi	QL	<1200	0.9	2	34
22	Fdi	NE	>1000	2.5	2	35
43	Fdi	CT	<1100	0.5	2	37
38	Hw	M north	<600	Part of SPU 3 Hw M low		
3	Hw	M	<600	1.9	1	10
24	Hw	M	>600	1.0	2	23
13	Lw	NE	<1300	2.8	1	14
34	Lw	EK	800-1500	1.5	1	21
12	Pli	PG	<1200	24.0	1	2
7	Pli	NE	<1400	4.3	1	5



#	Seed planning unit (SPU)			Annual planting (millions)	Program category	Value rank
	Species	SPZ	Elev. band (m)			
18	Pli	CP	<900 N of 56° <1100 S of 56°	10.5	1	8
17	Pli	BV	<1200	14.9	1	9
10	Pli	TO	<1400	10.1	1	12
16	Pli	TO	>1400	6.5	2	25
32	Pli	EK	<1500	2.1	2	30
20	Pli	NE	>1400	3.0	3	38
29	Pli	EK	>1500	1.7	3	39
26	Pli	PG	>1200	3.6	3	40
45	Pli	BB/CHL	all	10.8	3	43
8	Pw	M/SM	<1000	0.4	1	13
15	Pw	KQ	<1400	1.0	1	16
6	Ss	M	<750	1.0	1	3
5	Sx	NE	>1500	5.4	1	7
14	Sx	PG	<1200	25.9	1	6
4	Sx	NE	1000-1500	4.4	1	11
35	Sx	BV	<1200	8.0	1	15
28	Sx	TO	1300-1850	3.4	1	19
25	Sx	EK	<1700	1.3	1	20
40	Sx	PR	650-1200	8.0	2	22
42	Sx	PG	>1200	2.4	2	26
44	Sx	NE	<1000	0.9	2	28
30	Sx	TO	<1300	1.3	2	36
23	Sx/Ss	SM/NST	all	0.8	3	44
11	Yc	M	<1200	1.2	1	17
48	Aspen/birch/poplar	Interior	-	NA	3	48
49	Alder/poplar/maple	Coast	-	NA	3	49