Forest Resource Improvement Association of Alberta
Forest Resource Improvement Program

Foothills Growth and Yield Association
Third Five-Year Program

April 2010 - March 2015

Proposal Prepared by:

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February 3, 2011

P.O. Box 6330
Hinton, Alberta
T7V 1X6

Proposal Summary

Applicant

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Contact Persons:	Tom Archibald, telephone 780 865 8332, fax 780 865 8331
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Sponsors

Company / Division	*Dues Method*	*Contact Person*	*Telephone*
Alberta Newsprint Company	Direct Payment	Greg Branton	(780) 778 7012
Blue Ridge Lumber	FRIP Authorization	Tim Burns	(780) 648 6220
Canfor	Direct Payment	Dwight Weeks	(780) 538 7745
Millar Western Forest Products	Direct Payment	Tim McCready	(780) 778 2221
Spray Lake Sawmills	FRIP Authorization	Ed Kulscar	(403) 932 2234
Sundance Forest Industries	FRIP Authorization	John Huey	(780) 723 3977
Sundre Forest Products	FRIP Authorization	Bob Held	(403) 638 4482
Hinton Wood Products	FRIP Authorization	Richard Briand	(780) 865 8181
Weyerhaeuser Canada	Direct Payment	Greg Behuniak	(780) 539 8207

Project Information

Type: Inventory / Planning/ Research

Term: April 1, 2010 to March 31, 2015.

Amount of funds:

29,878	Balance forward from 2009-10 workplan
129,500	FRIP funds from FOOMOD-01-03 carried forward
450,000	FRIP funds to Applicant for Development and Management
360,000	External funds to Applicant for Development and Management
1,021,900	Funds to Sponsors for Regeneration Project (FRIP eligible)
1,991,278	Total

(Actual amounts requested for Regeneration Project may vary from estimates contained in this Proposal, and will be specified in supplementary funding applications submitted directly by the Sponsors)

Attachments

1. Proposal and Project Schedules
2. Appendix1 – Minutes of FGYA Steering Committee, March 25, 2010
   Appendix 2 - Foothills Growth and Yield Association Committee Membership

Acknowledgement by Applicant

The Applicant (jointly with the Sponsors and severally the "Signatory") acknowledges having read and agreed to the terms and conditions described on the attached schedule to which the Application under the Program is made subject. The Applicant acknowledges and agrees that by its submission of this application it shall be bound by the terms of the Program, FRIAA's policies, procedures, protocols and guidelines. It is also acknowledged and agreed that this application may be accepted by FRIAA on further terms or conditions, which shall be binding on the Signatory once the proposed project is undertaken by the Signatory.

Applicant: _____

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1. Background

In 1999, the Foothills Model Forest (FtMF)[1], responding to interest by industry and government, facilitated collaboration among nine companies holding Forest Management Agreements on the Eastern Slopes to create the Foothills Growth and Yield Association (FGYA) for co-operative forecasting and monitoring of managed stand growth and yield in Lodgepole pine.

The FtMF appointed and provided funding towards a part-time Director in June 1999, with the mandate to develop a growth and yield co-operative. A memorandum of agreement was developed and endorsed by nine companies, the Land and Forest Service (now Alberta Sustainable Resource Development), and the Foothills Model Forest effective April 1, 2000. The nine companies continue as funding and voting members of the FGYA. The Alberta Department of Sustainable Resource Development (ASRD) and the Foothills Research Institute (FRI) participate as non-voting members of the Steering and Technical Committees, with FRI acting as the coordinating agency. The FGYA operates as a program under the Foothills Research Institute and its annual work plan is also submitted to the Board of the FRI for review and approval.

The Foothills Model Forest, acting as applicant on behalf of the nine sponsoring members, submitted a proposal to the Forest Resource Improvement Association of Alberta (FRIAA) in July 2000. A contract was issued (FOOMOD-01-01 – *Foothills Growth and Yield Association*) on July 25, 2000, facilitating use of FRIP (Forest Resource Improvement Program) funds to cover membership costs and project activities. The original contract had an initial term of 2 years, and was amended in September 2001, extending the term to 5 years (April 1, 2000 to March 31, 2005). In 2005 a second 5-year term was approved (April 1, 2005 to March 31, 2010) under FRIAA Project # FOOMOD-01-03.

This Proposal, seeking continuance of the project for a third 5-year period, was directed at the Annual Meeting of FGYA on March 25 2010 *(see Appendix 1, Item 2 (c))*. It will carry the program through the 12-14 year performance survey window of the Alberta Regeneration Standards. It is the continuance of a major project to forecast and monitor development of Lodgepole pine regenerated after harvesting, along with associated cooperative projects. Seven projects to date have been included in the initiative, all of which are now either complete, in various stages of completion or continuing.

Further, they stated their intent as voting members of the FGYA to support the continued development and management of the Association during the period April 1, 2010 to March 31, 2015 by payment of an annual membership fee, consistent with the Business Plan and as provided for in the Memorandum of Agreement among Members; and agreed that the membership fee for the first one-year period (April 1, 2010 – March 31, 2011) should be set at $18,500, or less.

Subsequent to the meeting, the members signed individual authorizations:

- confirming their desire to sponsor the project, and;
- Agreeing that their membership contribution would be paid directly (4 members) to the Foothills Research Institute or through FRIAA authorizations (5 members).

[1] Effective spring 2008, the Foothills Model Forest changed its name to the Foothills Research Institute, in keeping with its new 5-year business strategy and to better represent the nature of the organization's mission.

2. Mission

The interests of the FGYA cooperators are stated in the Memorandum of Agreement as follows:

- The companies that are signatories of the Agreement wish to participate in a cooperative program for the forecasting and validation of managed stand growth and yield, particularly of Lodgepole pine;
- The Alberta government wishes to promote the scientific development and validation of yield forecasts used by tenure holders in the development of forest management plans;
- The Foothills Research Institute (FRI) wishes to promote cooperation and shared responsibility in the improvement of sustainable forest management practices.

The mission and mandate of the FGYA are to continually improve the assessment of Lodgepole pine growth and yield in managed stands by:

- 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 following indicators will measure success in performing the mandate, and may be used as criteria for evaluating and prioritizing project proposals and other FGYA activities:

1. *Forecasts*: stand-level timber yield forecasts are defensible and accepted by the scientific and regulatory communities.
2. *Validation*: recognized scientific, regulatory and certification standards for validation and monitoring of sustainable forest management practices are met.
3. *Knowledge*: managers' knowledge, and their abilities to predict responses to management practices, are improved, facilitating management by objectives rather than by arbitrary prescription.
4. *Awareness*: stakeholders influencing forest management decisions understand the probable effects of management interventions on stand development.
5. *Cost effectiveness*: investments in growth and yield assessment are cost effective, and there is no unnecessary duplication of effort.
6. *Equitable participation*: participants remain committed to the program, and share costs equitably.
7. *Relevance*: work is user-driven, results-focused, and directly applicable to management and crop planning.

3. Strategies

3.1. Project Development

The goals of the FGYA are achieved through a series of projects developed cooperatively by members, in consultation with government agencies and other experts in growth and yield. Projects of the FGYA are designed to forecast and validate yields for treatment regimes and site conditions of interest to all members, in order to provide a credible and reliable basis for supporting and defending timber supply analyses and assumptions. *Yield forecasts* are defined here as quantitative estimates of future stand timber yields, agreed by the scientific and regulatory community as the most probable outcome of the treatment regime being applied to the range of stand and site conditions specified. *Validation* includes the establishment or adoption of well-designed and replicated field trials, and their periodic re-measurement to compare actual results against forecasts.

Quantitatively, the benefit of a project to each member varies, and is determinable only by the individual member. During project definition, members can, and have, set forward those questions, issues and priorities that relate to their particular interests, and can participate actively in design, approval, implementation, and evaluation of the project. By these means, the qualitative value of projects is assured, and the benefits to be achieved through collective effort and pooled resources will far exceed the outcomes of individual efforts in similar endeavours.

