



BUSINESS PLAN AND 2016-2017 ANNUAL WORK PLAN

Forest Growth Organization of Western Canada

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Prepared by:
Sharon Meredith, MScF, RPF

TABLE OF CONTENTS

List of tables	ii
List of Figures	ii
Background	1
Vision and Mission	1
Project Priorities	2
Management and Decision Making	3
Plenary Committee	3
Executive Council	3
Management Team.....	3
Financial Management	5
Project Teams and Committees.....	5
Collaboration and Partnerships	5
Communications Plan	6
Administration and Management.....	6
Program.....	7
EPH Project Team.....	8
Foothills Pine Project Team	9
Regenerated Lodgepole Pine	9
Cooperative Management of Historical Research Trials.....	12
Stand Dynamics After MPB Attack.....	13
Establishment of PSP Network to Monitor Stand Dynamics and Establish Yield Curves for Stands Killed by MPB	14
Foothills Pine Project Team Financial Summary	16
Mixedwood Project Team.....	16
Dynamic Aspen Density Experiment	17
Strip Cut Understory Protection Trial	19
Silviculture Guide	21
Mixedwood Project Team Financial Summary	21
Policy and Practice Project Team.....	22
Provincial Growth and Yield Initiative.....	22
Cutblock Inventory Classification Subcommittee	24
Growth and Yield Model Support	24
Communications with the AFPA	25
Policy and Practice Project Team Financial Summary	26
Tree Improvement Alberta	26
WESBOGY Project Team.....	28
FRIAA Open Funds and Other Externally Funded Projects	30
2016-2017 Work Plan	34
Appendix 1: Growth and Yield Gap analysis and Research Priorities	39
Appendix 2. Membership and Project Team dues by organization for 2016-2017.....	51
Appendix 3. Member Contact Information and Project Team Affiliation	52
Appendix 4. Summary of deliverables and progress for the Regenerated Lodgepole Pine Trial.	58
Appendix 5. Foothills Pine Project Team Work and Cost Allocation Based on Pine-leading Area	60

LIST OF TABLES

Table 1. FGrOW administration expense summary.	7
Table 2. FGrOW administrative funds income summary.	7
Table 3. <i>Regenerated Lodgepole Pine</i> project –Scheduled measurement by type and FMA, and estimated measurement costs.	11
Table 4. <i>Regenerated Lodgepole Pine</i> project expense summary.	11
Table 5. Cost schedule for FGYA contribution to <i>Cooperative Management of Historic Research Trials</i> project.	12
Table 6. Project Team costs for <i>Cooperative Management of Historic Research Trials</i> project.	13
Table 7. Expense summary for <i>Stand Dynamics after MPB Attack</i>	14
Table 8. <i>Foothills Pine Project Team</i> financial summary.	16
Table 9. Summary of <i>DADE</i> establishment locations and timing.	18
Table 10. <i>DADE</i> expense summary.	19
Table 11. Summary of <i>SCUP</i> establishment locations and timings.	20
Table 12. <i>SCUP</i> expense summary.	21
Table 13. <i>Mixedwood Project Team</i> financial summary.	21
Table 14. <i>PGYI</i> expense summary.	23
Table 15. <i>CICS</i> expense summary.	24
Table 16. <i>Growth and Yield Model Support</i> project expense summary.	25
Table 17. <i>Policy and Practice Project Team</i> financial summary.	26
Table 18. Draft WESBOGY Project Team budget estimates for January 2015 –March 2016.	30
Table 19. 2015-2016 deliverables and deadlines.	34
Table 20. 2015-2016 financial summary for all FGrOW Project Teams.	38

LIST OF FIGURES

Figure 1. FGrOW Organizational Structure.	4
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BACKGROUND

The Forest Growth Organization of Western Canada (FGrOW) began operating in April 2015 as an amalgamation of four growth and yield associations: Alberta Forest Growth Organization (AFGO), Foothills Growth and Yield Association (FGYA), Mixedwood Management Association (MWMA) and Western Boreal Growth and Yield Association (WESBOGY), which joined January 1, 2016. The intent of the amalgamation was to increase efficiencies and to attract more funding to growth and yield in Western Canada. As of April 1, 2016, Tree Improvement Alberta (TIA) became a project team under FGrOW.

Members of the four founding associations place a high value on continuation of existing projects and research, but also recognize the advantages of coordinating efforts to increase opportunities for funding and to raise the profile of growth and yield in western Canada.

FGrOW is an association under fRI Research (formerly the Foothills Research Institute) which acts as coordinating agency, providing accounting and administrative support.

This document contains both the FGrOW business plan for the period from April 1, 2016 to March 31, 2021 and a detailed work plan for the 2016-2017 business year.

VISION AND MISSION

Members of FGrOW have collaboratively defined the organization's Vision, Mission and Goals. This process was intended to create a standard against which FGrOW can measure its success, provide guidance in initiating new activities and help establish an identity for FGrOW. The Vision and Mission of FGrOW are as follows.

Vision: FGrOW is the leader in cooperative growth and yield research, model development and data management in western Canada. FGrOW drives the advancement of the science of forest growth and provides information to support policy development and changes in forestry practices.

Mission: FGrOW serves its members by providing access to better forest growth data and knowledge, and to tools that support forest management decision-making. FGrOW facilitates collaboration, seeks partnerships, identifies efficiencies for its members, and pursues alternative funding sources to advance member-defined priorities.

Success in achieving its mission will be measured by the following:

1. **Defensible data:** Quality data collected to agreed-upon standards maximizes its potential utility.
 - **Target:** PSP measurements are submitted to the PGYI database for all FMAs in Alberta.
2. **Application of results:** Research is completed, models and tools are developed, and knowledge is transferred to members.

- **Target:** A minimum of 5 tech-transfer products, such as QuickNotes or workshops, are produced annually.
- 3. **Reduced costs:** Association activities and strategic collaborations will lead to efficient use of member investments.
 - **Target:** 75% of members report that FGrOW's work has led to cost savings.
- 4. **Enabling informed decision making:** Scientifically defensible results support choices made by practitioners and support policy development.
 - **Target:** Two papers published in peer-reviewed journals annually.
- 5. **Training:** Members gain knowledge through participation; training of new practitioners to develop skills needed to contribute to future research.
 - **Target:** 100% of member organizations have staff attending at least one training session annually.
- 6. **Membership:** Value of FGrOW is recognized by its members and within the growth and yield community.
 - **Target:** FGrOW membership is stable or growing.

PROJECT PRIORITIES

In its inaugural year, FGrOW's main focus was on the continuation of its existing projects. These included the work of the four founding associations, and three additional projects at the University of Alberta which were jointly identified at workshops in August 2013 and 2014 by members of the four associations and are supported by FRIAA open funds.

FGrOW expanded its mandate with two new projects and a new project team in 2015-16. The first project, funded by the FRIAA Mountain Pine Beetle Rehabilitation Program, is establishing a network of PSPs in stands attacked by Mountain Pine Beetle. The project is managed by the Foothills Pine Project Team. FGrOW was successful in obtaining project funding through FRIAA Open Funds for a new project, *Empirical Post-Harvest Stand Growth Assessment: Stand Structure Development and Growth*. The EPH Project Team was struck to deliver this project. As of April 1, 2016, Tree Improvement Alberta began operating as a Project Team of FGrOW

FGrOW maintains a list of research priorities (Appendix 1) that is updated annually based on member feedback and used to select high priority projects when funding becomes available. Along with research priorities, FGrOW will pursue recommendations in AFGO's *Vision for Growth and Yield in Alberta* document, which was developed based on a workshop in April 2014. The two biggest challenges for growth and yield in Alberta, which also apply to the rest of Western Canada, were identified to be shortages of competent field and analytical staff, and availability of funding. FGrOW will look at avenues to address these challenges including researching new technology, training, coordination of data collection, and collaboration with the University of Alberta.

An increasingly important focus for FGrOW is ensuring that the results of its research are implemented by practitioners. FGrOW continually seeks opportunities for tech transfer and to communicate with its members and other interested parties about its research.

MANAGEMENT AND DECISION MAKING

PLENARY COMMITTEE

Decision making will be carried out by the membership as a whole through the Plenary Committee, which approves a business and work plan at each annual general meeting. The Plenary Committee is composed of one representative from each voting member. New projects or initiatives introduced in advance of completed work plans will be included in the work plan and will require approval by members. Where projects or initiatives are identified following approval of the work plan they will be tabled with the Plenary Committee for vote. As described below, the membership delegates certain authorities to the Executive Council and Management Team (Figure 1).

EXECUTIVE COUNCIL

The Executive Council will manage the ongoing affairs of FGrOW as directed by the membership. One of the primary functions of the Executive Council is to oversee the Management Team. The Executive Council may coordinate broader discussions among the membership and others about the science of growth and yield in western Canada. The Executive Council may initiate ad-hoc committees as necessary.

The Executive Council Chair is also chair of the Plenary Committee. The Chair leads Executive Council meetings and records its decisions and key activities.

MANAGEMENT TEAM

The Management Team will consist of a Director and an Administrative Assistant who manage the day-to-day affairs of the organization. As the coordinating agency, fRI Research will provide accounting and administrative support. The team will operate under the direction of the Executive Council and strictly within the conditions laid out in the FGrOW MOU. The roles of the Director and Administrative Assistant are as follows:

Director:

- Complete annual reports, business plans and work plans
- Communications with members and stakeholders
- Represent the organization and act as an initial point of contact for external requests
- Have a high level knowledge of the timing and logistics of all projects
- Sit on the Executive Council and act as secretary

- Make decisions in delivering the projects, initiatives and any other activity identified in the business plan
- Provide support to projects as requested by Project Teams

Administrative Assistant:

- Maintain website and SharePoint site on an ongoing basis
- Support the Director in preparing annual reports, business plans and work plans
- Maintain the records of the organization
- Organize meeting and tours
- Take minutes at AGMs and plenary meetings
- Provide support to projects as requested by Project Teams

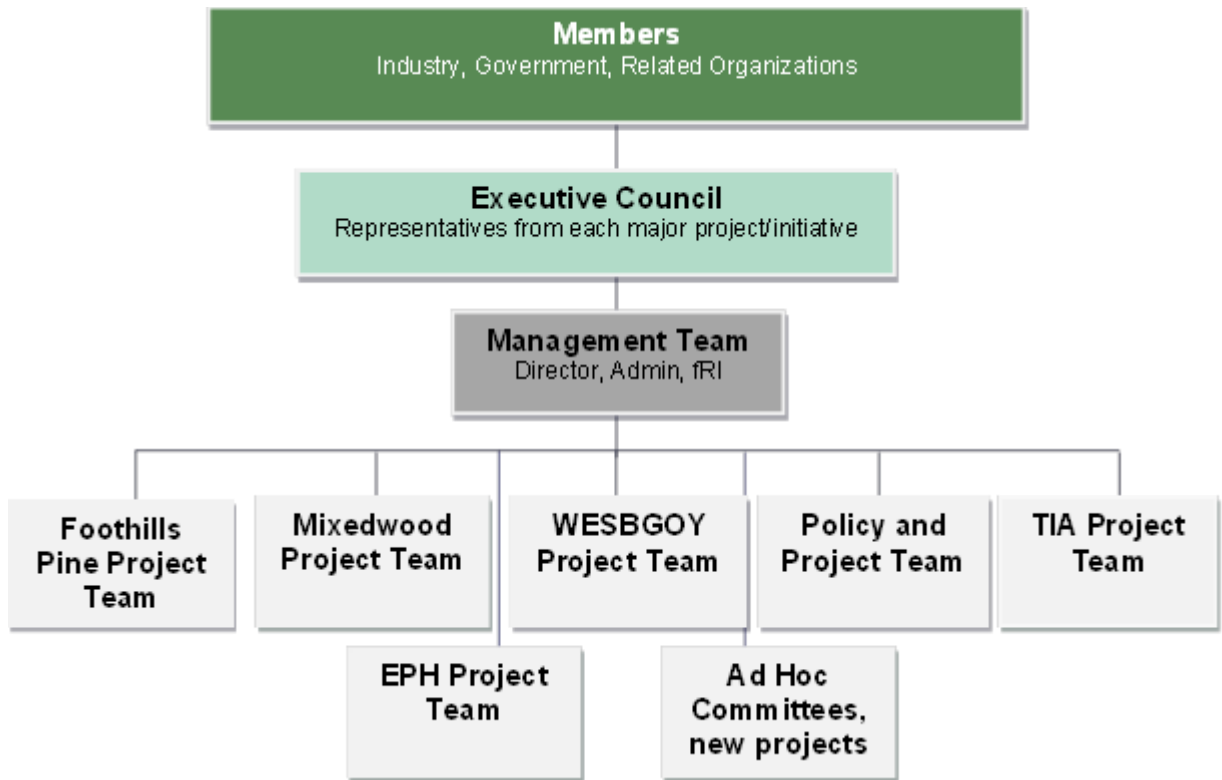


Figure 1. FGrOW Organizational Structure.

FINANCIAL MANAGEMENT

The management of finances is primarily carried out by the Management Team, with the Director carrying ultimate responsibility for managing revenues and expenses, and reporting variances to the Executive Council. Projects are expected to have a project plan and budget, either included or referred to, in the business plan that is approved by members and implemented by the Management Team. In the case of projects or programs managed at the University of Alberta, finances other than dues can either be provided directly to the University or channelled through FGrOW to the project. New accounts will be established at fRI Research for each project or initiative to manage its revenues (grants, contributions etc.).

PROJECT TEAMS AND COMMITTEES

Project Teams and committees will be established to carry out specific tasks or to oversee specific projects and initiatives. The following teams/committees will be required:

- **Project Teams:** Ongoing Project Teams will be established to manage one or multiple projects of a similar nature that involve the delivery of work being funded or overseen by industry members. Initially, the Project Teams were the programs of the four founding associations (i.e. AFGO, FGya, MWMA, and WESBOGY). Two new project teams have been added: the EPH Project Team and Tree Improvement Alberta. Additional Project Teams will be established as needed when additional projects or initiatives are added.
- **Ad-Hoc Committees:** Ad-hoc committees may be established for reviewing and recommending new projects or to solve emerging growth and yield issues.

COLLABORATION AND PARTNERSHIPS

The University of Alberta, an Associate Member of FGrOW, is a key partner in the delivery of FGrOW's program. In addition to housing the WESBOGY Project Team, it plays a key role in growth and yield research and training of new growth and yield practitioners. FGrOW will work with the university in three main areas:

- **Training.** Work with the university to ensure that students are receiving the practical education needed to fully understand the collection and analysis of tree and forest measurements.
- **Continuing education and extension.** Ongoing training and updating of practitioners regarding best practices and the use of growth and yield tools. FGrOW will work with the University to ensure timely and applicable transfer of knowledge to practitioners.
- **Research.** Engage in a dialogue with the U of A to ensure that their research program addresses industry needs while building capacity and experience.

FGrOW will also look to the rest of Canada for partnership and collaboration opportunities.

Expertise in growth and yield exists in other parts of the country, notably British Columbia, New

Brunswick, Ontario, and Quebec. FGrOW's long-term goal is to benchmark these programs, building on their experiences and identifying potential partners.

COMMUNICATIONS PLAN

FGrOW's primary focus is on communication with its members, which it does in four main ways:

1. Producing reports and summaries of findings from research and other projects.
2. Maintaining a website which makes reports and plans available to members and other interested parties.
3. Hosting an Annual General Meeting to report on results, discuss priorities and approve work plans.
4. Holding workshops or field tours to enable tech transfer.

ADMINISTRATION AND MANAGEMENT

One of the intents of forming FGrOW was to increase efficiencies in administration. Much of the administrative work that used to be part the original associations is now performed by FGrOW for all members, and the amount of time spent on administering and managing the association will be tracked independent of project work. Administration and management includes reporting, website maintenance, and communications and extension work conducted by the Director and Administrative Assistant that is not directly tied to any of the other projects. Funds to support administration and management come from FGrOW membership dues and project team contributions (Table 1).

Estimated costs for administration, management and development of FGrOW are detailed in Table 2. The estimated costs exceed the income through membership dues by \$17,799 (Table 1). Appendix 2 provides details of membership dues payable in 2016-2017.

The additional funds required will be contributed by project teams. Each project team will contribute 1.75% of its total income, or a minimum of \$2,000. Future FGrOW projects with external funding will be expected to plan to contribute and agreed upon amount to support the administration and development of FGrOW.

FGrOW will provide the following deliverables to its members:

- Annually updated business and work plans
- Annual report
- Mid-year report
- Annual General Meeting
- Annual Business Meeting
- An up to date public website
- A SharePoint site where members can access reports and information
- One technical session or workshop

Table 1. FGrOW administrative funds income summary.

Income	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Balance carry forward	0	9,820	5,381	933	-3,680	12,454
Membership dues	14,125	14,000	14,000	14,000	14,000	70,125
Enhanced Post Harvest	8,600	0	0	0	0	8,600
Foothills Pine Project Team	4,127	3,976	4,417	4,253	3,710	20,482
MPB PSP Project	5,125	0	0	0	0	5,125
Mixedwood Project Team	2,450	2,450	2,000	2,000	2,000	10,900
Policy & Practice Project Team	2,000	2,000	2,000	2,000	2,000	10,000
Tree Improvement Alberta	2,000	2,000	2,000	2,000	2,000	10,000
WESBOGY Project Team	3,318	3,059	3,059	3,059	3,059	15,554
Total	41,745	37,305	32,857	28,244	23,089	163,240

Table 2. FGrOW administration expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total
fRI Admin fees	3,600	3,600	3,600	3,600	3,600	18,000
Computer network	3,525	3,525	3,525	3,525	3,525	17,627
Insurance	1,399	1,399	1,399	1,399	1,399	6,995
Director	15,000	15,000	15,000	15,000	15,000	75,000
Administrative Assistant	6,000	6,000	6,000	6,000	6,000	30,000
Meetings and tours	2,000	2,000	2,000	2,000	2,000	10,000
Supplies	400	400	400	400	400	2,000
Total	31,924	31,924	31,924	31,924	31,924	159,622
<i>Balance</i>	<i>9,820</i>	<i>5,381</i>	<i>933</i>	<i>-3,680</i>	<i>-8,836</i>	

In 2016, FGrOW will increase its efforts in growth and development of the organization. It will continue to establish priorities for research and activities and will engage members in a discussion of priorities annually. If needed, it will hold a workshop to discuss FRIAA Open Funds opportunities and to identify proposals for FGrOW support. To identify other opportunities for funding, a review of existing grant or funding organizations will be conducted and partnerships with energy companies will be explored.

FGrOW members have recognized that a clear direction for the organization is critical to its success. Accordingly, finalization of the mission and vision that were developed through the road map exercise is a priority. New activities that were identified through the development of the mission and vision that are agreed by members to be high priority will also be implemented over the course of the year.

PROGRAM

The FGrOW Program is carried out by its six Project Teams: Empirical Post-Harvest, Foothills Pine, Mixedwood, Policy and Practice, Tree Improvement Alberta, and WESBOGY. The Project Teams are responsible for developing a work plan, timeline and budget for each of their projects, as well as for annual reporting. Project Teams will decide how best to carry out their project(s) and the extent to which the Director and Administrative Assistant will be involved either in project management or

technical work. The use of the Director and Administrative Assistant for project-specific support is to be funded via the project-specific funding.

An overview of each of the Project Teams and their key projects is given below.

EPH PROJECT TEAM

This project team was initiated to deliver the new project supported through FRIAA Open Funds: *Empirical Post-Harvest Stand Growth Assessment: Stand Structure Development and Growth*. This project builds on a 2008 project which collected data from post-harvest stands, with a focus on obtaining paired observations that represented growth trajectories in the 0-30 age range.

This extension of the 2008 project will focus on using these data and collect new data to improve our understanding of how juvenile post-harvest stands change over time, and what impacts silviculture treatment has on these stands; specifically:

1. Changes in stand succession and forest structure over time, important for providing non-timber (social and ecological) values in addition to wood production.
2. The ability of growth models to forecast post-harvest conditions relative to observed growth patterns and silviculture treatments.
3. An understanding of the impacts of management interventions (site preparation, reforestation methods and vegetation control) on reforestation success and growth.

Work on the project was initiated in December, 2015. The bulk of the work to date has consisted of data collection in preparation for data assembly. Assembly of existing plot and regeneration survey data with repeated observations on the same stands will allow selection of sites for re-measurement, which is scheduled for fall of 2016. Analysis of data and comparison with growth models will follow. The project is scheduled for completion in December 2017.

Total funding for the project is \$491,500. Table 3 outlines projected expenses for the EPH Project Team for the period April 1, 2016 to March 31, 2018.

Table 3. EPH Project Team Expense Summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Project Management	4,000	2,769	0	0	0	6,769
Data assembly	66,000	0	0	0	0	66,000
Field work	246,400	18,000	0	0	0	264,400
Analysis	30,000	107,500	0	0	0	137,500
FGrOW Administration	8,600	0	0	0	0	8,600
Total	355,000	128,269	0	0	0	483,269

FOOTHILLS PINE PROJECT TEAM

The Foothills Pine Project Team (FPPT) continues the work of the Foothills Growth and Yield Association (FGYA), which formed in 2000 to co-operatively forecast and monitor managed stand growth and yield in Lodgepole pine. It was run as an association under fRI; its membership consisted of 9 companies holding Forest Management Agreements on the Eastern Slopes of Alberta. Stand Dynamics after MPB Attack. Details of the work completed by the FGYA can be found in annual reports and other technical documents, as well as in *Progress and Achievements: Foothills Growth and Yield Association the First Decade April 2000 to March 2010*. All of these documents are available on the fRI Research website.

The focus of the FPPT, which was assumed from the FGYA, is:

- Forecasting and monitoring responses to silvicultural treatments;
- Facilitating the scientific development and validation of yield forecasts used by members in managing their tenures;
- Promoting knowledge, shared responsibility and cost-effective cooperation.

The Foothills Pine Project Team has four active projects:

- The Regenerated Lodgepole Pine (RLP) Project ;
- Cooperative Management of Historical Research Trial;
- Stand Dynamics after MPB Attack; and
- Establishment of PSP Network to Monitor Stand Dynamics and Establish Yield Curves for Stands Killed by MPB.

REGENERATED LODGEPOLE PINE

The main focus of the FGYA was the Regenerated Lodgepole Pine (RLP) project which assessed site and treatment effects on stand development following harvesting and planting of lodgepole pine, including:

- The effects of site, planting density and weeding on early crop performance;
- The effects of site, planting density, weeding and thinning on subsequent growth and yield;
- The link between early crop performance and subsequent growth and yield.

The RLP project consists of a long-term field trial, established in 2000 and 2001, and interim forecasting of effects using available models and data. Details of the design, installations and procedures are provided in an *Establishment Report* (April 2003) and a periodically updated field manual.

Details of the trial and its results to date are reported in the annual crop performance report, the most recent of which is *Regenerated lodgepole pine trial: crop performance report, March 2015*.

The RLP trial has led to the initial development and review of a decision support tool (FRIPSY: the Foothills Reforestation Integrated Planning System) that allows managers to predict establishment and performance results based on site, stand, site preparation, planting, and vegetation management

factors. A multi-disciplinary task force of 8 growth and yield and silvicultural practitioners reviewed the tool in 2013, and provided invaluable advice on its development. Enhancements to the user interface, establishment survey projection and top height projection were completed in June 2014. Enhancements made in 2015 included: aspen performance prediction, site preparation responses, prediction to 14 years after cut, extended range of planting years.

A workshop was held in June 2015 for user training and feedback. Following the workshop, stocking adjustments and model corrections were made and the batch processor was updated to incorporate enhancements. A climatic risk variable which improved mortality predictions was added to the base model as result of climate study discussed below.

In 2016, adjustments will be made to FRIPSY version 3 based on results of operational validation and 2016 data and a paper devoted to FRIPSY will be prepared for submission to the Forestry Chronicle or other publication. The FPPT will host a workshop to discuss the application of FRIPSY and implications of climate impacts on pine mortality, management and research in 2016.

In view of growing interest in the effects of climate change on regeneration survival and growth, and observed variation in crop performance likely to be linked to local climate, exploratory analyses were conducted during 2007 linking growth and mortality during the first 5 years of the trial to regional and locally-interpolated climate records. Following a preliminary study of the RLP trial planted stock results (Interim Technical Note, February 2009), the work was expanded to include data from an earlier study of natural regeneration conducted by the CFS (*Technical Note 2010-3*, February 2010). Further analyses were conducted in 2010 and 2011, and a draft scientific paper was presented for membership review in March 2012. Results have been used in development of the regeneration model and to map health and mortality risks throughout the foothills region. In 2015-16, an in-depth analysis of the impacts of climate on juvenile lodgepole pine mortality was completed (*Impact of Climate on Juvenile Mortality and Armillaria Root Disease in Lodgepole Pine*). The resulting report is awaiting members' consideration before being adapted and submitted for publication.

A strategy for transition from the regeneration phase measurements to measurements in the growth phase of stand development was prepared in 2015 (*Strategy for Continuation of the Foothills Growth and Yield Association's Regenerated Lodgepole Pine Trial*, W.R. Dempster, January 19,2015). Three companies piloted the new growth phase measurements in 2015 and the data collected was assessed (*Foothills Pine Project Team—Regenerated Lodgepole Pine Trial—Assessment of Data Collected in 2015*). Members will use this as a basis for deciding how to proceed with measurements prior to the 2016 field season.

Costs of fieldwork are incurred directly by each member for those installations (clusters of 4 experimental plots) located on their forest management area. Work is administered directly by the member, with the FGrOW playing a coordination and quality control role. FRIP funding for continuation of the Project was approved by FRIAA as part of a larger project to facilitate payment of FGrOW membership dues (Project #FOOMOD-01-012: *Support for Forest Growth Organization of Western Canada*).

Members wishing to use FRIP funds to cover their trial measurements will submit to FRIAA:

- A supplementary proposal summary application referencing the umbrella proposal;
- A proposed payment schedule;
- Annual financial and work verification reports.

Estimated measurement costs shown in Table 4 for the RLP Trial are approximate expectations based on the work schedule shown in Table 4; they should be regarded as only indicative orders-of-magnitude of the actual costs to be incurred by members. Measurement costs per installation are assumed at \$4,000.

Table 4. Regenerated Lodgepole Pine project –Scheduled measurements by FMA and estimated measurement costs.

Agency	2016	2017	Measurement Costs 2016	Measurement Costs 2017
ANC	6		24,000	0
BRL	6		24,000	0
CFPGP	6		24,000	0
MWFP	6		24,000	0
SDA (EFP)	6		24,000	0
SLS	6		24,000	0
SPI		14	0	56,000
WEYDV	6		24,000	0
WEYED	6		24,000	0
WEYGP	16	2	64,000	8,000
WWC (HWP)	9	12	36,000	48,000
Total	73	28	292,000	112,000

Estimated costs for the RLP project for the period April 1, 2016 to March 31, 2021 are summarized in Table 5. A detailed summary of deliverables and next steps is in Appendix 3.

Table 5. Regenerated Lodgepole Pine project expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
R&D Associate	61,740	65,000	65,000	65,000	65,000	321,740
Coordinator	20,000	20,000	20,000	20,000	20,000	100,000
Field Auditor	20,000	10,000	20,000	10,000	20,000	80,000
Database	25,000	25,000	25,000	25,000	25,000	125,000
Other technical	20,000	10,000	10,000	10,000	10,000	60,000
Admin. Assistant	2,000	2,000	2,000	2,000	2,000	10,000
Meetings	2,000	2,000	2,000	2,000	2,000	10,000
Total	150,740	134,000	144,000	134,000	144,000	706,740

COOPERATIVE MANAGEMENT OF HISTORICAL RESEARCH TRIALS

Beginning in the late 1930 and ending in 1980s, the Canadian Forest Service (CFS) established a number of trials in lodgepole pine stands throughout Alberta. These trials are considered invaluable resources for monitoring and demonstrating the effects of nutrition and density management. Since 2002, the FGYA, Alberta Agriculture and Forestry (AF) and the Canadian Wood Fibre Centre (CWFC) of the CFS have had a signed agreement for cooperative management of the trials. The FGYA was responsible for measurements, maintenance and support for analytic work; FGrOW has assumed these responsibilities.