The nature of tree growth requires the program to be long-term and ongoing. Continually improved forecasts are being developed of the growth and yield parameters being tested, using the best models and data available when projects are initiated and each time they are re-measured. Amendments to Forest Management Agreements in Alberta continue to emphasize the importance of growth and yield in support of detailed forest management planning.

Detailed methods are specified in project plans and experimental designs. Measured variables include (a) stand and site parameters prior to or at time of treatment, and silvicultural treatment parameters, and / or (b) stand and site parameters at benchmark stand development stages. These variables are intended to include, or be stratified by, a common ecological site classification system. Forecast variables include future stand conditions, and timber yields from intermediate (if applicable) and final harvests, at utilization standards agreed by the members.

Recognized scientific experts in growth and yield, silviculture, biometrics, tree nutrition, and forest ecology are encouraged to review project plans and results, and / or participate in analyses. Meetings will be held at least once a year, to which experts will be invited to attend and participate. Formal peer review will be encouraged through the publication of project results. Use of field trials for demonstration and ancillary research purposes will be promoted.

3.2. Project Priorities

Voting members set the priorities for the program in 2001, and these were further reviewed and updated in 2008. The primary focus to date has been on forecasting the development of post-harvest managed stands, particularly important because of current interests and urgency for the development and refinement of regeneration standards linked to growth and yield. The members also recognize that experimentation and assessment of fire-origin stands continues to be relevant and necessary (a) for yield forecasting and sound silvicultural decision-making in post-harvest stands, and (b) the ability to predict responses to potential interventions such as thinning and fertilization.

To prioritize project selection and development, members were also asked to rate the importance (high, medium, low) of various forest management objectives, with the following results:

1. Timber volume (annual allowable cut) was rated high by all members;
2. Wood value (related to cost of production and / or price of product) was rated high by a majority of members;
3. Ecological (primarily biodiversity and habitat), protection, and risk management objectives were rated medium to high by a majority;
4. A majority rated social objectives (e.g. aesthetics) low.

In 2007 the Association embarked on a new high-priority project entitled “Monitoring and Decision Support for Forest Management in a Mountain Pine Beetle Environment” which was accepted for FRIAA funding, as well as additional funding and in-kind support from FRI. In 2008, the Association again updated its research and development priorities as follows (existing projects noted):

1. Responses to planting, vegetation management and density regulation treatments in harvest-origin stands.
    - Project 2 – Regenerated Lodgepole Pine
2. Mortality, forest health and risk management in regenerated stands following harvest, including the effects of climate change. This includes the impact of Mountain Pine Beetle on forest health and post-beetle regeneration and stand management strategies
    - Project 2 – Evaluation of the impacts of climate variation on regeneration performance
    - Project 7 – Monitoring and decision support, MPB
3. Investigations of spacing, tending, nutrition and thinning in harvest-origin stands including application of results from density and nutrition management trials in fire-origin stands.
    - Project 4 – Historic Research Trials
    - Project 6 – Enhanced Management of Lodgepole Pine (reports pending)
4. Impacts of density management on wood quality over time
    - No project at present, the Association will assist the Canadian Wood Fibre Council of the Canadian Forest Service in assessing the effects of management practices on wood quality.

The above priorities are reflected in the identification and development of the projects described in Section 4.

3.3. Roles, Responsibilities and Assigned Tasks

The FGYA is a not a separate organization under Alberta or federal law, but rather operates as a program of the Foothills Research Institute, with its plans approved by the Board of FRI, as well as voting members of the Association. It is a cooperative initiative involving voting members (industrial sponsors), ASRD and the Foothills Research Institute (as Coordinating Agency).

3.3.1. Voting Members

Voting members must be corporations or corporate divisions holding forest management tenures in Alberta. Responsibilities of the voting members include:

- Installation and measurement of growth and yield trials (either directly or by financial and other support of work undertaken by contractors administered through the FRI) as specified in work and project plans approved by the Steering Committee;
- Provision of error-free data, timely delivered in a format defined by the Coordinating Agency and the Technical Committee, from trials measured under direct supervision of the member;
- Appointment of a representative to the Steering Committee with authority to vote and represent the Member's strategic and financial interests;
- Assignment of a representative to the Technical Committee with authority to represent the Member's technical views and interests;
- Payment of an annual membership fee approved by the Steering Committee to support the direct costs incurred by the Coordinating Agency (FRI) in the management of the Association.

Field trials and associated silvicultural activities are conducted under authority of the sponsors' timber tenures.

Overall control of management of the FGYA is vested in the Board of the Foothills Research Institute, as well as the Steering Committee, which will:

- Meet at least once each year;

- Elect from among the voting members' representatives a chairperson who calls and chairs meetings;
- Define, periodically review, and revise as necessary, a minimum project contribution level for voting members;
- Set, annually review, and revise as necessary, annual membership fees;
- Review and approve project plans, data standards, annual work plans, annual operating budgets, reports, and priorities for supporting research;
- Review and approve contracts for outside services, data sharing agreements, and other business arrangements proposed by the appointed Operations Director;
- Approve assignment to the FGYA of personnel hired or contracted by the Coordinating Agency;
- Approve the publication and dissemination of information resulting from FGYA projects.

The term for the elected chairperson is 2 years.

The Technical Committee, supported by the Research and Development Associate, and Operations Director, will:
- Develop project plans, experimental designs and standards for approval by the Steering Committee;
- Assist the Operations Director in the development of work plans and budgets;
- Coordinate the installation and measurement of field trials;
- Monitor project implementation, quality control, and data delivery, and evaluate results.

See Appendix 2: *Foothills Growth and Yield Association Committee Membership*

3.3.2. Alberta Sustainable Resource Development

The Forestry Division of ASRD has undertaken to:
- Assign the Executive Director of the Forest Management Branch, or other authorized senior official, to participate on the Steering Committee in a non-voting advisory capacity;
- Assign a technical expert, or experts, knowledgeable in forest planning and yield forecasting, to the Technical Committee to provide advice on matters pertaining to project planning, experimental design, quality control, data acquisition, model development and validation, project evaluation, and regulatory requirements for yield forecasting and validation.

3.3.3. Foothills Research Institute

The Foothills Research Institute, as Coordinating Agency for the FGYA, will be responsible for:
- Administration of the Association as a Program of the Foothills Research Institute;
- Approval of annual work plans of the FGYA;
- Appointment of a representative of the Foothills Research Institute Board of Directors to the Steering Committee in a non-voting capacity;
- Dissemination of information to, and continuing education of, FGYA members in matters relevant to the Association;
- Preparation and submission of the reports.

The Foothills Research Institute will also:
- Retain the services of a Operations Director to manage the Association and a Field Coordinator, reporting to the Operations Director, to coordinate and ensure quality control of field services undertaken by contractors;
- Retain or assign other required staff and contract services;

- Administer the annual operating budget of that portion of the Association's program for which it is directly responsible;
- Control expenditures in accordance with the approved operating budget, generally accepted Canadian accounting practices, and FRIAA requirements;
- Maintain books of account of all funds contributed and dispersed on behalf of the Association, in accordance with generally accepted Canadian accounting practices, and subject to annual independent audit;
- Procure and maintain equipment and supplies required by the Association;
- If applicable, procure, own, and maintain equipment requiring capital expenditures, and lease such equipment to the Association at rates not exceeding fair market value;
- Maintain a secure repository of all FGYA data if requested to do so.