Detailed information on the trials is found in *Long-term Lodgepole Pine Silviculture Trials in Alberta: History and Current Results*. Details on measurements conducted by the FGYA can be found in their annual reports. The measurement schedule for the next 5 years and associated cost estimates are in Table 6.

There are no measurements scheduled for 2020-21 and the current FRIAA project ends on March 31, 2020. In 2016-17, an assessment of the trial measurement schedule will be conducted and recommendations for continuing the trial past 2020 will be developed.

Table 6. Cost schedule for FGYA contribution to Cooperative Management of Historic Research Trials project.

Trial	Man days	2016-17	2017-18	2018-19	2019-20	2020-21 ¹	Total 2016-21
McCardell 1984 fertilization & thinning	36	0	0	0	22,000	0	22,000
Mackay thinning (A34)	56	0	0	33,600	0	0	33,600
Swan Lake thinning 1977	8	0	0	4,800	0	0	4,800
Teepee Pole Spacing 1967	20	0	0	0	0	0	13,000
Gregg spacing 1963	46	27,600	0	0	0	0	27,600
Gregg spacing (Medium)	11	0	0	0	7,000	0	7,000
Kananaskis European thinning (K-3)	18	0	0	0	0	0	0
Kananaskis economic thinning (K-58)	4	0	10,800	0	0	0	10,800
Clearwater fertilization & thinning 1968	22	0	2,400	0	0	0	13,500
Strachan Thinning 1952	0	0	0	0	0	0	0
Fertilization and Thinning Takyi Trials (SRD)	75	0	0	0	0	0	0
Quality Control	0	2,000	2,000	2,000	2,000	0	10,000
Signage, Equipment		0	0	0	0	0	5,000
Total Annual Expense		29,600	15,200	40,400	31,000	0	142,300

Since 2001, the FGYA, and now FGrOW, have entered into contribution agreements with Natural Resources Canada to support analysis and modelling of the trial data through the Canadian Wood Fibre Centre. In 2016-17, FGrOW hopes to be successful in obtaining funds for a Contribution to the Forest Innovation Program to continue this work.

Table 7 summarizes all Foothills Pine Project Team costs for the Historic Research Trials for the period April 1, 2016 to March 31, 2021.

Costs incurred by the Foothills Pine Project Team for trial remeasurements will continue to be allocated among voting members according to the proportions of pine on their forest management areas (Appendix 4). The agreement approved by FRIAA: *Measurement and Maintenance of Historic Research Trials* (February 2015, FRIAA Project # FOOMOD-01-11) covers measurements for a five year period ending in 2019. The funding of measurements is subject to annual review of priorities by all three parties (FPPT, AF and the CFS), approval each year by the Foothills Pine Project Team, and acceptance by FRIAA.

Table 7. Project Team costs for *Cooperative Management of Historic Research Trials* project.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
Member Contribution	17,020	8,740	23,230	17,825	0	66,815
FRIAA	12,580	6,460	17,170	13,175	0	49,385
CWFC CFS Contributions	45,000	50,000	50,000	50,000	50,000	245,000
Total Income	106,434	65,200	90,400	81,000	50,000	361,200
Expense						
R&D Associate	4,410	4,700	4,700	4,700	4,700	23,210
Coordinator	3,200	3,200	3,200	3,200	0	12,800
Admin. Assistant	350	350	350	350	0	1,400
Measurements	29,600	15,200	40,400	31,000	0	116,200
Analysis & Modelling	41,400	46,400	46,400	46,400	46,400	227,000
CA Admin	3,600	3,600	3,600	3,600	3,600	18,000
Total Expense	82,560	73,450	98,650	89,250	54,700	398,610

STAND DYNAMICS AFTER MPB ATTACK

The mountain pine beetle monitoring project, *Stand Dynamics after MPB Attack*, was originally called *Regeneration Management in a Mountain Pine Beetle Environment* and was initiated as a result of a field tour to MPB-attacked areas around Prince George, BC in 2007. This project included 1) development of a Decision Support Tool intended to help managers decide on priorities for salvage and treatment in MPB attacked stands using the best available information, and 2) monitoring of PSPs attacked by MPB to assess stand response. The Decision Support Tool was completed in 2012 (*Enhanced Mountain Pine Beetle Decision Support Tool Application Development*, ForCorp Solutions, December, 2012).

Monitoring of attacked stands is on-going with support for field work in 2016 being provided by the fRI Research Mountain Pine Beetle Ecology Program (MPBEP). Given the importance of this program in

being one of the earliest in Alberta to begin assessing the impacts of MPB attack, alternate avenues for funding should be identified to ensure continuation of the project.

The database has been updated to include both the measurements collect in 2014 and 2015 and the database technical report has been completed. Continued delays in availability of the 2014 data mean that completion of the following Quicknotes will be delayed until early 2016-17:

- Quicknote 2 Tree mortality in attacked stands – preliminary results; and
- Quicknote 3 Progress report

Forty-two plots are scheduled for measurement in 2016. Final deliverables to the MPBEP will be a scientific description of analyses and results, including quantitative models of mortality and regeneration trends (manuscript prepared for Canadian Journal of Forest Research or other peer reviewed publication) and a description of results and management implications (manuscript prepared for Forestry Chronicle or other professional journal). These are scheduled for completion by March 31, 2017.

Table 8 summarizes expenditures for the Stand Dynamics after MPB Attack for the period April 1, 2016 to March 31, 2021.

Table 8. Expense summary for *Stand Dynamics after MPB Attack*.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
MPBEP Grant	53,200	0	0	0	0	53,200
Total Income	53,200	0	0	0	0	53,200
Expenses						
Field measurements	53,200	0	0	0	0	53,200
R&D Associate	17,640	0	0	0	0	17,640
Coordinator	10,000	0	0	0	0	10,000
Administrative Assistant	700	0	0	0	0	700
Total Expenses	81,540	0	0	0	0	81,540

ESTABLISHMENT OF PSP NETWORK TO MONITOR STAND DYNAMICS AND ESTABLISH YIELD CURVES FOR STANDS KILLED BY MPB

As a result of significant in-flights of mountain pine beetles coming from British Columbia in 2006 and 2009, as well as subsequent local production, there are widely distributed pine dominated stands throughout Alberta that have been significantly affected by MPB-caused mortality.

While there is a substantial network of government and industrial PSPs throughout the province, the number of plots in pine dominant stands with significant mortality is limited. As a result, there is limited information available to analyze and make statistically sound conclusions regarding the effects of MPB

on stand dynamics, the likely regeneration outcomes in pine dominated stands killed by MPB, and projected growth trajectories of these stands.

The objectives of this project are:

1. To create a permanent sample plot network in pine dominated stands (>50% of stand) with existing high rates of MPB-caused mortality (>20% of total basal area) that have not had any post-MPB attack treatment. This will provide statistically sound data regarding stand dynamics, regeneration recruitment, and growth rates across a range of natural sub-regions and ecosites at varying rates of mortality. The plots will be measured at 5-year intervals to capture the dynamic change in killed stands.
2. To provide predictive ability for assessing recovery rates for ecosystem function through analysis of the plot data through time. This is critical for prioritizing stands for rehabilitation.

Field crews are in the process of establishing new PSPs in attacked stands and measuring existing PSPs that have been attacked. The goal is to have 160 plots in stand heavily impacted by MPB attack throughout the Central Mixedwood, Dry Mixedwood, Lower Boreal Highlands, Upper Boreal Highlands, Upper Foothills, and Lower Foothills natural subregions. Field work is expected to be complete by December 31, 2016. The following expenses are planned in the 2016-17 fiscal year.

Table 9. Expense summary for MPB PSP project.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
FRIAA MPB Grant	371,381	0	0	0	0	371,381
Total	371,381	0	0	0	0	371,381
Expense						
Field measurements	223,374	0	0	0	0	223,374
Coordinator	10,000	0	0	0	0	10,000
Administrative Assistant	15,000	0	0	0	0	15,000
Field auditing	25,000	0	0	0	0	25,000
GIS support	5,500	0	0	0	0	5,500
Admin, supplies, travel	7,500	0	0	0	0	7,500
FGrOW Admin	6,499	0	0	0	0	6,499
Total Expenses	292,874	0	0	0	0	292,874

The project is being funded by the FRIAA Mountain Pine Beetle Rehabilitation Program.

FOOTHILLS PINE PROJECT TEAM FINANCIAL SUMMARY

Table 10 summarizes the income and expenditures of the Foothills Pine Project Team for the period April 1, 2016 to March 31, 2021.

Table 10. Foothills Pine Project Team financial summary.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
Balance carry forward	109,523	18,230	24,504	20,337	26,335	198,930
Membership dues (direct)	54,000	90,000	90,000	90,000	90,000	414,000
Membership dues (FRIAA)	54,000	72,000	72,000	72,000	72,000	342,000
HRT Management	74,600	65,200	90,400	81,000	50,000	361,200
MPB Monitoring	53,200	0	0	0	0	53,200
MPB PSP	292,874		0	0	0	292,874
Total Income	638,197	245,430	276,904	263,337	238,335	1,662,204
Expenses						
RLP Project	150,740	134,000	144,000	134,000	144,000	706,740
HRT Management	82,560	73,450	98,650	89,250	54,700	398,610
MPB Monitoring	81,540	0	0	0	0	81,540
MPB PSPs	291,500	0	0	0	0	291,500
Administrative Assistant	1,000	1,000	1,000	1,000	1,000	5,000
Coordinator	8,000	8,000	8,000	8,000	8,000	40,000
FGrOW Admin	4,127	3,976	4,417	4,253	3,710	20,482
Weslowsky Scholarship	500	500	500	500	500	2,500
Total Expenses	619,966	220,926	256,567	237,003	211,910	1,546,372
<i>Balance</i>	<i>18,230</i>	<i>24,504</i>	<i>20,337</i>	<i>26,335</i>	<i>26,425</i>	

MIXEDWOOD PROJECT TEAM

The Mixedwood Project Team (MPT) continues the work of the Mixedwood Management Association (MWMA). The MWMA acted as a forum to collectively address practical and scientific issues around the implementation of managing mixedwood stands to sustain their mixed species characteristics. The Association goals were to:

- Increase knowledge through financial and in-kind support of basic and applied research;
- Enhance the forest community’s understanding of mixedwood through support for workshops and conferences; and
- Increase information collection, sharing, dissemination, and application to day-to-day forest management activities.

The MWMA officially came into existence in the summer of 2001 with the signing of the Memorandum

of Understanding between the eight member companies and Alberta Sustainable Resource Development (now Alberta Agriculture and Forestry). Originally hosted by the Alberta Research Council, it resided at the University of Alberta from June of 2003 until March 2015. The MWMA supported numerous projects completed through the University of Alberta, and provided more than \$750,000 of direct funding. Details of research completed are seen in *Mixedwood Management Association Historic Report 2001-2015* (March 2016).

The MWMA's two long-standing projects, the Dynamic Aspen Density Experiment (DADE) and the Strip Cut Understory Protection Trial (SCUP) are being continued by the MPT.

DYNAMIC ASPEN DENSITY EXPERIMENT

Although mixedwood stands containing hardwood and white spruce occur naturally across the boreal landscape, the presence of hardwoods in cutovers planted with white spruce is often cause for concern for silviculturists. There are perceived risks associated with growing white spruce in pure (C) and mixed (CD and DC) regenerating stands. It is well documented that there are both positive (e.g. protection from frost, decreased winter desiccation, reduced weevil strike incidences, and improved nutrient cycling through aspen leaf litter fall) and negative (e.g. reduced transmission of light through aspen canopy, mechanical damage to white spruce by overtopping hardwood, and below-ground competition for moisture and nutrients) effects of hardwoods on white spruce. However, it is not clear how these effects combine to influence the progression of stand development through time. In addition, the kinds of stand conditions that create positive or negative effects of aspen on white spruce are not well understood.

The objectives of Dynamic Aspen Density Experiment (DADE) are:

1. To identify the thresholds in hardwood density that determine stand condition during each of two stand development stages;
2. To determine the survival and growth of white spruce in different stand conditions during each of two stand development stages;
3. To determine the opportunity cost to hardwood production of optimizing white spruce survival and growth; and
4. To provide credible data with which to develop science-based alternative regeneration standards for mixtures of white spruce and aspen.

The Dynamic Aspen Density Experiment is investigating white spruce growth response to varying aspen overstory densities at two ages of stand development. For this purpose, seven 17- and seven 22-year old stands were selected with aspen densities greater than 10,000 stem per ha and planted white spruce at densities of at least 1000 stems per ha. Five density treatments were conducted in each stand: aspen densities were thinned to 0, 1000, 2500 or 5000 stems per ha and an un-thinned plot served as control. In the center of each treatment, a 400m² Permanent Sample Plot (PSP) was installed and densities, heights and diameters of aspen and spruce were measured pre- and post-thinning.

The experimental design is described in detail in *Dynamic Aspen Density Experiment for Crop Planning in the Boreal Mixedwoods of Alberta, Project Manual*, Revised December, 2009. Details of analyses completed to date are contained in the DADE annual reports, the most recent of which is *Dynamic Aspen Density Experiment 2015 Final Report, OF-06-P013*, January 2016. The 2011 and 2012 annual reports contain results of analysis and comparisons with GYPSY and MGM projections. These documents are available on the FGrOW website. Table 11 summarizes the location and timing of the plot establishments. In 2015, the third of three installations destroyed by herbicide was replaced with a new installation on the Tolko High Prairie FMA.

Table 11. Summary of DADE establishment locations and timing.

Installation Number	Company FMA	Location	Establishment Date	3-Year Measurement Date	8-Year Measurement Date	13-Year Measurement Date
CM 17-1	Al-Pac	Touchwood Lake Road	September, 2007	September, 2010	Fall 2015	2020
CM 17-2	Al-Pac	Al-Pac "C" Road - Martinni	November, 2007	September, 2010	Fall 2015	2020
CM 17-3	Weyco	Sinkhole Lake, Drayton Valley	September, 2009	May/June, 2013	Fall 2017 or early 2018	2022
CM 17-4	Weyco	Sinkhole Lake, Drayton Valley	September, 2009	May/June, 2013	Fall 2017 or early 2018	2022
CM 17-5	Weyco	Sinkhole Lake, Drayton Valley	September, 2009	May/June, 2013	Fall 2017 or early 2018	2022
CM 17-6	Weyco	Sinkhole Lake, Drayton Valley	October, 2009	May/June, 2013	Fall 2017 or early 2018	2022
CM 17-7	Weyco	Sinkhole Lake, Drayton Valley	Sept/Oct, 2009	May/June, 2013	Fall 2017 or early 2018	2022
CM 22-1	Al-Pac	Al-Pac 1000 Road	October, 2007	September, 2010	Herbicide	Herbicide
CM 22-2	Al-Pac	Al-Pac 1000 Road	October, 2007	September, 2010	Fall 2015	2020
CM 22-3	Al-Pac	Al-Pac 1000 Road	Sept/Oct, 2008	Herbicide	Herbicide	Herbicide
CM 22-4	Al-Pac	Al-Pac 1000 Road	Sept/Oct, 2008	Herbicide	Herbicide	Herbicide
CM 22-5	DMI	South Harmon Valley MOF	September, 2008	October, 2011	Fall 2016	2021
CM 22-6	DMI	Kimewan Lake MOF	October, 2008	October, 2011	Fall 2016	2021
CM 22-7	DMI	South Harmon Valley MOF	October, 2008	October, 2011	Fall 2016	2021
CM 22-8	MWFP	Fort Assiniboine	September, 2013	2016	2021	2026
CM 22-9	MWFP	Fort Assiniboine	September, 2013	2016	2021	2026
CM 22-10	Tolko	High Level	May 2015	2019	2023	2028

Planned expenses for the DADE project are summarized below. In addition to 8-year measurements on three installations and 3-year measurements on two replacement installations, a project plan will be developed for the DADE. It will include:

- An updated measurement schedule,
- A plan for timing and extent of analysis, and
- A description of type and timing of communication and extension products.

Table 12 summaries planned expenditures for the DADE for the period April 1, 2016 to March 31, 2021.

Table 12. DADE expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Measurements	40,000	71,441	27,000	0	25,469	163,910
Analysis	0	0	30,000	0	0	30,000
Coordinator	5,000	3,200	5,000	1,000	5,000	19,200
Field Auditor	2,000	2,000	1,000	0	1,500	6,500
Admin. Assistant	3,500	3,500	3,500	1,000	3,500	15,000
Total	50,500	80,141	66,500	2,000	35,469	234,610

STRIP CUT UNDERSTORY PROTECTION TRIAL

While the strip-cut understory protection harvest is being increasingly adopted across Alberta, there is a lack of information on how residual spruce in removal strips respond to release and how successful aspen regeneration occurs on the extraction trails, which leaves uncertainty on the development of mixedwood stands after treatment. However, it is expected that protecting understory white spruce during removal of overstory aspen will ensure the utilization and release of advanced spruce growth, which will result in a shortened rotation, reduction of reforestation cost, and eventually an increase of timber production per unit of land.

The Strip Cut Understory Protection Trial (SCUP) project aims to fill the information gap required for growth and yield projection of aspen-dominated mixedwood stands treated with strip cut understory protection harvest. The objectives are to provide:

1. A measurement protocol to collect statistically valid data for describing the block-level stand performance following Strip Cut Understory Protection harvesting;
2. A protocol that is sufficiently flexible in order to be used by numerous companies, and to account for operational differences in the application of Strip Cut Understory Protection systems;
3. Re-measured data to quantitatively describe the post-harvest development of stands after Strip Cut Understory Protection harvest treatments;
4. Information required for growth model development and/or model calibration, with the potential for future use in process-based modelling; and
5. A monitoring protocol that is acceptable to the Alberta Agriculture and Forestry, for use in monitoring and yield curve validation.

A total of 18 understory protection PSP installations were established: 5 in 2005 and 13 in 2007 (Table 15). Table 13 summarizes the location and timing of SCUP establishments and remeasurements.

Table 13. Summary of SCUP establishment locations and timings.

Location	PSP Installation #	Plot #s	Established	Re-measure 1	Site Index Measurement	Re-measure 2	Re-measure 3
Van	7012	6	2005	2010	spring 2012	2015	2020
Al-Pac	27131	6	2005	2010	spring 2012	2015	2020
Al-Pac	19191	6	2005	2010	spring 2012	2015	2020
Al-Pac	29691	6	2005	2010	spring 2012	2015	2020
Al-Pac	16751	6	2005	2010	spring 2012	2015	2020
Al-Pac	11911	6	2007	spring 2012	included	2016 or spring 2017	2021 or spring 2022
Al-Pac	22361	6	2007	spring 2012	included	2016 or spring 2017	2021 or spring 2022
Al-Pac	36551	6	2007	spring 2012	included	2016 or spring 2017	2021 or spring 2022
Al-Pac	36271	6	2007	spring 2014	needed	2018 or spring 2019	2023 or spring 2024
Al-Pac	36381	6	2007	spring 2014	needed	2018 or spring 2019	2023 or spring 2024
Al-Pac	34591	6	2007	2013	included	2018	2023
Al-Pac	27631	6	2007	2013	included	2018	2023
Al-Pac	15571	6	2007	2013	included	2018	2023
Ains	572	2	2007	spring 2014	needed	2018 or spring 2019	2023 or spring 2024
Tolko	330	2	2007	spring 2014	needed	2018 or spring 2019	2023 or spring 2024
Tolko	2212	2	2007	spring 2014	needed	2018 or spring 2019	2023 or spring 2024
Al-Pac	17781	6	2007	2013	included	2018	2023
Al-Pac	20631	2	2007	2013	included	2018	2023

Second remeasurements are scheduled for three blocks on the Al-Pac FMA. To ensure data quality, both field and office QC will be conducted. The SCUP database will be updated as measurements are completed. Preliminary analysis is planned for 2016-2017 based on the 5-year re-measurements that were completed in 2014 and will include comparing observed trends to MGM projections and assessing mortality and ingress. In addition to the scheduled measurements and analysis, a project plan will be developed for the SCUP. It will include:

- An updated measurement schedule,
- A plan for timing and extent of analysis, and
- A description of type and timing of communication and extension products.

Table 14 summarizes planned expenses for the SCUP project for the period April 1, 2016 to March 31, 2021.

Table 14. SCUP expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Measurements	58,000	0	64,300	65,590	84,985	272,875
Analysis	5,000	0	0	0	0	5,000
Coordinator	5,000	2,000	5,000	5,000	5,000	22,000
Field Auditor	2,000	0	2000	2000	2000	8,000
Admin. Assistant	3,500	1,000	3,500	3,500	3,500	15,000
Total	73,500	3,000	74,800	76,090	95,485	322,875

SILVICULTURE GUIDE

Beginning in 2003, the MWMA invested considerable resources in the development of a silviculture guide, the end result being an Excel 2003 tool for assessing outcomes of different mixedwood silviculture treatments. This tool no longer runs on current versions of Excel or Windows. In 2015-16 it was determined that the costs of revising the tool to run in current environments would be prohibitive. Instead, \$12,000 in the 2016-17 year have been allocated to determining how best to take the information from the Guide and make it accessible, and to proceed with the work.

MIXEDWOOD PROJECT TEAM FINANCIAL SUMMARY

Table 15 summarizes income and expenditures for the Mixedwood Project Team for the period of April 1, 2016 to March 30, 2021.

Table 15. Mixedwood Project Team financial summary.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
Balance carry forward	32,840	27,390	74,799	29,499	47,409	211,938
Membership dues	140,000	140,000	105,000	105,000	105,000	595,000
Total	172,840	167,390	179,799	134,499	152,409	806,938
Expenses						
SCUP Project	73,500	3,000	74,800	76,090	95,485	322,875
DADE Trial	50,500	80,141	66,500	2,000	35,469	234,610
Silviculture Guide	12,000	0	0	0	0	12,000
Administrative Assistant	5,000	5,000	5,000	5,000	5,000	25,000
Coordinator	2,000	2,000	2,000	2,000	2,000	10,000
FGrOW Admin	2,450	2,450	2,000	2,000	2,000	10,900
Total	145,450	92,591	150,300	87,090	139,954	615,385
<i>Balance</i>	<i>27,390</i>	<i>74,799</i>	<i>29,499</i>	<i>47,409</i>	<i>12,455</i>	

POLICY AND PRACTICE PROJECT TEAM

The Policy and Practice Project Team (PPPT) continues the work of the Alberta Forest Growth Organization (AFGO), which was created in 2009 by a partnership between the Alberta forest companies forming the Mixedwood Management Association (MWMA), along with Hinton Wood Products, Sundre Forest Products and Blue Ridge Lumber. AF was involved from the beginning as a non-voting member but subsequently joined AFGO as a full member, as did Edson Forest Products and Canadian Forest Products. AFGO's mandate was to expedite and co-ordinate the development of a recognized, secure and well-funded forest growth and yield sector in Alberta that operates effectively and efficiently to address emerging issues in all of Alberta's natural resource management sectors that require growth and yield knowledge and expertise for solutions.

This mandate is now being carried out by FGrOW. The Policy and Practice Project Team (PPPT) continues the AFGO initiatives that centered on improving forest management practice and influencing Alberta policy. It will provide a venue for discussions of forest management concerns. It is also hoped that the resulting policy recommendations will have applicability in other jurisdictions in Western Canada.

The PPPT will have four active projects in 2016-17:

- Provincial Growth and Yield Initiative
- Cutblock Inventory Classification Subcommittee
- Growth and Yield Model Support
- Communications with AFPA

PROVINCIAL GROWTH AND YIELD INITIATIVE

The objective of the Provincial Growth and Yield Initiative (PGYI), fondly referred to as “piggy”, is to collectively obtain data on tree growth through repeated measurements of Permanent Sample Plots (PSPs) to develop/calibrate/validate growth models for forest management yield curve development. This collaborative data collection is intended to benefit participating companies and AF by reducing their individual data collection requirements, as well as producing a superior dataset

The PGYI subcommittee was established in 2011 and currently consists of the following participants: Darren Aitkin (AF), Greg Behuniak (Weyerhaeuser), Katrina Froese (AF), Bob Held (SFP), Shongming Huang (AF), Tim McCready (Millar Western), Kerri MacKay (Weyerhaeuser), Sharon Meredith (FGrOW), and Melonie Zaichkowsky (Canfor). Their work has included:

- Developing a document describing the proposed initiative and presented it to interested organizations (*Provincial Growth and Yield Initiative*, September 2012).
- Producing a framework document describing how participation in PGYI fits with FMA holders' requirements for a growth and yield plan (*Framework for Alberta Growth and Yield Plans*, September 2012).

- Developing a “Best Practices Manual” to facilitate uniformity and consistency of data submitted by different companies and AF (*Minimum Standards and Suggested Protocol and Priorities for Establishing and Measuring Permanent Sample Plots in Alberta*, March 2014).
- Completing a gap analysis comparing existing PSPs with desired PSPs to fill a matrix of natural subregion and stratum combinations.
- Completing plot assignments for participating companies allowing trades between companies to utilize as many of the existing PSPs as possible.
- Contracting development of a web-based application for loading historic PSP measurements into the PGYI database (pgyi.tercera.com).

Participating organizations are currently converting their measurement data to the PGYI format and uploading their data. The next steps for the PGYI subcommittee include development of guidelines for implementing PGYI within a growth and yield program, and assessing the initial submission of historic PSP data.

In 2016-17, the PGYI Subcommittee will:

- Review submitted data including checking for data quality, testing validation rules built into the database app, and assessing how well target strata are being filled and how strata change over time,
- Assess options for hosting arrangements of the database application and needs for future development,
- Build on the 2012 *Framework for Growth and Yield in Alberta* to develop guidelines for developing a growth and yield plan using PGYI.

Table 16 summarizes planned expenditures for the PGYI project.

Table 16. PGYI expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Database development	0	0	0	0	0	0
Database hosting	17,000	17,000	17,000	17,000	17,000	85,000
Database testing	0	0	0	0	0	0
Database improvements	8,000	20,000	20,000	0	0	48,000
Coordinator	15,000	15,000	15,000	15,000	15,000	75,000
Application support	5,000	2,500	2,500	2,500	2,500	15,000
Total	45,000	54,500	54,500	34,500	34,500	223,000

CUTBLOCK INVENTORY CLASSIFICATION SUBCOMMITTEE

The Cutblock Inventory Classification Subcommittee was initiated in January 2015 to continue the work of the AFGO Strata Subcommittee. The Strata Subcommittee was formed in September 2012 to answer questions about the accuracy of the photo interpreted labels developed through Reforestation Standard of Alberta (RSA) performance survey programs, and whether the rules used to assign sampling units into strata were suitable for use in landbase stratum assignment.