3.3.4. Operations Director (Director of Operations and Field Coordinator)

Reporting to the Steering Committee, the Operations Director will be retained on a part time basis to undertake the following duties:

Project 1: Development and Management of the Association:

- Develop and update annually, with technical input from the R&D Associate, the Business Plan and Annual Work Plan, and other plans as required, e.g. five year plans
- Organize annual and interim meetings of the Steering Committee, Technical Committees and other committees as required
- Chair the Technical Committee consisting of representatives from 11 member organizations, and consult with the members regarding the development and management of projects;
- Ensure that project proposals, plans, experimental designs, and data standards are developed in a timely manner;
- Control data quality consistent with plans and standards approved by the Steering Committee;
- Oversee loading (including quality control), compilation and maintenance of FGYA project databases;
- Ensure that projects are implemented in a timely manner consistent with approved program and project plans and quality standards;
- Planning, supervision and quality control of field research and measurements, including the overseeing and auditing of contracts and the coordination of inputs by technical representatives;
- Dissemination to FGYA members of relevant information, including a minimum of one educational meeting or field trip per year;
- Collaboration and cooperation with other agencies as appropriate and necessary to further the interests of the Association.
- Preparation of progress reports every six months or as otherwise requested by the Steering Committee, and of annual program and project reports;

Project 2: Regenerated Lodgepole Pine

- Organize the pre-field season meeting (Late June) with member companies and contractors to review scheduled remeasurements and other issues. The R&D Associate will participate in this meeting to address technical and measurement standard issues.

Project 4: Cooperative Measurement of Historic Research Trials

- Collaborate with SRD and the CFS in planning historic research trials measures and maintenance including signage

- Organize and supervise measurements of HRT plots

Project 7 – Regeneration Management in a Mountain Pine Beetle Environment

- Provide input to the project as required and serve as FGYA representative on the Activity Team of the Foothills Research Institute's Mountain Pine Beetle Ecology Program

Extension and Communications

- Cooperate with the R&D Associate to prepare Quicknotes or other bulletins providing non-technical summaries of project results and/ or program activities (e.g. Regenerated Lodgepole Pine, Mountain Pine Beetle)
- With input from R&D Associate, provide updates to Research Institute Board and invited attendees at the Annual General Meeting, and at Workplan review.
- With assistance from the R&D Associate, provide input to the Foothills Research Institute in maintenance of the FGYA section of the FRI website.

3.3.5. Research and Development Associate (Technical Director)

A Research and Development Associate will be retained on a part-time basis to provide analytical and technical direction services to the members and the Operations Director. He/she will hold an advanced forestry degree with extensive research and operational experience in growth and yield, and will undertake the following duties:

- Selection and development of analytical and modeling techniques for predicting the establishment, performance, growth and yield of Lodgepole pine in managed stands;
- Selection or development (as appropriate), testing, and validation of stand-level growth and yield models which best represent the experimental sites, practices and data evaluated;
- Analysis of data from FGYA field trials;
- Reporting of technical results of projects to FGYA members;
- Evaluating and, if appropriate, recommending continued support for research projects and trials a minimum of two years prior to any planned termination of support or maintenance;
- Development and testing of decision-support tools for application by Association members;
- Preparation of technical reports and papers for dissemination or publication;
- Liaison and communication with Association timber supply planners and silvicultural practitioners, and with researchers in collaborating agencies, as required for effective exchange of knowledge and ideas
- Technical input to various plans and reports of the FGYA.

The required level of input is expected to be approximately 80 days per year. The Associate will report to the Operations Director on program responsibilities and administration and directly to the Steering and Technical Committees on technical results and products.

3.3.6. Field Services Contractors

Planned project implementation will require the services of qualified and FGYA member-endorsed contractors with proven experience in forestry field measurements, sample plot layout, and / or experimental silviculture. Selection for projects will be competitively bid, or may be sole-sourced in situations where only one contractor is available with the required skills and experience. In the latter case, financial proposals will be evaluated by at least 2 technical representatives in addition to the Operations Director.

Member companies of the FGYA will undertake – using their own crews or field contractors of their choice - the remeasurement of the Regenerated Lodgepole pine plots, and submit the data to the Association for analysis.

If the Field Coordinator is a member of a consulting firm providing technical services to the FGYA either directly or through a member company, he must separate himself from direct involvement in field service provision whether through direct measurements or supervision of field crews doing the work.

3.4. Allocation of Effort and Costs

Each voting member pays an equal annual membership fee. The total amount levied will be sufficient to cover costs incurred by the Coordinating Agency in carrying out its responsibilities as defined in Section 3.3.3 above. The annual fees are projected in Table 2, but will be subject to Steering Committee review and approval each year.

Unless otherwise provided for under special agreements with external sponsors and cooperators, the costs or direct effort for installing, maintaining, treating and measuring field trials will be shared among voting members. Costs and effort will be allocated according to the net operable pine-leading land area in the members' tenures. Where the member shares annual allowable cut (AAC) for a management unit, the contributing land base for that unit will be calculated as the total AAC land base multiplied by the member's portion of the AAC. Table 1 shows areas and percentage allocations as calculated in 2002. The allocation will be updated when significant changes occur to any member's net area. The re-allocation will take effect in the fiscal year following the change being reported, and will not be applied retroactively.

Situations have arisen where members have already collected growth data from permanent sample plots (PSPs), potentially contributing to an FGYA project with considerable timesaving. Such contributions may be recognized and encouraged by crediting and offsetting the value of the data against the contribution that the member would otherwise make to the project under the allocation formula. The Technical Committee will assess the value of such contributions relative to the cost of new data collection, and make recommendations to the Steering Committee regarding what value should be credited to the member contributing data. The Steering Committee will make the final determination of the value to be credited. The FGYA will not normally reimburse the member directly, or allow credits to be accumulated from one project to another, so the maximum value that can be recognized is the project cost that would otherwise be allocated to the member for collecting new data. In the event that such an offset is made, the cost of new data collection will be shared among the other members, in proportion to their net areas.

Table 1. 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
Sundance Forest Products	121,848	6.0
Sundre Forest Products	293,655	14.4
Hinton Wood Products	451,713	22.1
Weyerhaeuser Canada	557,433	27.3
Total	2,045,507	100.0

3.5. Collaboration with External Institutions

Cooperation with external agencies (i.e. non-FGYA members) is desirable and necessary for meeting the mandate and mission of the FGYA. Such collaboration strategy must be deemed beneficial to the Association and its members, equitable, and an efficient expenditure of the Association's time and resources.

The FGYA may collaborate with other agencies in order to:

- Obtain expert advice on the design, analysis and interpretation of projects;
- Obtain assistance in the analysis of data and publication of results;
- Encourage independently funded supplementary research supporting and building on FGYA projects;
- Access relevant information sources, including through sharing and exchange of data where clearly in the FGYA's interest and approved by the Steering Committee;
- Improve communication between researchers and practitioners where such communication will benefit members and enhance the assessment of Lodgepole pine growth and yield in managed stands.

Where collaboration involves data sharing, significant costs, publication of FGYA information, and / or formal commitment to deliverables, the Operations Director will obtain the approval of the Steering Committee before proceeding. If deemed necessary and appropriate by the Steering Committee, the FGYA will enter into a formal memorandum of cooperation and / or collaborative research signed by the FGYA's chairperson. Such an agreement between the FGYA and cooperator will specify:

- Purpose and scope of the cooperation;
- Administrative roles and responsibilities;
- Contributions (financial and / or in-kind);
- Data ownership and access;
- Appropriate provisions and clarifications regarding liability, indemnification, amendment, notice, and dispute settlement;
- Term of agreement and time schedule for work commencement and completion;
- Schedule of committed deliverables.

No provisions in any such agreement may conflict with, encumber or supersede provisions contained in the Memorandum of Agreement between FGYA members or the Business Plan.

In 2002, the FGYA, the Northern Forestry Centre of the CFS, and the Land and Forest Division of Alberta Sustainable Resource Development signed an agreement for the cooperative management of historic Lodgepole pine research trials. This agreement was renewed in 2008 through to March 31, 2013, to facilitate collaboration and continuing access to and use of historic trials for the purpose of improving knowledge of growth, yield, silviculture and fibre qualities. In 2009, the Canadian Wood Fibre Centre of the CFS committed $50,000 to the FGYA Historic Research Trials project, to support the work of the FGYA and undertake additional measures and analysis of historic CFS plots. A revision to this Agreement in 2010 increased the contribution to $90,000.