The subcommittee's final report, *Report to AFGO Members from the Strata Subcommittee*, included a series of recommendations that were submitted to the RSA Management Committee, entitled:

- *Current and potential uses of RSA data and limitations;*
- *Use of MAI as a link between early stand performance and stand yield;*
- *Differentiating use of aerial stratification data for MAI assessment and for stratum assignment for timber supply analysis and strata reconciliation; and*
- *Use of stocking to assign RSA sampling units to strata.*

The Cutblock Inventory Classification Subcommittee (CICS) was formed to answer outstanding questions identified by the Strata Subcommittee. Its work focused on developing recommendations to Alberta Agriculture and Forestry on changes to the strata balancing and reconciliation processes. It met with representatives of AF on August 25, 2015 to present its proposal (*Proposed Changes to Strata Balancing and Reconciliation—Recommendations from the Cutblock Inventory Classification Subcommittee*).

In 2016-17, it is expected that CICS will complete its mandate. Its only planned tasks for the upcoming year are to follow up with AF for a formal response to its proposal; complete any follow-up activity required to finalize work of subcommittee, such as further discussions with AF; and to communicate the AF response to members. Expenses for the CICS are summarized in Table 17.

Table 17. CICS expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Coordinator	4,000	0	0	0	0	4,000
Analysis	0	0	0	0	0	0
Total	4,000	0	0	0	0	4,000

GROWTH AND YIELD MODEL SUPPORT

Growth and yield models that accurately forecast stand development and future yield are gaining more relevance as the forest is transitioning from un-managed, post-fire dominated stands to managed, post-harvest stands. Since only a few managed stands are approximately 50 years old, not enough data are available to enable the development of empirical yield curves. Hence, growth & yield models that were

built based on natural stand data but can be calibrated using the early stand development managed stand data, are the best option to forecast managed stand development and yield.

Two models, which have different strengths and weaknesses, are currently used by the Alberta forest industry for yield curve development, i.e. Growth and Yield Projection Systems (GYPSY) and the Mixedwood Growth Model (MGM). FGrOW will work with the model developers to support and facilitate enhancements through existing and new projects and data sharing. A first step to ensure this occurs is for the PPPT Coordinator to attend meetings of the GYPSY Advisory Committee and the MGM Strategic Development Team.

Until additional activities are agreed upon, the costs to conduct this project (Table 18) are limited to the Project Team Coordinator to attending approximately 6 meetings per year and posting meeting minutes to the FGrOW SharePoint site. The Coordinator will also provide a synopsis to members on pertinent information arising from the meetings. The usefulness of the Coordinator attending these meetings will be evaluated over time.

Table 18. Growth and Yield Model Support project expense summary.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Coordinator	8,000	8,000	8,000	8,000	8,000	40,000
Total	8,000	8,000	8,000	8,000	8,000	40,000

COMMUNICATIONS WITH THE AFPA

At the February 10th PPPT Plenary meeting, members agreed that there was value in attempting to open a dialogue with the Alberta Forest Products Association. They believe that the group could provide assistance to the Forest Management Committee of the AFPA when it needs to assess policy and procedures that have a technical growth and yield component.

Steve Blanton, co-chair of the FMC has been contacted about having the opportunity to make a presentation about FGrOW and its capabilities at a meeting of the FMC. It is hoped that this will lead to a continued relationship with the AFPA.

Table 19 summarizes expenses for this initiative.

Table 19. Financial summary for Communications with AFPA.

Expense	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Coordinator	5,000	5,000	2,000	2,000	2,000	16,000
Total	5,000	5,000	2,000	2,000	2,000	16,000

POLICY AND PRACTICE PROJECT TEAM FINANCIAL SUMMARY

Table 20 summarizes income and expenditures for the Policy and Practice Project Team from April 1, 2016 to March 31, 2021.

Table 20. Policy and Practice Project Team financial summary.

	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Income						
Balance carry forward	34,228	29,873	23,807	20,741	31,360	140,009
Membership dues	60,000	60,000	60,000	60,000	60,000	300,000
PGYI DB Cost-sharing	7,895	11,684	11,684	5,368	5,368	42,000
Total	102,123	101,557	95,491	86,110	96,728	482,009
Expenses						
PGYI	45,000	54,500	54,500	34,500	34,500	223,000
CICS	4,000	0	0	0	0	4,000
G&Y Model Support	8,000	8,000	8,000	8,000	8,000	40,000
AFPA	5,000	5,000	2,000	2,000	2,000	16,000
Administrative Assistant	4,000	4,000	4,000	4,000	4,000	20,000
Coordinator	4,000	4,000	4,000	4,000	4,000	20,000
FGrOW Admin	2,000	2,000	2,000	2,000	2,000	10,000
Meetings	250	250	250	250	250	1,250
Total	72,250	77,750	74,750	54,750	54,750	334,250
<i>Balance</i>	<i>29,873</i>	<i>23,807</i>	<i>20,741</i>	<i>31,360</i>	<i>41,978</i>	

TREE IMPROVEMENT ALBERTA

Tree Improvement Alberta (TIA) started in 2011 with an adhoc group of companies interested in tree improvement at a time following a period of severe economic downturn for the forest industry. Industry participants concerned over the continuity of funding program activities due to perceived insufficient return on investment and lack of clarity on how benefits of tree improvement might be realized. The group identified the need for greater communication and coordination amongst industry, government and academic representatives to create clear objectives for tree improvement in Alberta and mechanisms for achieving them. On November 8th, 2011 a workshop was held including senior level representatives from industry, government and academia to generate and discuss ideas towards a new tree improvement model for Alberta. In April of 2012, Tree Improvement Alberta became a consortium of industry and government representatives under the Foothills Research Institute (FRI).

Tree Improvement Alberta was established to facilitate the delivery of programs or projects related to forest genetics in Alberta. The initial project under TIA authority was the three-year *Tree Species Adaptation Risk Management* project funded by Climate Change and Emissions Management

Corporation (CCEMC). In 2016, TIA membership voted to transition into a project team of FGrOW. A new Terms of Reference for TIA was ratified by members in March of 2016

TIA's purpose is to:

- Advance forest genetics and tree improvement in Alberta by coordinating, implementing, or supporting collaborative research projects in forest genetics and operational tree improvement activities to maximize efficiency among its members and collaborators.
- Promote communication among members through business meetings, workshops and field excursions, which enhance learning and knowledge transfer making it easier for members and other stakeholders to coalesce to common tree improvement priorities in Alberta.
- Provide an avenue for constructive dialogue between forest companies involved in tree improvement and the Alberta government.
- Promote and facilitate communication among Forest Genetics, Growth and Yield, and Silviculture practitioners on all forest genetics related matters.
- Maintain communication and collaboration with the Alberta Forest Genetic Resources Council and other stakeholders with interest in the management of forest genetic resources in Alberta.

The role and function of TIA will continue to evolve to accommodate changes, emerging challenges and potential opportunities. Additional programs, projects, or other related work may be added in consultation with TIA membership.

The five year plan for TIA is to strengthen the purpose of TIA through pursuing funding opportunities to further the work started on climate change and adaptation as well as other forest genetics and tree improvement activities of interest to the membership. The current projects underway for TIA are :

1. *FRIAA Realized Gain Trials* project – the proposed objectives are to support the Controlled Parentage Programs (CPPs) in assisting with validation of the expected gain (area based volume at rotation) from deployment of improved stock through the installation of operational realized gain trials. These will be the first trials of their kind installed in Alberta, requiring significant dialogue with Government of Alberta (Alberta Agriculture and Forestry) staff to ensure that the design and subsequent results will be recognized as valid for integration into growth and yield models as these programs mature. All seedlots to be tested and produced from these programs, and their associated seed orchards, are for operational deployment with the intent of enhancing the value of the forest resources in Alberta. In addition, given the increasing constraints on the landbase due to mountain pine beetle and climate change in general and energy expansion in particular, genetic gain improvements may be necessary to sustain the current yields for the forest resources in Alberta through deployment of genetic superior seed.
2. *FRIAA Expanded Provenance and Progeny Trials for Climate Change Adaptation in Alberta* project – the proposed objective is to further test populations for adaptability to climate change. A primary forest management objective is to improve or sustain forest productivity and fibre supply. Climate change may reduce the productive forest landbase or render local populations unsuitable to a changed environment. Climate change adaptation activities mitigate

against potential loss of productivity and fibre supply. Populations suitable for future climate may come from other CPP regions or other parts of the province and is therefore necessary to have comprehensive testing across CPP regions.

3. TIA knowledge transfer activities such as workshops, field excursions, business meetings, as well as other activities are scheduled annually.
4. Other opportunities as they arise.

Table 21. Financial Summary for TIA Project Team.

Category	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Balance Forward	\$27,811	\$14,811	\$1,811	\$1,811	\$1,811	\$48,055
Membership dues ¹	\$0	\$0	\$13,000	\$13,000	\$13,000	\$39,000
Contribution to FGrOW Admin	-\$2,000	-\$2,000	-\$2,000	-\$2,000	-\$2,000	-\$10,000
Program Manager ²	-\$9,000	-\$9,000	-\$9,000	-\$9,000	-\$9,000	-\$45,000
Knowledge Transfer ³	-\$2,000	-\$2,000	-\$2,000	-\$2,000	-\$2,000	-\$10,000
Total	\$14,811	\$1,811	\$1,811	\$1,811	\$1,811	

¹Currently at 13 paying industry partners. GoA and UofA are non-paying members. 2016/17 using initial funds received from members to fRI.

²Assumes 1 day/month, other PM expenses covered through projects or other funding sources.

³Assumes one field tour (\$1,500) and one business meeting (\$500) per year. Workshops and other knowledge transfer sessions to be funded through projects or other funding sources.

WESBOGY PROJECT TEAM

The Western Boreal Growth and Yield (WESBOGY) Association first met informally in the mid-1980s and established its Association Agreement at the University of Alberta and 5-year business plan in 1996. In 2015 WESBOGY consists of 12 partners involved in forest growth and yield, stand dynamics, inventory and planning in western Canada. The Association works to improve the efficiency of growth and yield research and development efforts by facilitating data sharing; by supporting development of MGM and other growth and yield models; by developing and supporting the WESBOGY long-term study; and by providing a forum for communication.

WESBOGY became part of FGrOW in January 2016, but the majority of its work will continue to be carried out at the University of Alberta, with funding arrangements being described in an agreement between it and fRI Research.

The WESBOGY plan for the next five years is:

1. To continue analysis of the WESBOGY long-term study including:
 - a. Height, diameter, and density patterns for aspen in the natural plots;
 - b. Height and diameter growth of spruce and aspen in treated plots;
 - c. Mortality of spruce and aspen;
 - d. Recruitment (ingress) of new trees into natural and treated plots;

- e. Preparation of manuals, reports, papers, extension notes and posters for distribution to Members and for journal publication;
2. To continue development of MGM to improve its ability to represent stand responses to silviculture. This will include:
 - a. Refinement of mortality, breakup and self-thinning functions for aspen;
 - b. Evaluation of model sensitivity to site index;
 - c. Natural regeneration and ingress of white spruce and aspen;
 - d. Refine calibration for lodgepole pine;
 - e. Calibrate MGM for black spruce, jack pine and balsam poplar;
 - f. Model Validation and publication of results; and
 - g. Model demonstration and training.
 3. To update and maintain the WESBOGY long-term study data collection manual, the database, and the WESBOGY web site and SharePoint site.
 4. To seek to expand the scope of WESBOGY activities and influence by:
 - a. identifying and approaching potential new Members;
 - b. seeking opportunities and developing proposals for potential complementary funding from other agencies; and
 - c. working with other groups and co-operatives and to promote WESBOGY activities and information in growth modeling, silviculture practices and forest management activities.
 5. To organize the WESBOGY Project Team meetings.
 6. To review and update the list of priority and ongoing projects.
 7. To undertake high priority Sponsored Research Projects as recommended by the Steering Committee and approved by the Members.
 8. To work with Members in the development of proposals for high priority associated research projects.

Table 22 contains the budget estimates for the WESBOGY Project Team for April 1, 2016 to March 31, 2021.

Table 22. WESBOGY Project Team budget estimates for April 1, 2016 –March 31, 2021.

Planned Expenditures	2016-17	2017-18	2018-19	2019-20	2020-21	Total 2016-21
Research Scientist	94,662	100,502	129,520	136,406	140,498	601,588
Tech support	16,480	16,974	13,987	8,000	7,500	62,941
Grad students, research Projects	5,000	5,000	5,000	5,000	5,000	25,000
Project management	6,000	6,000	6,000	6,000	6,000	30,000
Travel	8,600	8,600	8,600	8,800	9,000	43,600
Supplies, equipment, coms	6,500	6,500	6,500	6,500	6,500	32,500
<i>Direct costs of research</i>	<i>137,242</i>	<i>143,576</i>	<i>169,607</i>	<i>170,706</i>	<i>174,498</i>	<i>795,629</i>
UofA Overhead (10%)	13,724	14,358	16,961	17,071	17,450	79,563
FGrOW Admin	3,318	3,059	3,059	3,059	3,059	15,554
<i>Administration Costs</i>	<i>17,042</i>	<i>17,417</i>	<i>20,020</i>	<i>20,130</i>	<i>20,509</i>	<i>95,117</i>
Total Planned Expenditures	154,284	160,993	189,627	190,836	195,007	890,746
Funding						
Outside Funding (UofA direct)	19,000	19,000	19,000	19,000	19,000	95,000
WESBOGY PT Dues	160,000	160,000	160,000	160,000	160,000	800,000
Total Funding	179,000	179,000	179,000	179,000	179,000	895,000
Severance Reserve						
Net contribution to reserve	26,900	13,450	13,450	13,450	13,450	80,700
UofA Overhead (10%)	2,690	1,345	1,345	1,345	1,345	8,070
Severance Reserve Contributions	29,590	14,795	14,795	14,795	14,795	88,770

FRIAA OPEN FUNDS AND OTHER EXTERNALLY FUNDED PROJECTS

In addition to the work directly supported by WESBOGY members, the project team contributes to the delivery of a number of other externally funded projects through the efforts of Drs. Bokalo and Comeau. These projects are mentioned in the WESBOGY work plan but, as funding is external to FGrOW, financials are not included.