University of Alberta: On April 1, 2005 the University and FGYA entered into a collaborative agreement to participate in implementation of the *Enhanced Management of Lodgepole Pine* Project; this Agreement was updated in 2008, and extended until March 31, 2010. The FGYA is also working informally with U of A researcher Dr. A. Hamann to produce a joint paper on climate effects on mortality in juvenile lodgepole pine.

Other growth and yield associations:
No other formal agreements are currently planned, beyond the partnership between the FGYA member organizations (including FRI and SRD), and with the CFS. However, the FGYA will continue to foster dialogue, information exchange and cooperation with other research institutions sharing common goals and interests. We are particularly desirous to encourage and cooperate with other growth and yield associations in (a) regeneration modeling of species mixtures, (b) impacts of climate change on juvenile stand performance and (c) information sharing on silvicultural risk management.

3.6. Data Sharing
New data collected and / or funded by a member specifically as part of an approved cooperative project will be provided to the FGYA and made available to all Association members. The Association's use of the data will be limited to that specified in project and work plans approved by the Steering Committee (unless otherwise directed by the Steering Committee). Digital files and data bases funded through FRIAA may be subject to access through provincial freedom of information legislation. Otherwise data will not be distributed outside the FGYA without the agreement of the contributing member or members. Section 8 of the Memorandum of Agreement among members imposes restrictions on the use of cooperative project data by individual members, including that no member shall disseminate data collected by other members, or information derived from such data, to non-members without the approval of the Steering Committee. Dissemination of information within a member's organization, including other divisions and the parent corporation, is permitted.

If individual members or external agencies contribute data not collected directly as part of a cooperative project, such data will not be released to third parties, including individual members of the Association, without the agreement of the owner. Such data would not be accessible through provincial freedom of information legislation unless directly funded through FRIAA. Analytical results, including crop performance reports and yield forecasts, will be shared among members. The data and results obtained will not be further distributed or published without the approval of the Steering Committee. This consent will not be unreasonably withheld. Reports and scientific manuscripts for projects funded through FRIAA will be accessible to the public following appropriate review by FGYA members.

3.7. Justifications for External Funding

Some members elect to sponsor their contributions to the FGYA from FRIP (Forest Resource Improvement Program). Such Authorizations are made annually, with the funding advanced as required in current or ensuing years, based on the approved Work Plan. The FGYA's program fulfils the proposal evaluation criteria of FRIAA, and is not a regulatory responsibility of the industrial members. Funding or collaboration will also be sought from other sources, given the program's:

- Alignment with provincial forest management and research priorities;
- Alignment with federal and provincial priorities for science and technology transfer and sustainable forest management;
- Opportunities for research and demonstration provided by field trials.

Justifications and qualifications for funding through FRIAA and other sources are summarized as follows.

3.7.1. Application of Results

The FGYA's activities are enhancing the management of forest resources by providing a continually improved, scientific, quantitative, and credible basis for:

- Linking regeneration standards and practices to timber yield objectives;
- Evaluating and selecting silvicultural regimes and crop plans to enhance management of Lodgepole pine or other species;
- Evaluating the impacts of climate change on growth and mortality of juvenile Lodgepole pine;
- Forecasting the sustainable supply of timber from forest tenures containing Lodgepole pine, and validating estimates of allowable cut;
- Improving the sustained yield of these forests through enhanced forest management; and
- Providing decision-support tools for the management of stands attacked by mountain pine beetle.

Results apply directly to over two million hectares of tenured and operable pine stands with a current allowable cut of about 5 million cubic metres per year, within the forest tenures of the nine member companies of the FGYA. Information gathered is being used to assess, develop, and approve strategies for enhanced and sustainable forest management within these forest tenures. It is being or will be incorporated into regeneration standards, silvicultural prescriptions, crop plans, managed stand yield tables, and forest management plans. Because trials are stratified on an ecosystem basis, rather than just by tenure, the results are generally applicable to the natural range of Lodgepole pine in Alberta.

The FGYA is enhancing the integrated and sustainable management of forest ecosystems through:

- Improved assessment of ecosystem productive capacity;
- Improved assessment capability of the sustainable use levels of a biological resource;
- Promotion of cooperation, partnership, and shared responsibility among forest managers and researchers;
- Increased levels of knowledge and awareness of sustainable forest management;
- Continual improvement of sustainable forest management practices including the impacts of alternative silviculture practices on growth and yield and allowable annual cuts;
- Stand-level data providing the basis for assessing impacts of enhanced forest management practices on biological diversity, natural ecosystem processes, fire spread, and contributions to global ecological cycles;
- Examination of the impacts of climate on juvenile Lodgepole pine and resulting mortality from such agents as increased pathogen activity or drought, as well as potential positive impacts through improved growth performance of surviving trees;

- Development of decision support tools to mitigate the impacts of mountain pine beetle on sustainable timber supplies;
- Bridging basic research to market-driven applications such as prototype forestry practices and decision-support tools, demonstration, and feasibility investigation.

3.7.2. Relationship to Existing Responsibilities

The work undertaken by the FGYA pertains to the voluntary enhancement of forest management information and practices, and is not the responsibility of the industrial sponsors under any legislation, regulation, tenure, policy or specific agreement. The program will assist the Government of Alberta in meeting its responsibilities for sustainable resource management, by providing improved assessment of forest growth and yield through the development of scientifically rigorous data and third-party evaluations.

3.7.3. Standards

Standards of experimentation will meet those accepted by the scientific community for biometric research. This is being achieved by third-party participation in project planning, and / or review of experimental designs by recognized experts at the Canadian Forest Service, University of Alberta, or other recognized centres of excellence. Measurement standards will follow or exceed those used by the Canadian Forest Service (CFS) and ASRD for assessing stand dynamics. Standards for forest site classification and evaluation are based on the latest published and government-approved field guides for west central and southwestern Alberta. High standards of analysis will be ensured by use of qualified personnel, extensive networking with growth and yield analysts and modelers, and peer review of results.

The FGYA's activities will not have any adverse impacts on any other forest resource values or users.

3.7.4. Fair Market Value

Work will be undertaken using a combination of contractors and employees of the Foothills Research Institute and sponsors. General benchmarks, used to ensure that fair market value is obtained for planned expenditures, will include:

- Operations Director and Research & Development Associate: Prevailing consulting or salary rates for senior registered professional foresters with formal post graduate qualifications in forest science and twenty or more years of relevant experience.
- Field co-ordination and quality control: Prevailing contract rates for a registered professional forester or technologist with a minimum of five years' experience in forest field measurements.
- Other contractors and field personnel: Prevailing contract or wage rates based on the respective categories of work. Work will normally be competitively bid. Where competitive bidding is not practical (e.g. because of specialized requirements for uniquely held skills), assignments may be sole sourced. Proposals for services to be sole sourced will be scrutinized by at least 2 FGYA member organizations, in addition to the Director, for fair value.

4. Projects and Deliverables

The activities of the FGYA during the term of this Plan will include the following projects:

1. Development and management of the Association;
2. Lodgepole pine regeneration;
3. Comparison of pre- and post-harvest development of Lodgepole pine;

4. Cooperative management of historic research trials;
5. Yield estimators;
6. Enhanced management of Lodgepole pine;
7. Regeneration management in a MPB environment.

Justification, purpose, methods, deliverables, required levels of effort and cost for active projects are addressed below.

4.1. Development and Management of the Association

4.1.1. Justification and Purpose

The Memorandum of Agreement among members of the FGYA requires a Coordinating Agency to administer the Association and a Director (Operations Director) to plan, develop and manage the Association's program, as directed by the Steering Committee and with the assistance of the Technical Committee. Development and management of the Association is aimed at meeting the shared research needs of members co-operatively and cost-effectively.

4.1.2. Methodology

Section 3.3 describes the methodology adopted for developing and managing the Association, including the assigned roles, responsibilities and tasks. During the next 5 years we will expand our extension and dialogue efforts, placing more emphasis on providing decision support for risk and change management, and encourage more user review and feedback from application of our products.

4.1.3. Deliverables

- Annually updated 5-year business plan and annual work plan, with budgets by year for each project;
- Project proposals, plans, designs, reports and publications;
- Information exchange meetings, field tours and technical sessions (minimum of 1 meeting per year), cooperative arrangements with collaborating agencies;
- Active publicly-accessible web site;
- A web-based risk management discussion forum (or fora) to develop awareness, knowledge and consensus for addressing silvicultural threats, primarily mountain pine beetle and other climate-related trends resulting in increased mortality of lodgepole pine;
- Structured deployment and review of decision support tools;
- Annual update and implementation of a Communications and Extension Strategy
- Mid-year and annual progress reports;
- Financial statements (annually and / or as required);
- Documented recommendations of the technical committee;
- Steering committee meeting minutes.

4.1.4. Finance

The development and management of the Association, including direction, field coordination and research and development tasks will be funded centrally and supported through a membership fee approved each year by the Steering Committee. FRIP funding for membership fees was approved by FRIAA for the periods April 1, 2000 to March 31, 2005 (FRIAA Project FOOMOD-01-01) and April 1, 2005 to March 31, 2010 (Project FOOMOD-01-03).

Table 2 shows financial projections for 5 years from April 1, 2010. It does not include the following contributions by members and collaborating agencies:

- FRI administrative and financial services;
- Participation on technical, steering and project committees;
- Attendance of meetings;
- Review of minutes, reports, proposals, experimental designs and scientific papers;
- Identification of candidate sampling and experimental sites;
- Contribution of existing information and data;
- Measurement and reporting of installations in Project 2 - Regenerated Lodgepole Pine;
- Provision and support of existing models;
- Protection of research installations;
- Analysis and interpretation of data.

4.2. Regenerated Lodgepole Pine

4.2.1. Justification and Purpose

The long-term purpose of the Project is to forecast and monitor the growth and yield of Lodgepole pine, regenerated after harvesting, in relation to site, initial spacing of planted stock, natural ingress and mortality, competing vegetation (brush), and density regulation (pre-commercial thinning). These effects and factors were considered by all members of the Association to be the highest priority for project development, given their implications for silvicultural prescriptions, crop planning, regeneration standards, and allowable cut, and the lack of controlled data currently available for assessing alternative practices.

In the shorter-term (i.e. during the first 15 years of the Project) the main focus has been, and will continue to be for the next 5 years, monitoring regeneration establishment and performance, and consolidating the results of monitoring into predictive regeneration models.

Since the Project's inception, the linking of early crop condition and treatment to subsequent growth and yield has assumed a high priority among FGYA members who are seeking to develop stratum-specific reforestation standards based on the yield objectives contained in their forest management plans. This requires linking crop performance (e.g. as measured in 8-14 year performance surveys) to growth and yield predictions, and forecasting crop performance from site and treatment variables and from early crop attributes (e.g. as measured by 4-8 year establishment surveys). Development of beta versions of regenerated lodgepole pine establishment models, as well as a nine year Crop Performance Report in the second five-year phase of the Program have been major steps forward in meeting this goal. The project is entering a critical period over the next 5 years, during which the RLP trials will reach the 12-14 year performance survey window, and it will contribute substantially to meeting these requirements through the further development of these regeneration models. These decision support tools allow managers to predict establishment and performance results based on site, stand, site preparation, planting, and vegetation management factors.

Table 2. Financial Projections for Project 1 - Development and Management of the Association

Income / Expenditure	2010-11	2011-12	2012-13	2013-14	2015-16	5 yr Totals
Annual Member Contribution	18,000	18,000	18,000	18,000	18,000	
Income						
Prior year balance forward	29,878	119,628	93,778	66,978	33,178	29,878[2]
FRIP (FRIAA contract) carry over from FOOMOD -01- 03	116,550	12,950	0	0		129,500
Membership Fees – FRIAA New 5 yr	90,000	90,000	90,000	90,000	90,000	450,000
Membership fees - non-FRIP[3]	72,000	72,000	72,000	72,000	72,000	360,000
Available Funds by Year	308,428	294,578	255,778	228,978	195,178	969,378
Expenditures						
Director	30,000	35,000[4]	30,000	30,000	30,000	155,000
Field Coordinator	40,000	40,000	40,000	40,000	40,000	200,000
Research & Development Associate	75,000	75,000	75,000	75,000	75,000	375,000
GIS, Database and misc. services	30,000	30,000	30,000	30,000	30,000	150,000
Office and field supplies	2,500	2,500	2,500	2,500	2,500	12,500
Meetings and tours	2,000	9,000[5]	2,000	9,000	2,000	24,000
Contingency (<5%)	9,300	9,300	9,300	9,300	9,300	46,500
Expenditures by Year	188,800	200,800	188,800	195,800	188,800	963,000
Ending Balance	119,628	93,778	66,978	33,178	6,378	6,378

4.2.2. Methodology

The Project consists of a long-term field trial, established in 2000 and 2001, and interim forecasting of effects using available models and data. The trial is a three-level split-plot design. The basic balanced design consisted of 90 field installations (5 ecosites x 6 spacings x 3 replications), with each installation split 2 ways into 4 treatment plots (weeding, thinning, weeding and thinning, no weeding or thinning). Twelve additional installations (6 spacings x 2 replications) were added in the modal ecosite category, to produce a total of 102 installations (408 plots). Details of the design, installations and procedures are provided in an *Establishment Report* (April 2003) and a periodically updated field manual .

During the next 5 years we will:

[2] Carry forward is net at beginning of five year period.
[3] Direct Billing to ANC, Millar Western, Weyerhaeuser and Canfor.
[4] Transition year to new Director
[5] Assumes a field trip every second year

- Continue monitoring the trial using the same measurement methodology as in the previous 5 years, and reporting results;
- Conduct scheduled thinning treatments (subject to considerations described below);
- Deploy, enhance and expand the lodgepole pine regeneration model and associated decision-support tools.

Note that installation status and measurements are the responsibilities of individual members, whereas other deliverables are the responsibility of the FGYA. Consistent with the Memorandum of Agreement, the project database was managed by the FtMF until 2007, when a member company assumed responsibility for database design, improvement and management on a temporary basis for 2007 and 2008. Since then, the database cleanup and management has been managed under contract, and this is expected to continue.

Annual status (mortality) checks and bi-annual full measurements will be continued for the next 5 growing seasons, subject to annual re-assessment of their importance. See Table 3 - *Delivery Schedule for the Regenerated Lodgepole Pine Project* and Table 4 – *Regenerated Lodgepole Pine Project – Elapsed Growing Seasons and Scheduled Measurement Type by Year and FMA,* which shows a breakdown of scheduled measurements for the 102 installations by year, number of growing seasons elapsed since planting, and forest management area (FMA). A more detailed schedule will be developed each year before commencement of fieldwork, and reviewed with technical representatives and contractors at a pre-season meeting. The methodology for plot maintenance and measurement are described in the project field manual, Version 3.1 (July 2010).

Crop performance will be reported annually, provided field measures are completed as scheduled. The crop performance update reports will include the latest growth, ingress, competition and mortality statistics summarized by ecosite, treatment, FMA and growing season.

The project design calls for pre-commercial thinning of the designated treatment plots where natural regeneration has exceed target densities. While it is desirable to thin before significant crown-competition occurs, this operation should not be undertaken until ingress of natural regeneration is complete or at least declining, and irregular mortality has stabilized. On many installations mortality of planted stock shows no sign of declining, and trends of mortality in natural regeneration have not yet been confirmed. The experimental design, whilst suitable for assessing growth responses to thinning, may not be so suitable for monitoring responses of pathogens and pathogen-related mortality. This is because, while buffering between plots is adequate for growth responses related to availability of light and nutrients, the distances between measurement plots may not be sufficient to buffer spill-over of pathogen responses. It is therefore proposed to schedule the main thinning treatment for 2013, subject to assessments of mortality, health, ingress and growth in 2010 and 2012. If concerns about suitability of the experimental design remain unresolved, and / or if costs are prohibitive, consideration will be given to applying the treatment to only a sub-sample of the currently scheduled plots. The main treatment could be usefully preceded by a smaller pilot thinning on a few of the most advanced plots in 2011 or 2012, which would allow fine-tuning of the prescription and budget.