Three of these projects are funded by FRIAA Open Funds and arose as a result of early discussions on research priorities among representatives of the four FGrOW founding associations. Workshops held in August of 2013 and 2014 led to the development of three successful proposals for FRIAA open funds. An early example of the benefits of collaboration, these projects are considered part of the FGrOW program and described below.

STAND DYNAMICS FOLLOWING CANOPY REMOVAL AND RELEASE OF ADVANCE REGENERATION IN ASPEN AND LODGEPOLE PINE DOMINATED STANDS

Sustainable forest management in Alberta is threatened by shrinking landbase (due both to the increasing need for protected areas and to energy sector activities), forest disturbance (due to MPB and fire), and climate change. Many aspen stands have abundant and vigorous advanced regeneration of white spruce. Merchantable aspen can be harvested while protecting this advanced regeneration; however, MGM and other models used to forecast future yields need to be refined to provide more accurate estimates of stand yields and implications of understory protection to both aspen and spruce yields. Accurately forecasting growth of advanced regeneration following death of lodgepole pine due to MPB is of vital importance to evaluating yield implications related to leaving these stands unsalvaged and for exploring alternative options. Growth models such as GYPSY and MGM that can forecast stand development are available. However, it is widely recognized that these models require work to improve their abilities to model responses of advanced regeneration to death and harvesting of overstory trees.

The objectives of this project are to improve our understanding and modeling of release responses of advanced regeneration and aspen regeneration/ingress dynamics following: 1) Understory protection harvest of aspen dominated stands with a white spruce understory; and 2) Mountain Pine Beetle induced mortality of overstory pine in stands with understory black spruce.

Project completion is scheduled for completion in March 2017. The industry lead for this project is Greg Behuniak, Weyerhaeuser Grande Prairie. The total project budget for 2014 to 2017 is \$298,878.

IMPROVED ESTIMATION OF TREE MORTALITY AND STAND BREAKUP

Better understanding and modeling of tree mortality is needed to improve characterization of stand dynamics and estimation of future stand conditions and yields. While stand density, tree age, tree vigour, and competitive status of a tree influence probability of survival, there is substantial variation in survival or mortality rates that are thought to reflect effects of climate, site, insects, and disease. Current mortality models implemented in the MGM rely on tree age, tree vigour and competition and do not perform consistently in predicting mortality and breakup of mature and overmature stands. As a consequence, while MGM validates well on average for Alberta mixedwood stands, it does not perform well for characterizing the successional dynamics of aspen and mixedwood stands that experience stand breakup earlier or later than the average.

The objective of this project is to develop improved models of survival probability for trembling aspen, balsam poplar, white spruce, black spruce, lodgepole pine and jack pine based on data from the extensive network of permanent sample plots in western Canada and collection of supplemental data. Models will consider interacting effects of climate, insects, tree size, tree age, stand characteristics, and site. Resulting predictive equations will be incorporated into MGM and GYPSY. End products from this project will include:

1. Equations for predicting survival probability;
2. Manuscript prepared for peer review on age structure of aspen dominated stands;
3. Manuscript on maximum density and aspen survival probability;
4. Manuscript on maximum densities of pine, spruce and mixed stands;
5. Manuscript on survival probabilities of balsam poplar, white spruce, black spruce and jack pine;
6. Revised version of MGM;
7. Manuscript on the validation and demonstration of MGM with these new functions;
8. Presentations demonstrating MGM and project results at growth and yield and other workshops and conferences; and
9. Report summarizing project results as a whole.

The project is scheduled for completion in 2017. Terry Kristoff of Alberta Plywood is the industry lead for the project. The total project budget is \$329,145.

IMPROVING SITE INDEX ESTIMATION FOR ALBERTA

Accurate determination of site index is critical to estimating potential yield of regenerating stands and is a key input into growth and yield models used in Alberta. However, accurately determining site index in stands that are less than 15 years of age is problematic since early growth of trees can be influenced by a number of factors. These factors include site conditions, climate trends, site preparation and competing vegetation. While site index could be estimated from measurement of the original preharvest stand, this may be inaccurate due to: 1) the advanced age of trees on the site (making accurate age determination problematic due to missing rings and stem decay); and, 2) the fact that naturally regenerated white spruce or black spruce often grow up under aspen or pine canopies and other vegetation during the first 60 to 80 years after regeneration. In addition, site index is difficult to estimate when there is a desire to establish and grow a species that was not present in the preharvest stand (eg. establishment of white spruce following harvesting of a pine or aspen stand), and data from the preharvest stand is of limited use. Promising alternatives to direct measurement of site index include the use of environmental information (i.e. climate, slope, aspect, soil moisture regime, soil nutrient regime), ecosite, and conversion equations between species. Where trees are of sufficient age, growth intercept methods may be used to estimate site index. This project will focus on development of site index estimators based on the use of the use of environmental and ecological data, species conversion equations, and growth intercept models.

The objective of this project is to develop tools that can be used for determining site index for trembling aspen, white spruce, and lodgepole pine in Alberta based on environmental factors, ecosite

classification, site index conversions between species, and growth intercept models. End products will include:

1. Equations for site index estimation for implementation in growth models;
2. A revised version of the Mixedwood Growth Model which includes these models for site index determination;
3. A detailed report on results from the project;
4. Data for further analysis; and
5. Two draft manuscripts ready for submission to peer reviewed journals.

Field work on the project began in 2015 and the project is expected to be completed in 2018. Tim McCready of Millar Western is the industry lead for the project. The total project budget is \$384,493.

2016-2017 WORK PLAN

Table 23 lists deliverables and deadlines for all projects in 2016-2017.

Table 23. 2016-2017 deliverables and deadlines.

2016-2017 Deliverables	Details and Deadlines
FGrOW Management and Administration	
<i>Administration</i>	
Annually updated business and work plan	Final 2016-2017 Plan, June 30, 2016. Draft 2017-2018 Plan, February 28, 2017.
Annual report	Draft 2016-2017 Report, April 1, 2017.
Mid-year report	Delivered at Fall Business Meeting.
Annual General Meeting	April 2017.
Fall business meeting & tech session	September 2016.
An up to date public website	On-going updates and maintenance.
SharePoint site for members	On-going updates and maintenance.
Invoice for membership dues	February 28, 2017.
Liaise with fRI Research	Attend monthly program lead meetings. Complete work plans and updates as required by fRI Research.
<i>Development of FGrOW</i>	
Establish priorities for research and activities	Hold discussion of priorities annually at AGM. Hold a workshop to discuss Open Funds proposals, annually, if needed
Identify other opportunities for funding	Conduct a review of granting or funding organizations, June 30, 2016. Explore partnerships with energy companies, July 31, 2016.
Road map	Finalize road map based on member input at April AGM, May 2016. Implement newly identified aspects of the road map identified as high priority by members, March 31, 2017.
EPH Project Team	
Data assembly	Assemble datasets and ARIS/Silviculture Information. Clean and validate data. Screen data and classify plots. Gap analysis and priority setting.
Fieldwork	Sample selection and sleuth opening locations. Develop and award field contract. Complete field sampling. Field QC, data review and cleaning.
Foothills Pine Project Team	
<i>Regenerated Lodgepole Pine Trial</i>	
Complete scheduled measurements	Pre-field season meeting for members and contractors, June 2, 2016.

	2016 measurement schedule, June 2, 2016. Measurements completed by October 30, 2016.
Updated field manual	Decide on changes to protocol based discussion at the November 10, 2015 meeting and analysis of trade-offs using on 2015 data. Revised by June 2, 2016.
Updated digital database	Loading database provided to contractors by June 30, 2016. Data submitted to database manager by November 30, 2016. Data loaded to master by December 31, 2016. Master database cleaned and approved by January 31, 2017.
Crop performance report	Updated based on 2016 measurements, March 2017.
FRIPSY Version 3	Adjustments made to version 3 based on results of operational validation and 2016 data. Paper devoted to FRIPSY for Forestry Chronicle or other publication.
Workshop	Application of FRIPSY and discussion of implications of climate impacts on pine mortality, management and research, June 2, 2016.
Extension	Complete Quicknote on RLP trial and application (subject to be determined), March 31, 2017.
<i>Cooperative Management of Historical Research Trials</i>	
Gregg Spacing 1963 remeasurement	Measurements completed and digital data available by October 30, 2016.
Support CWFC Wood Quality Analysis	Sign contribution agreement with NRCAN to enable analysis and modelling of historic research trial data by the Canadian Wood Fibre Centre, April 2016
<i>Stand Dynamics after MPB Attack</i>	
Detailed monitoring	Completed for 42 plots by September 30, 2016
Digital database	Updated for 2016 measurements by November 30, 2016 Database technical report, December 30, 2016
Publications	Quicknote 3 <i>Progress report</i> . Scientific description of analyses and results, including quantitative models of mortality and regeneration trends (manuscript prepared for Canadian Journal of Forest Research or other peer reviewed publication). Description of results and management implications (manuscript prepared for Forestry Chronicle or other professional journal). Quicknote 4 <i>Summary of results and implications</i> .
MPB Research Forum	Presentation, May 2016
<i>Establishment and Re-measurement of a MPS PSP Network</i>	
Phase one measurements	Field measurements completed by May 31, 2016. Field and office quality control of measurements

	completed by June 30, 2016. Digital data available by July 31, 2016. DRS applications for phase 1 completed by June 30, 2016.
Phase two measurements	Field measurements completed by December 31, 2016. Field and office quality control of measurements completed by January 31, 2017. Digital data available by February 28, 2017. DRS applications for phase 1 completed by December 31, 2016.
Policy and Practice Project Team	
<i>Provincial Growth and Yield Initiative</i>	
Review of submitted data	Review data submitted and determine how well the matrix is being filled, July 30, 2016.
Hosting arrangements and future development	Subcommittee will explore options and make recommendations for long-term hosting and future development, September 30, 2016.
Guidelines for implementing PGYI	Develop guidelines to help companies implement PGYI in the context of their growth and yield plans, March 31, 2017.
<i>Cutblock Inventory Classification Subcommittee</i>	
Wind down subcommittee	Follow up with GoA for response to proposed changes to strata balancing and reconciliation. Complete any follow-up activity required to finalize work of subcommittee. Communicate government response to members.
<i>Growth and Yield Model Support</i>	
Coordinator to attend meetings	Attend GYPSY Advisory Committee and MGM Strategic Direction Team meetings as scheduled. Meeting minutes posted to the FGrOW SharePoint. Provide summary to members after each meeting.
<i>Communication with AFPA</i>	
Initiate discussions with AFPA	Contact Forest Management Committee Chair to initiate discussions with AFPA regarding how FGrOW can help with technical review of growth and yield related policy, April 30, 2016. Next steps to be taken based on results of initial discussions, March 31, 2017.
Mixedwood Project Team	
<i>Dynamic Aspen Density Experiment</i>	
Re-measurements	8-year re-measurements completed on 3 installations, October 31, 2016. 3-year re-measurements completed on 2 installations, October 31, 2016.
Updated database	Complete data cleaning and loading, December 31, 2016.
Long-term plan	Complete a long-term plan for trial including timing and

	nature of analysis and extension activities, August 31, 2016.
<i>Strip Cut Understory Protection Trial</i>	
Re-measurements	Complete second re-measurement on three blocks, October 31, 2016.
Updated database	Clean and load 2016 measurements, November 30, 2016.
Long-term plan	Complete a long-term plan for trial including timing and nature of analysis and extension activities, August 31, 2016.
<i>Silviculture Guide</i>	
Scoping report	Scope ways to make work that went into the guide more useful, July 31, 2016.
WESBOGY Project Team	
Prepare draft Workplan for 2017/18	FGrOW Fall 2016 Meeting
Finalize Work Plan for 2017/18 activities	February 28, 2017
Annual report of activities	Prepared and provided by March 31, 2017
<i>WESBOGY Long Term Study</i>	
Maintain Long-Term Study database.	Ongoing
Long-Term Study Data Collection Manual	Providing guidance and direction relating to measurement and maintenance of installations. Ongoing
WESBOGY Long-Term Study Database	Maintain database and distribute data as required. Ongoing
WESBOGY SharePoint site	Maintenance ongoing.
Draft manual script on results of LTS to date	March 31, 2017
Results of analysis of LTS data	Presented at AGM, March 31, 2017
<i>MGM Development and Support</i>	
VSTO Version of MGM	Release beta version for testing, May 2016 Complete final version, December 2016
MGM Website and Documentation	Update for VSTO version., December 2016
Work plans and priorities for ongoing work on MGM	Developed through work with the MGM Strategic Development Team. Ongoing.
User support	Ongoing
Best Practices Documents	Development ongoing
<i>Externally Funded Research Projects</i>	
Enhancing Growth and Yield Data Collection Methods using Airborne Image Technology	Funding provided by AESRD to the U of A, 2015-2016. Ongoing. To be completed by March 31, 2017
Understory Protection Yield Curves for the Martin Hills FMA	Funded by S17 FMA group. Ongoing. To be completed by March 31, 2018
Stand dynamics following canopy removal and release of advance regeneration in aspen and lodgepole pine dominated stands	Funding through FRIAA Open Funds, 2014-2017. To be completed by December 31, 2017. Valerie Krebs MSc. Modeling release response of white spruce following understory protection harvest, August 31, 2016. Felix Oboite PhD. Modeling release response of black spruce and white spruce following mountain pine beetle induced mortality of lodgepole pine overstories, March

	31, 2018.
Improved estimation of tree mortality and stand breakup	Funding through FRIAA Open Funds, 2015-2017. To be completed by December 31, 2018.
Improving site index estimation for Alberta	Funding through FRIAA Open Funds, 2015-2018. To be completed by March 31, 2017.
Calibration and Validation of MGM for black spruce	Funding provided by Saskatchewan Ministry of Environment. To be completed by March 31, 2018.

Table 24 summarizes FGrOW income and Expenditures for all Project Teams for 2016-2017.

Table 24. 2016-2017 financial summary for all FGrOW Project Teams.