Data from the RLP trial were incorporated into a preliminary regeneration model during the second 5 year term of the project. The model is intended to provide silviculturists with forecasts of variables and performance criteria recognized in regeneration surveys and standards, and forest planners with predictions that can be used as inputs to models forecasting growth and yield at later stages of stand development. The modeling technique involves the development of three main types of statistical

models and functions (height and diameter distributions, mortality and ingress), which are used in conjunction with a number of auxiliary models and derived variables to simulate trends observed in the RLP trial and other studies.

Details of steps for further development of the model are described in the *Lodgepole Pine Regeneration Model Deployment and Enhancement Plan* (September 2010). The following sequence of steps will be followed and have been initiated:

1. Preliminary demonstration and deployment. Completion date: June 17, 2010.
2. First round enhancement – model consolidation and discussion group formation. Completion date: October 31, 2010.
3. Second round enhancement – incorporation of 2010 data and feedback. Completion date: March 31, 2011.
4. Third round enhancement – incorporation of 2011 data and feedback. Completion date: March 31, 2012.

After step 4, annual updates and enhancements will continue to be released by March 31 in 2013, 2014 and 2015. By the end of this period, data will have been obtained and analysed from all RLP installations to stand age 14, and a plan developed for on-going monitoring and projection.

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, during 2007 exploratory analyses were conducted 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). Findings were presented to the FGYA in June, 2010, will be summarized in a joint scientific paper by W. R. Dempster (FGYA) and Andreas Hamann of the University of Alberta, and will be supplemented by further analyses of the RLP trial and other data collected over the next five years. Results will be incorporated into the regeneration model, and also will be used to map health and mortality risks throughout the foothills region.

4.2.3. Deliverables

Table 3 lists deliverables for Project 2. Table 4 shows the number of trial installations to be measured, the type of measurement, and stand ages, by year and forest management area.

Table 3. Delivery Schedule for Regenerated Lodgepole Pine Project – 2010-2015

Deliverable	Progress / Next Steps	Reference
Measurement and treatment schedule (annually by June 15)	Completed for 2010.	RLP measurement schedule (spreadsheet), June 2010.
Field measurements Status checks – annual Full measurements – bi-annual (data submission by October 31)	Continue full measurements bi-annually, and annual status checks if possible.	Field Manual for Measurements and Maintenance Version 3.1, July, 2010
Summary status and verification reports (January 31, prior to final payments to sponsors by FRIAA)	Will be distributed annually.	Audit and work verification reports, December 2009.
Digital database (updated annually, December 31)	Digital database has been cleaned and stabilized. FGYA will pursue long-term database management contract for 2010-2015.	RLP Task Force Report, July 10 2009
Field treatments	Pre-commercial thinning tentatively scheduled for 2013 (see Section 4.2.2).	Information Note: Regenerated Lodgepole Pine Trial – Proposal and Priorities for Measurement and Treatment, March 2009
Crop performance report (updated annually, March 31)	Annual updates will be made based on the most recent field measurements. E.g. update March 31, 2011 will be based on measurements made in 2010 field season.	Regenerated Lodgepole Pine Trial 2009 crop performance report, March 1, 2010
Regeneration model deployment plan	Finalized September 28, 2010.	Lodgepole Pine Regeneration Model Deployment and Enhancement Plan, September 2010
Regeneration model: preliminary demonstration and distribution	Workshop June 17, 2010.	Technical Report: Predicting Regeneration Establishment and Performance of Lodgepole Pine in Alberta, May 25, 2010
Regeneration model enhancement	First enhancement - October 31, 2010 Second enhancement - March 31, 2011 Third enhancement - March 31, 2012 Ongoing updates - 2013, 2014, 2015	Lodgepole Pine Regeneration Model Deployment and Enhancement Plan, September 2010
Regenerated lodgepole pine discussion group	Formation by October 31, 2010	Lodgepole Pine Regeneration Model Deployment and Enhancement Plan, September 2010
Assessment of climate effects	Presentation of results – June 2010. Incorporation of mortality effects in regeneration model – June 2010 and ongoing. Scientific paper – March 31, 2011. Risk map / other tools – March 31, 2012 and ongoing.	Effect of Climate on Mortality of Immature Lodgepole Pine – PowerPoint Presentation, June 17, 2010.

Table 4. Regenerated Lodgepole Pine Project – Elapsed Growing Seasons and Scheduled Measurement Type by Year and FMA

FMA	# of installations	Year Measured/ Age/ Type of Measure				
		2010	2011	2012	2013	2014
ANC Timber	6	9(FM)	10(SC)	11(FM)	12(SC)	13(FM)
Blue Ridge Lumber	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Canfor	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Hinton Wood Products	12	10 (SC)	11(FM)	12(SC)	13(FM)	14(SC)
	10	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Millar Western	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Spray Lakes	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Sundance	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Sundre	14	10 (SC)	11(FM)	12(SC)	13(FM)	14(SC)
Weyerhaeuser D.V.	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Weyerhaeuser Edson	6	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Weyerhaeuser G.P.	2	10 (SC)	11(FM)	12(SC)	13(FM)	14(SC)
	16	9 (FM)	10(SC)	11(FM)	12(SC)	13(FM)
Total Full Measurements		74	28	74	28	74
Total Status Checks		28	74	28	74	28
Total	102	102	102	102	102	102

FM = full measurement, SC = status check

4.2.4. Finance

Costs of fieldwork are incurred directly by each member for those installations (clusters of experimental plots) located on their forest management area. Work is administered directly by the member, with the FGYA playing a coordination and quality control role. FRIP funding for continuation of the Project was approved by FRIAA for the period April 1, 2005 to March 31, 2010 (FRIAA Project FOOMOD-01-03), subsequently amended (May 20, 2009) to a August 31, 2011. This new five year proposal covers the period April 1, 2010 to March 31, 2015.

Members wishing to use FRIP funds to cover their inputs 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 5 for Project 2 are approximate expectations based on the work schedule shown in Table 4, and should be regarded as only indicative orders-of-magnitude of the actual costs to be incurred by members. Assumed measurement costs per installation (cluster of 4 plots) are assumed at $3000 and $600 for full measurements and status checks respectively. Costs for continued tending are not specifically included, but may be covered by the assumed contingency allowance.

Table 5. Estimate of Plot Measurement Costs[6] to be Incurred by Members for the *Regenerated Lodgepole Pine* Project: 2010-2015

Cost item	Five year Totals	Estimated Cost
Status checks	232	139,200
Full measurements	278	834,000
Total measurements	510	973,200
Contingency 5%		48,700
Total		**1,021,900**

4.3. Comparison of Pre-harvest and Post-harvest Stand Development

4.3.1. Justification and Purpose

The FGYA completed a comparison of pre-harvest and post-harvest site indices, and in 2004 these results were presented at a major international forestry conference and published in the conference proceedings.[7] The specific purpose of the comparison was to provide credible and reliable forecasts of post-harvest site index, for the main site types of interest to members, relative to pre-harvest values. The study demonstrated that regeneration practices following harvesting are capable of increasing site index and fibre production relative to those of fire-origin stands, most likely because of differences in initial stand densities.

Although the original objectives of the project have been met, and no further funding is requested at this time, the FGYA is desirous to:

- Validate the initial study conclusion, which were based primarily on contemporaneous comparisons between fire and harvest-origin stands, with time-series data from spacing trials;
- Provide further quantification of the effects of stand density on yield.

4.3.2. Methodology

In 2008 a preliminary investigation was conducted using the latest data from the Gregg spacing trials to assess the impact of spacing on stand height development. This will be expanded in 2010 to assess the impact on other stand variables, including volume yields.