Income								
	Admin	EPH	FPPT	MPT	PPPT	TIA	WESBOGY	Totals
Carry forward	0	95,767	109,523	32,840	34,228	27,811	0	190,755
Membership Dues	14,125	0	108,000	140,000	60,000	0	160,000	482,125
Other contributions	27,620	275,000	420,674	0	7,895	0	19,000	830,276
Totals	41,745	370,767	528,783	172,840	102,123	27,811	179,000	1,503,156
Expenditures								
Admin	31,924	8,600	13,627	9,450	10,250	4,000	17,042	23,530
Projects	0	346,400	609,940	136,000	62,000	9,000	137,242	587,272
Total	31,924	355,000	623,566	145,450	72,250	13,000	154,284	610,802
<i>Balance</i>	<i>9,820</i>	<i>15,767</i>	<i>14,630</i>	<i>27,390</i>	<i>29,873</i>	<i>14,811</i>	<i>*24,716</i>	<i>192,379</i>

*The WESBOGY financial summary has been over-simplified in this table due to the relationship with the UofA and the difficulty of including details around the severance reserve.

APPENDIX 1: GROWTH AND YIELD GAP ANALYSIS AND RESEARCH PRIORITIES

GROWTH MODELLING

	Activity/Question	Project(s)	Group	Status
1.	Growth Model Development	Development and validation of MGM Development and validation of GYPSY	U of A AF	Ongoing Ongoing
2.	Volume Loss Factor development	Development for MGM	U of A	Ongoing
3.	Pine regeneration modelling	FRIPSY (Foothills Regeneration Integrated Planning System)	FPPT	Working version of model complete and being reviewed by FGYA members
4.	Mortality curves for young aspen (juvenile aspen stand dynamics)	Utilize WESBOGY LTS data	WESBOGY	Underway (Comeau and Bokalo)
5.	Projecting future yield and stand structure from young stand condition (characterizing future condition from performance survey data)	Sask Environment funding project by Kirk Johnson, Phil Comeau and Mike Bokalo <i>Empirical Post-Harvest Stand Growth Assessment: Stand Structure Development and Growth</i>	WESBOGY	Completed Initiated in 2015 and schedule for completion in 2017. Supported by FRIAA Open Funds
6.	Density management diagrams for aspen, white spruce and mixedwoods	Valentin Reyes-Hernandez and Phil Comeau	WESBOGY	Completed
7.	Improve understanding of factors influencing conifer natural regeneration – and model it.	FRIPSY (pine focus)	FPPT	See 3. above
8.	Better understanding and modeling of natural regeneration of spruce, aspen, pine	None		

	Activity/Question	Project(s)	Group	Status
9.	Linking site (eg wet areas mapping; edatope) to productivity	High precision prediction of site index and future yield by use of wet areas mapping and full feature LiDAR	WESBOGY	Gabriel Oltean (M.Sc), Phil Comeau and Mike Bokalo – work being done at Judy Creek and at WESBOGY LTS sites. Field work initiated April 2013 Thesis completed September 2016. Ivan Bjelanovic (MSc), Phil Comeau and Mike Bokalo – Work being done in southern portion of S17 – Started in 2014, thesis completion expected in summer of 2016.
10.	Determining appropriate site index (growth curves) for forest modeling			
11.	Model growth of stands after natural disturbance and harvest			
12.	Modeling young stand response to establishment and tending.	FRIPSY (pine focus)	FPPT	Ongoing
13.	Collect data across the provincial range of natural subregions and cover types in natural and post-harvest stands for use in growth model development.	Provincial Growth and Yield Initiative	PPPT	Ongoing
14.	Aspen break-up modelling	Improved Estimation of Tree Mortality and Stand Breakup	U of A (Comeau, Cortini)	Planned for completion in December 2017. Supported by FRIAA Open Funds
15.	Accurate modelling of changing seral stages throughout succession			
16.	Modeling partial harvest and dynamics of structured stands, understory projection, aspen- pine interactions, pine- black spruce mixes	Modeling release response of white spruce following understory protection harvest Modeling release response of black spruce and white spruce following mountain pine beetle induced mortality of lodgepole pine overstories	U of A (Krebs, Comeau) U of A (Oboite, Comeau, Bokalo)	Scheduled for completion August, 2016. FRIAA Open Funds. Schedule for completion March, 2018. FRIAA Open Funds.

	Activity/Question	Project(s)	Group	Status
17.	Quantifying and modeling treatment effects	FRIPSY	FFPT	On going
18.	Distance dependent models			
19.	Support for validation and documentation, best practices documentation, etc.			
20.	Incorporation of climate into MGM.	Improved Estimation of Tree Mortality and Stand Breakup	U of A (Comeau)	Climate variables are being included in analysis of tree mortality and will be included in mortality models
21.	Development of regeneration and updating of ingress models for use in MGM.			
22.	Tools for estimating site index that would work where good top height trees are not available.	Improving site index estimation for Alberta (based on climate and other ecological and topographic data)	U of A (Comeau)	Field data collection initiated in 2015 in northeastern Alberta and will continue in 2016 and 2017. Scheduled for completion in December, 2018. FRIAA Open Funds.
23.	Testing and validation of the multi-strata MGM model and other MGM improvements.		WESBOGY	Ongoing
24.	Quantifying the growth and yield outcomes of silviculture practices commonly applied to mixedwood or spruce sites	Remeasurement of mixedwood silviculture experiments: spot, band and patch treatments	U of A (Comeau)	Proposed project

SILVICULTURE TREATMENT AND GROWTH

	Activity/Question	Project(s)	Group	Status
25.	Silvicultural prescriptions to maintain mixedwood stands – radial herbicide treatment and thinning	Judy Creek	WESBOGY and CFS	10 th year measurement completed in 2012. Thinning completed 2012. Ongoing
26.	Influence of ecosite and treatment on lodgepole pine regeneration	Regenerated Lodgepole Pine Trials	FPPT	102 installations established between 2000 and 2001. On going
27.	Effect of density management on lodgepole pine	Historic Lodgepole Pine Trials	FPPT, AF and CFS	Various trials. On going
28.	What is the most economic method for producing a DC forest	None		
29.	Growth and yield implications of retention prescriptions	None		
30.	Growth and yield implications of harvesting to natural boundaries rather than rectangular blocks	None		
31.	Are there yield advantages to cutblock size when harvesting mixedwood blocks? What are the economic implications?	None		
32.	Effects of timing and radius of cutting on spruce growth and aspen resprouting	Effects of radius and timing of radial brushing treatments on aspen suckering and spruce growth - Field experiments near LacLaBiche and Judy Creek	U of A (Comeau)	Established in 2002 (Judy Creek), 2007 (Lac La Biche)
33.	Evaluation of banding as an alternative for establishing mixedwood stands	Comparison of banding (15 m bands treated with herbicide (vision and arsenal), arsenal spot treatment, radius brushing, and thinning	U of A (Comeau)	Initiated in 2006. 5 sites included in the study (established in different years)
34.	Site preparation effects on early growth of white spruce	EPH project may provide data to support this analysis.		

	Activity/Question	Project(s)	Group	Status
35.	Spruce growth in response to thinning aspen to different densities	Dynamic Aspen Density Experiment	MPT	11 existing installations established between 2007 and 2009.
36.	Spruce growth in response to thinning aspen to different densities	WESBOGY Long Term Study	WESBOGY	First installations established in 1990 and thinned in 1995. (2 replicate blocks at each of 11 locations). Ongoing. Analysis of data collected through spring of 2016 is planned with a manuscript to be completed for submission in early 2017.
37.	Stand development after strip cut understory protection harvest	Strip Cut Understory Protection (SCUP) Project Stand Dynamics Following Canopy Removal	MPT UofA (Comeau)	5 installations established in 2005 and 13 established in 2007. On going. See #19.
38.	Develop methods to integrate tree improvement into growth and yield estimates/models	Planned student/Post-doc project funded under chair in Tree Improvement	UofA (Thomas and Comeau)	Student starting in 2017 Height conversion values recommended by Rweyongeza (2013) are currently being tested in MGM.
39.	Design realized gain trial system to monitor deployment impacts	Realized Gain Trials Project funded by FRIAA in 2015	TIA	On going
40.	Establish realized gain trials for selected programs	See above.	TIA	
41.	White spruce release after understory protection	SCUP Stand Dynamics Following Canopy Removal	MPT UofA	See 38 above. On going
42.	Stand dynamics after partial harvest and effect of larger spruce on regenerating aspen	None		
43.	Site Index for white spruce understory after release	SCUP data may support this. See also #24		
44.	Black spruce productivity under different management practices and climate change	Calibration of MGM for Black Spruce (funded by Sask. Env.)	U of A (Comeau, Bokalo)	underway

	Activity/Question	Project(s)	Group	Status
45.	Incidental spruce replacement options-- putting spruce on deciduous sites	None		
46.	Stand break up regardless of species	Improved Estimation of Tree Mortality and Stand Break Up--#16	U of A (Comeau)	In progress
47.	Natural ingress over time in natural and managed stands			
48.	Managed forests-response to treatments			
49.	Bench marking study of 15-20 year old mixedwood stands and how they grow after fire compared to after harvest			

OTHER

	Subject	Project(s)	Group	Status
50.	Explore the effects of drought on aspen and spruce mortality	Analysis of WESBOGY Long Term Study Data and climate data	CFS (Hogg) and WESBOGY (Bokalo, Comeau)	
51.	Effects of aspen density on aspen and spruce wood quality	Could be addressed by collecting supplemental data at WESBOGY LTS, Judy Creek, DADE and other studies	WESBOGY	Proposal under development for supplemental crown and branch measurements on WESBOGY LTS sites, work limited by availability of funding
52.	Economics of mixedwood management options	None		
53.	Economic and yield implications of permanent gaps in forest stands and implications of efforts to regenerate gaps	None		

SILVICULTURE TREATMENT AND GROWTH

	Activity/Question	Project(s)	Group	Status
54.	Silvicultural prescriptions to maintain mixedwood stands – radial herbicide treatment and thinning	Judy Creek	WESBOGY and CFS	10 th year measurement completed in 2012. Thinning completed 2012. Ongoing
55.	Influence of ecosite and treatment on lodgepole pine regeneration	Regenerated Lodgepole Pine Trials	FPPT	102 installations established between 2000 and 2001. On going
56.	Effect of density management on lodgepole pine	Historic Lodgepole Pine Trials	FPPT, AF and CFS	Various trials. On going
57.	What is the most economic method for producing a DC forest	None		
58.	Growth and yield implications of retention prescriptions	None		
59.	Growth and yield implications of harvesting to natural boundaries rather than rectangular blocks	None		
60.	Are there yield advantages to cutblock size when harvesting mixedwood blocks? What are the economic implications?	None		
61.	Effects of timing and radius of cutting on spruce growth and aspen resprouting	Effects of radius and timing of radial brushing treatments on aspen suckering and spruce growth - Field experiments near LacLaBiche and Judy Creek	U of A (Comeau)	Established in 2002 (Judy Creek), 2007 (Lac La Biche)
62.	Evaluation of banding as an alternative for establishing mixedwood stands	Comparison of banding (15 m bands treated with herbicide (vision and arsenal), arsenal spot treatment, radius brushing, and thinning	MPT (Comeau)	Initiated in 2006. 4 sites included in the study (established in different years)

	Activity/Question	Project(s)	Group	Status
63.	Site preparation effects on early growth of white spruce	Included in #15 – Analysis to be based on available PSP and Performance Survey Data	WESBOGY (Comeau)	Underway
64.	Spruce growth in response to thinning aspen to different densities	Dynamic Aspen Density Experiment	MPT	11 existing installations established between 2007 and 2009.
65.	Spruce growth in response to thinning aspen to different densities	WESBOGY Long Term Study	WESBOGY	First installations established in 1990 and thinned in 1995. (2 replicate blocks at each of 11 locations)
66.	Stand development after strip cut understory protection harvest	Strip Cut Understory Protection (SCUP) Project Stand Dynamics Following Canopy Removal	MPT UofA (Comeau)	5 installations established in 2005 and 13 established in 2007. On going. See #19.
67.	Develop methods to integrate tree improvement into growth and yield estimates/models	Planned Post-doc project funded under chair in Tree Improvement	UofA	Start in 2015
68.	Design realized gain trial system to monitor deployment impacts	Realized Gain Trials Project funded by FRIAA in 2015	TIA	On going
69.	Establish realized gain trials for selected programs	See above.	TIA	
70.	White spruce release after understory protection	SCUP Stand Dynamics Following Canopy Removal	MPT UofA	See 38 above. On going
71.	Stand dynamics after partial harvest and effect of larger spruce on regenerating aspen	None		
72.	Site Index for white spruce understory after release	SCUP data may support this.		
73.	Black spruce productivity under different management practices and climate change	None		
74.	Incidental spruce replacement options-- putting spruce on deciduous sites	None		

	Activity/Question	Project(s)	Group	Status
75.	Stand break up regardless of species	Improved Estimation of Tree Mortality and Stand Break Up--#17	U of A (Comeau)	In progress
76.	Natural ingress over time in natural and managed stands			
77.	Managed forests-response to treatments			
78.	Bench marking study of 15-20 year old mixedwood stands and how they grow after fire compared to after harvest			