4.3.3. Deliverables

Report: Verification of Project 3 conclusions and quantification of effects of density on yield - March 31, 2011 (see Project 4 deliverables in Table 7).

4.3.4. Finance

No further costs are anticipated.

[6] Estimated cost per plot – full measures $3,000; status checks $600

[7] Dempster, W.R. and Huang, Shongming. Enhanced Fibre Production and Management of Lodgepole Pine. CIF/SAF Joint 2004 annual general meeting and convention., October 2-6, Edmonton, Alberta, Canada

4.4. Cooperative Management of Historic Research Trials

4.4.1. Justification and Purpose

In August 2001, representatives of the FGYA, the CFS, and ASRD (Alberta Sustainable Resource Development) visited historic CFS Lodgepole pine trials. They concluded that these trials were invaluable resources for forecasting, monitoring and demonstrating the effects of nutrition and density management, and that links should be forged to ensure their ongoing protection, measurement and interpretation. In 2002 the Director General of the Northern Forestry Centre, the Executive Director of the ASRD Forest Management Branch, and the Chairman of the FGYA, signed a Letter of Agreement facilitating the collaborative arrangements necessary to provide forest managers in Alberta with the full and continued benefit of relevant long-term field trials established to assess the responses of Lodgepole pine to nutrition and density management.

The initial term of the Agreement was from July 1, 2002 – June 30, 2007, and a five-year renewal was proposed in 2007. By then, responsibility for these trials had passed from the CFS' Northern Forestry Centre to the Canadian Wood Fibre Centre (CWFC) of the CFS and its representatives requested changes in the Agreement to reflect their interests in the trials. An interim renewal was signed to April 30, 2008 while a new five year renewal was negotiated. This is now complete and it runs through to March 31, 2013 to facilitate working arrangements for collaboration and continuing access to and use of historic trials for the purpose of improving knowledge of growth, yield, silviculture and fibre qualities.

The historic trials are and will remain integral to the work of the CWFC, particularly with the establishment of the "Managing for Value in Lodgepole Pine" project. The historic trials provided most of the data for current model development and validation underway. As part of this work, there are a number of papers at various stages in the pipeline concerning e.g., LiDAR-enhanced inventory, including predicting diameter from height, predicting wood quality and fibre attributes from tree and stand data, effects of CT and PCT on volume increment, piece size and wood quality.

In 2009, the CWFC approved a $50,000 grant (increased to $90,000 in 2010), extended over two years, to support and expand the work of the FGYA on historic research trials as well as that of the CFS on wood fibre quality anlaysis. This Agreement includes funding for measurements of the Clearwater plots as well as some that would not normally be scheduled based in current priority listings. These include: Gregg 84 (low & high sites), McCardell, Teepee Pole, Clearwater, Ricinus and Strachan Plots.

4.4.2. Methodology

The Project involves 3 main tasks:

1. Maintenance and protection of the field installations;
2. Analysis of historic data and synthesis of results;
3. Ongoing measurement.

This is a cooperative effort shared between the FGYA, CFS (Canadian Wood Fibre Centre) and ASRD. Details of proposed objectives, data sharing arrangements, activities, level of effort, and contributions are contained in the Letter of Agreement. The FGYA's main roles are re-measurement and maintenance of the trials on a prioritized schedule agreed by the 3 parties, as well as analysis and interpretation of the results. Methods, schedules and sponsorship for this component of the project are specified in the approved FRIAA proposal: *Measurement and Maintenance of Historic Research Trials* (April 2003, FRIAA Project # FOOMOD-01-02). The original agreement approved by FRIAA specified FRIP payments for the first year (2003), but provided for multi-year extensions upon receipt and approval of amended work plans, budgets, reporting and payment schedules. The funding of measurements is subject to annual

review of priorities by all 3 parties (FGYA, ASRD and the CFS), approval each year by the FGYA Steering Committee, and acceptance by FRIAA. For example, in 2011 it is proposed to expand the conventional re-measurement scheduled for the Gregg trial to include a stocking assessment and additional site index measurements, to allow for testing of the spatial version of the GYPSY growth and yield model (see Section 4.5).

Table 6 shows a measurement schedule for the 5-year period 2010 – 2014. The trials indicated for measurement from 2010 onwards have been scheduled based on a priority assessment of plots, and discussion surrounding the renewal of the Letter of Agreement (FGYA, CFS, SRD). Plots shown as "low" priority will not be scheduled for remeasurement except under extraordinary circumstances, e.g. change in risk status or extraordinary funding. Table 6a shows FGYA measurements on the plots during the period 2003-2009.

Methodologies for analyses planned by the FGYA are described in Sections 4.3.2 and 4.5.2.

Table 6. Re-measurement Schedule for Historic Research Trials

Trial	2010	2011	2012	2013	2014
MacKay thinning 1954				x	
Swan Lake thinning 1977				x	
Teepee Pole Creek spacing (flat, north) sites 1967				x (low)	
Gregg spacing 1963		x			
McCardle fertilization& thinning 1984					x (defer)
Kananaskis heavy thinning (K-57) 1941		x (low)			
Gregg spacing 1984 medium site					x
Gregg Spacing 1984 low/high sites					x (low)
Clearwater fertilization & thinning 1968	x				
Ricinus fertilization after thinning 1975	x				
Strachan thinning	x				
Teepee Pole Creek strip thinning				x (low)	
Kananaskis European thinning (K-3) 1938			x		
Kananaskis economic thinning (K-58) 1950			x		
Edson fertilization and thinning (Takyi) ASRD Trial					

Table 6a. Re-measurements during first Letters of Agreement 2003-07 and 2008-2013

Trial	2003	2004	2005	2006	2007	2008	2009
MacKay thinning 1954	x					x	
Swan Lake thinning 1977	x					x	
Teepee Pole Creek spacing 1967	x						
Gregg spacing 1963				x			
McCardle fertilization&thinning 1984		x					x
Kananaskis heavy thinning (K-57) 1941				x			
Gregg spacing 1984		x					x
Gregg Spacing 1984 low/high sites		x					x
Clearwater fertilization & thinning			x				
Ricinus fertilization after thinning			x				
Strachan thinning			x				
Teepee Pole Creek strip thinning							x
Kananaskis European thinning (K-3) 1938					x		
Kananaskis economic thinning (K-58) 1950					x		
Edson Fertilization and thinning (Takyi)							x

4.4.3. Deliverables

Deliverables scheduled for the period April 1, 2010 – March 31, 2015 are listed in Table 7.

Table 7. Delivery Schedule for *Cooperative Management of Historic Research Trials*

Deliverable	Progress/ Next Steps	Reference
Ongoing measurements	Compiled data from scheduled measurements	See Table 6a.
Maintenance and protection of trials (shared responsibility) (Ongoing)	All trials marked and signed; Registration updated; Descriptions posted on internet; regional managers briefed; Prompt response to inquiries and trespass	
Analysis and publication of results (CFS)	Modelling and analysis of longitudinal and multilevel historical spacing trial data. R.Yang & J.Stewart. December 2010 Predicting individual-tree diameter growth in thinned and nitrogen fertilized mid-rotation Lodgepole Pine. R. Yang and J.D.Stewart; Date uncertain Stand Density Management and Productivity of Lodgepole Pine Stands. J Stewart and R. Yang. Date uncertain	See Section 4.4
Analysis and Publication of Results (FGYA)	Report: Validation of GYPSY 2010 (aspatial version) for application to managed lodgepole pine - December 31, 2010 Report: Validation of GYPSY (spatial version) and estimation of site indices for application to managed lodgepole pine – September 30, 2010 Report: Verification of Project 3 conclusions and quantification of effects of density on yield - March 31, 2011	See Section 4.5 See Section 4.5 See Section 4.3
Verbenone treatment	Trials to be monitored, key trials to be protected under FRIP MPB program subject to funds	

4.4.4. Finance

Table 8 shows estimated costs for the next 5 years, following the re-measurement schedule indicated in Table 6.