OTHER

	Subject	Project(s)	Group	Status
79.	Explore the effects of drought on aspen and spruce mortality	Analysis of WESBOGY Long Term Study Data and climate data	CFS (Hogg) and WESBOGY (Bokalo, Comeau)	
80.	Effects of aspen density on aspen and spruce wood quality	Could be addressed by collecting supplemental data at WESBOGY LTS, Judy Creek, DADE and other studies	WESBOGY	Proposal under development for supplemental crown and branch measurements on WESBOGY LTS sites.
81.	Economics of mixedwood management options	None		
82.	Economic and yield implications of permanent gaps in forest stands and implications of efforts to regenerate gaps	None		
83.	Understanding of stand dynamics in permafrost areas	None		
84.	Carbon storage and cycling in single species and mixedwood stands.	Claudia Rivera-Rios PhD project underway.	WESBOGY	Field work completed in 2012 at Judy Creek. Data analysis and further sampling underway.
85.	Biodiversity effects of silviculture practices on boreal mixedwood sites.	None. (Identified by Saskatchewan Environment.)		
86.	Effects of stand density and composition on key stem and crown characteristics for aspen and white spruce – links to wood quality	Derek Sattler (PhD) and Phil Comeau FORVALUENET project. Work focussed on Mature Spruce and Mixedwood Stands	U of A	Field work completed, data analysis is underway. 1 paper submitted for publication in CJFR.
87.	Lodgepole pine stand development after attack by mountain pine beetle	Regeneration in a Mountain Pine Beetle Environment	FPPT and fRI	Completed 6 years of measurements. Funding is in place for 2 more.
88.	Effect of density management on lodgepole pine wood quality	Historic Research Trials	FPPT and CFS	On going

	Subject	Project(s)	Group	Status
89.	Impact of temperature change on lodgepole pine regeneration	Regenerated lodgepole pine trial	FPPT (Dempster)	Internal report produced for members in 2015.
90.	Effects of nutrition and density management of lodgepole pine growth	Enhanced Management of Lodgepole Pine	FPPT and UofA	Complete. Plots under protection and could be re-measured.
91.	Site index for advanced growth to include in RSA MAI projections	None		
92.	Technology and how it can be applied in growth and yield--can we do our business better for cheaper? LiDAR, etc.	Bokalo	U of A	On going
93.	Linking RSA and DFMP (Policy)			
94.	Offsetting existing costs for G&Y association costs by enhancing existing studies to get more value			
95.	Climate change impacts around insects and disease; how existing trials can help answer questions about climate.			
96.	Natural disturbances and their impacts			
97.	Post mountain pine beetle response in black spruce and other species.	Stand Dynamics Following Canopy Removal	U of A	Ongoing.
98.	Practices in mixedwoods to mitigate MPB effects			
99.	Other sources of fibre as energy sources			
100.	Landscape level implications of stand-level responses to natural disturbance, treatments, climate change			
101.	Support for PGYI database management	PGYI	PPPT	Ongoing
102.	Land use rationalization for protected areas		Silvacom	Analysis done for some areas.

APPENDIX 2. MEMBERSHIP AND PROJECT TEAM DUES BY ORGANIZATION FOR 2016-2017.

Full Member	Project Dues				Membership Dues	Total
	PPPT	FPT	MPT	WESBOGY		
Alberta-Pacific Forest Industries Inc.	5,000	0	20,000	16,000	500	41,500
Alberta AF	5,000	0	20,000	16,000	500	41,500
Alberta Plywood Ltd.	5,000	0	20,000	16,000	500	41,500
Alberta Newsprint Company	0	18,000	0	0	500	18,500
Blue Ridge Lumber Inc.	5,000	0	0	0	500	5,500
Canadian Forest Products Ltd.	5,000	18,000	0	16,000	500	39,500
Daishowa-Marubeni International Ltd.	5,000	0	20,000	16,000	500	41,500
Edson Forest Products	5,000	0	0	0	500	5,500
Hinton Wood Products	5,000	0	0	0	500	5,500
Louisiana-Pacific Canada, Ltd., Manitoba*	0	0	0	9,983	312	10,295 ¹
Louisiana-Pacific Canada, Ltd., Dawson Creek*	0	0	0	9,982	313	10,295 ¹
Manning Diversified	0	0	0	16,000	500	16,500
Millar Western	5,000	18,000	20,000	0	500	43,500
Saskatchewan ENV	0	0	0	16,000	500	16,500
Spray Lake Sawmills	0	18,000	0	0	1,000	19,000
Sundre Forest Products	5,000	18,000	0	0	500	23,500
Tolko, High Level	5,000	0	20,000	0	500	25,500
Vanderwell	0	0	0	0	5,000	5,000
Weyerhaeuser Company, Alberta Forestlands	5,000	18,000	20,000	16,000	500	59,500
Total Dues	60,000	108,000	140,000	147,965	14,125	470,090

*Shared membership.

¹ WESBOGY Project Team and FGrOW membership dues include dues for the last quarter of 2015-2016, i.e. January 1 to March 30, 2016.

APPENDIX 3. MEMBER CONTACT INFORMATION AND PROJECT TEAM AFFILIATION

The follow list of FGrOW members includes member representative contact information, Project Team Affiliation and FGrOW Role, if any.

M= Main contact and voting member

A=Additional contact that should be included in communications

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
Alberta Agriculture and Forestry	Darren Aitkin darren.aitkin@gov.ab.ca 780-644-5581	FGrOW Executive	M		A	M		M
Alberta Agriculture and Forestry	Lee Charleson lee.charleson@gov.ab.ca 780-656-5052						M	
Alberta Agriculture and Forestry	Rweyongeza Deogratias Deogratias.rweyongeza@gov.ab.ca 780-638-2855						A	
Alberta Agriculture and Forestry	Lee Martens lee.martens@gov.ab.ca 780-644-3851				M			A
Alberta Plywood	Gary Harmata Gary.Harmata@westfraser.com 780-805-3718				A		M	A
Alberta Plywood	Terry Kristoff Terry.Kristoff@westfraser.com 780-804-3715		M		M	M	M	M
ANC	Greg Branton gregb@albertanewsprint.com 780-778-7012						M	
ANC	Ian Daisley iand@albertanewsprint.com 780-778-7000		M	M				

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
ANC	Garry Mitchell garrym@albertanewsprint.com 780-778-7000		A	A			A	
Al-Pac	Roger Butson roger.butson@alpac.ca	-	A		A	M		A
Al-Pac	Dave Cheyne dave.cheyne@alpac.ca 780-525-8261		M		M	A		M
Al-Pac	Kim Rymer kim.rymer@alpac.ca 780-525-8097	-					M	
Blue Ridge Lumber	Shane Sadoway Shane.sadoway@westfraser.com 780-648-6220	FGrOW Executive TIA Project Team Chair	M	M		M		
Blue Ridge Lumber	Colin Scott colin.scott@westfraser.com 780-648-6303			A		A		
Canfor	Dawn Griffin dawn.griffin@canfor.com 250-787-3607							
Canfor	Christine Quinn christine.quinn@canfor.com 780-538-7738		A				M	
Canfor	Melonie Zaichowsky Melonie.Zaichowsky@canfor.com 780-538-7740		M	M		M		M
DMI	Frazer Butt FButt@dmi.ca 780-624-7427		M		M	M	A	M

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
DMI	Peggy Pike ppike@prpddmi.com 780-624-7429						M	
DMI	Gord Whitmore GWhitmore@dmi.ca 780-624-7036		A		A	A		A
Edson Forest Products Hinton Wood Products	Hal Jackson Hal.jackson@westfraser.com 780-865-8986		M	M		M		
Edson Forest Products Hinton Wood Products	Diane Reanud diane.renaud@westfraser.com		A				M	
Edson Forest Products Hinton Wood Products	Byron Vriend byron.vriend@westfraser.com 780-865-8913		M	M		M		
Lousiana Pacific - BC	Paul Hawkins Paul.Hawkins@lpcorp.com 250-782-3302		M					M
Lousiana Pacific - Manitoba	Paul Leblanc Paul.Leblanc@lpcorp.com 204-734-7724		M					M
Manning Forest Products	Steve Blanton Steve.Blanton@mdfp.ca 780-836-5397		M				M	M
Millar Western	Tim McCready tmccready@millarwestern.com 780-778-2221 ext 2207	FGrOW Executive PPPT Chair	M	M	M	M	M	
Millar Western	Dan Philippot dphilippot@millarwestern.com 780-706-5195			A			A	

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
Norbord Inc.	Colleen Braconnier colleen.braconnier@norbord.com 780-831-2507						A	
Norbord Inc.	Fred Radersma fred.radersma@norbord.com 780-831-2516						M	
Northland Forest Products Ltd.	Garry Ehrentraut garry@nfpl.ca 780-417-9646							
Northland Forest Products Ltd.	Dave Harman dave@nfpl.ca 780-743-3773							
Saskatchewan Government	Dave Lindenias Dave.lindenias@gov.sk.ca 306-953-2442		A					A
Saskatchewan Government	Phil Loseth Phil.Loseth@gov.sk.ca 306-953-3567		M					M
Spray Lake Sawmills	Matt Denney Matt.denny@spraylakesawmill.com 403-851-3315	FPPT Chair	M	M				
Sundre Forest Products	Karalee Craig karalee.craig@westfraser.com 403-638-6210		A	A		A	M	
Sundre Forest Products	Bob Held Bob.Held@westfraser.com 403-638-6207	FGrOW Executive	M	M		M		
Sundre Forest Products	Cam Rollins cam.rollins@westfraser.com 403-638-6201			A		A		

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
TIA Board	Daniel Chicoine daniel@iftech.ca 780-437-1847	TIA Project Team Coordinator						
Tolko	Tim Gauthier Tim.Gauthier@tolko.com 780-983-9177		M		M	M		
Tolko	John MacLellan john.maclellan@tolko.com 780-502-0651						M	
Vanderwell	Mike Haire m.haire@vanderwell.com 780-805-3060		M					
WESBOGY	Mike Bokalo Mike.Bokalo@ualberta.ca 780-492-9038	WESBOGY Research Scientist						
WESBOGY	Phil Comeau Phil.Comeau@ualberta.ca 780-492-1879	WESBOGY Chair						
Weyerhaeuser	Greg Behuniak Greg.Behuniak@weyerhaeuser.com 780-539-8207		M	M	A	A		M
Weyerhaeuser	Kerri MacKay Kerri.Mackay2@weyerhaeuser.com 780-621-5537	FGrOW Chair	M	A	M	M		A
Weyerhaeuser	Angela Kuysters angela.kuysters@weyerhaeuser.com 780-832-1956						M	
Weyerhaeuser	Dave Swindlehurst dave.swindlehurst@weyerhaeuser.com 780-542-8074	MWPT Chair	A		M		M	

Associate Members

Organization	Contact	FGrOW Role	FGrOW	FPPT	MPT	PPPT	TIA	WESBOGY
Canadian Wood Fibre Centre	Dan MacIsaac Dan.MacIsaac@NRCan-RNCan.gc.ca 780-435-7332		M					M
Canadian Wood Fibre Centre	Jim Stewart Jim Stewart@NRCan-RNCan.gc.ca 780-435-7224		M	M				
Canadian Wood Fibre Centre	Derek Sidders Derek.Sidders@NRCan-RNCan.gc.ca 780-435-7355		A	A				A
University of Alberta	Vic Lieffers vic.lieffers@ualberta.ca		M					
University of Alberta	Sarah Gooding sarah.gooding@ualberta.ca 780-492-8313		A					
University of Alberta	Barb Thomas bthomas@ualberta.ca 780-492-8016		A					

APPENDIX 4. SUMMARY OF DELIVERABLES AND PROGRESS FOR THE REGENERATED LODGEPOLE PINE TRIAL.

Deliverable	Progress / Next Steps	Reference
Measurement and treatment schedule (annually by June 15)	Completed for 2015. Next schedule June 2016.	RLP measurement schedule (spreadsheet), 2015.
Field measurements	Continue measurements according to the decision made by members based on assessment of 2015 data. Update field manual to reflect changes in growth phase measurements (June 2016).	<i>Foothills Pine Project Team—Regenerated Lodgepole Pine Trial—Assessment of Data Collected in 2015.</i>
Summary status and verification reports (January 31, prior to final payments to sponsors by FRIAA)	Will be distributed annually by January 31.	Individual company audit and work verification reports
Digital database (updated annually, December 31)	Loading database provided to contractors annually by June 30. Field data uploaded to database by December 31. Master database requires loading, clean-up and approval.	RLP Task Force Report, July 10 2009. Latest database version: <i>RLPMaster_20140107</i>
Field treatments	Pre-commercial thinning scheduled for 2012 - 2015 has been completed.	Field manual supplement and schedule (June 2014).
Crop performance report (updated annually, March 31)	Annual updates will be made based on the most recent field measurements.	Regenerated lodgepole pine trial: crop performance update, March 2015.
Regeneration model deployment plan	Last revised March 2015. Revise annually under direction of FRIPSY task force.	FRIPSY Enhancement and Deployment Schedule-Update for 2015, February 2015
Regeneration model: demonstration and distribution	User training and feedback workshop, June 2015	
Regeneration model enhancement	FRIPSY Version #2: enhanced user interface, establishment survey projection and top height projection, 30 June 2014. FRIPSY Version #3 (base model): incorporating other enhancements identified by task force (see text), 30 June 2015. FRIPSY Version 3 batch processor: 31 October 2015. FRIPSY Version 3 final calibration: 31 December 2015	FRIPSY_BP_20140630.xlsm (Excel file). FRIPSY User's Guide Version 2.0 (June 2014). Update on Development of FRIPSY, February 2015 FRIPSY Enhancement and Deployment Schedule – Update for 2015 FRIPSY_BP_20150910.xlsm (Excel file)

Deliverable	Progress / Next Steps	Reference
Assessment of climate effects	Incorporation of climate related variables in the regeneration model is still under investigation. An updated report was prepared in 2015, and is being considered for publication.	<i>Impact of Climate on Juvenile Mortality and Armillaria Root Disease in Lodgepole Pine</i>

APPENDIX 5. FOOTHILLS PINE PROJECT TEAM WORK AND COST ALLOCATION BASED ON PINE-LEADING AREA

Member	Net area (ha)	% of total
Alberta Newsprint Company	106,870	5.2
Blue Ridge Lumber	180,323	8.8
Canadian Forest Products	106,271	5.2
Millar Western Forest Products	112,406	5.5
Spray Lake Sawmills	114,988	5.6
Edson Forest Products	121,848	6.0
Sundre Forest Products	293,655	14.4
Hinton Wood Products	451,713	22.1
Weyerhaeuser Canada	557,433	27.2
Total	2,045,507	100.0