Table 8. Cost Schedule for FGYA Contribution to *Cooperative Management of Historic Research Trials* Project

Trial	Man-days	2009 Actual	2010	2011	2012	2013	2014	Total 2010-14
Income								
Balance Forward		18,629	14,430	7,580	2,580	2,580	2,580	14,430
Member Contribution Direct		0	0	9,825	7,250	11,462	4,912	33,404
FRIAA Authorizations		0	0	20,175	14,795	23,538	10,088	68,596
CWFC CFS contribution[8]		30,000	60,000					60,000
Total Income		48,629	74,430	37,580	24,580	37,580	17,580	176,430
Expense								
McCardle 1984 fertilization & thinning (NOR-405)	36	13,650						
MacKay thinning (A34)	56					20,000		20,000
Swan Lake thinning 1977	8					5,000		5,000
Ricinus Thinning 1975			3,150					3,150
Teepee Pole Spacing 1967 NOR-008	30	6,300						
Gregg spacing 1963 (CFS A-100)	46			20,000				20,000
Gregg spacing 1984 (NOR-4-02) (Medium site)	11	2,450					6,000	6,000
Gregg Spacing 1984 low/high sites	22	4,900						
Kananaskis European thinning (K-3)	18				9,000			9,000
Kananaskis economic thinning (K-58)	4				3,000			3,000
Clearwater fertilization & thinning 1968	22		7,350					7,350
Commercial Thinning Strachan 1952			7,350					7,350
Fertilization and Thinning Takyi Trials (SRD)	75	n/c						
Other CWFC Trial Measures			4,000					4,000
Analysis (CWFC Project, etc.)		1,596	41,000	5,000				46,000
Quality Control		3,518	2,000	2,000	2,000	2,000	2,000	10,000
Contingency, signage, maintenance		1,785	2,000	8,000	8,000	8,000	8,000	8,000
Total Annual Expense		**34,199**	**66,850**	**35,000**	**22,000**	**35,000**	**16,000**	174,850
Ending Balance		14,430	7,580	2,580	2,580	2,580	1,580	1,580
Annual Expenses plus Ending Balances		48,629	74,430	37,580	24,580	37,580	17,580	174,630

[8] Two year CWFC grant for extra HRT – related measures and analysis

Costs incurred by the FGYA in implementing the project will continue to be allocated among voting members as per Section 3.4 and Table 1 of this plan. The original agreement approved by FRIAA: *Measurement and Maintenance of Historic Research Trials* (April 2003, FRIAA Project # FOOMOD-01-02) specified FRIP payments for the first year (2003), but provided for multi-year extensions upon receipt and approval of amended work plans, budgets, reporting and payment schedules. The funding of measurements is subject to annual review of priorities by all 3 parties (FGYA, ASRD and the CFS), approval each year by the FGYA Steering Committee, and acceptance by FRIAA.

The priorities for re-measurement of historic research trials were reviewed by the R&D Associate in 2009, and accepted by the Steering Committee.

In 2009, the CFS through the Canadian Wood Fibre Centre awarded a 2-year, $50,000 grant to FRI for extra measurement and analysis of the Historic Research Trials beyond that which would normally be done. The McCardle, TeePee Pole and 1984 Gregg Low/High sites were measured using those funds. The funds will also be used in 2010 for measures of the Clearwater, Ricinus and Strachan plots, along with the calibration of historic research trials against wood quality models. At the request of the CFS, an additional $40,000 was added to the 2010 grant to cover extra costs of analysis of historic trial data.

4.5. Regional Yield Estimators

4.5.1 Justification and Purpose

The project was originally initiated to support development by the Alberta government of regional yield forecasts. Data and other assistance were provided to ASRD for this purpose by the FGYA and its members, and the results reported and posted on SRD and FGYA websites. While no further work is anticipated on the original terms of reference, the FGYA will over the next 5 years provide encouragement and assistance in testing growth and yield models produced or endorsed by ASRD for application to lodgpole pine in the Foothills region.

4.5.2 Methodology

The new version of GYPSY, released by ASRD in January 2010, will be tested against managed lodgepole pine data to 50 years of stand age across a controlled range of density and site productivity. Tests will include scatter and trajectory plots and various measures of error of prediction, bias and goodness-of-fit. The stability of model projections will be compared at 5 year intervals between stand ages of 10 and 50 years. (This information is important for determining how, and at what stand age, the FGYA regeneration model developed under Project 2 should be linked to GYPSY.) The 2010 study will be limited to testing the aspatial version. It will be expanded in 2012 to include the 2011 re-measurement, and to test the spatial version of GYPSY, which requires stocking as well as density data.

4.5.3 Deliverables

A report and / or scientific paper on validation of GYPSY will be prepared by December 31, 2010, and a follow-up paper by September 30, 2012 (also included in Table 7 under Project 4). The Association and its partners will renew activity under this project to validate growth and yield models for use in the Foothills region, and look at appropriate enhancements to improve their value. It proposes to also improve and extend the linkage between regeneration forecasting tools and conventional growth and yield models predicting rotation-age yields.

4.5.4 Finance

No direct expenditures are currently scheduled for this project. The FRIAA-GYPSY Project (FRIAA Project HIWOOD-01-129 - Growth and Yield Projection System for Regenerated Stand Management) is supporting contract compilation of the trial data and its testing against GYPSY in 2010. Additional funding may be requested for 2012.

4.6. Enhanced Management of Lodgepole Pine

4.6.1. Justification and Purpose

The project "*Enhanced Management of Lodgepole Pine*" ((FRIAA # OF-02-16) commenced in 2004 and was scheduled to run until March 31, 2009. Initiated as a joint project of the FGYA and University of Alberta, it is focused on filling information gaps in nutrition and density management of both fire-origin and post-harvest stands. It is complementary to the 5 projects already initiated by the FGYA to improve the assessment of Lodgepole pine growth and yield in managed stands, and other work being conducted in Alberta and B.C.

The project objectives are to:

1. Develop techniques and yield tables to predict the growth response of stands to density and nutrition management practices with potential for enhancing timber volume, economic value, and / or forest health.
2. Produce stand assessment guidelines and interpretative criteria for selecting nutrition and density management treatments.
3. Establish a network of sample plots for demonstrating and monitoring actual versus predicted growth responses.
4. Assess impacts of enhanced forest management practices on stand composition, structure, biodiversity, susceptibility to fire and insect damage, and wood quality.

The Project is divided into 2 sub-projects aimed at addressing the main information gaps limiting achievement of the objectives. The 2 sub-projects are: (1) Lodgepole pine nutrition and (2) pine-aspen density management. Separate experimental designs were developed for each sub-project, and are described in detail elsewhere.[9]

4.6.2. Methodology for Sub-project 1: Lodgepole Pine Nutrition

This study focuses on providing members the ability to determine:

1. Which stands on their forest management areas are most likely to respond best to fertilization;
2. What yield increases can be expected from the stands most likely to respond.

The sub-project involves sub-sampling and selective treatment of 30 stands reconnoitered in 2004, of which 15 are young (10 – 30 years of age) post-harvest, and 15 mid-late (30-80 years) fire-origin.
Baseline assessments were completed in May 2005.

Fixed-area treatment plots were established in the fall and winter of 2005 in 15 stands across a selected range of stand conditions (16 stands were budgeted but one delayed). Treatments include thinning to 2500 stems per ha (in 8 post-harvest stands only) and fertilization (300 kg per ha N plus blend) plus controls (2006). Tree, stand and foliar variables were measured prior and after treatment. In February 2006 the Steering Committee approved additional funding to extend the above experimental treatments to a total of 30 sites. The additional sites were established, and all fertilization treatments applied, by the

[9] Project OF-02-16 Annual Report (2004), Work Plan (2005-2008), and Detailed Project Design

end of May 2006. Post-fertilization foliar analyses were conducted in the winter of 2006-7 (i.e. 1 growing season after treatment and 2008-09 (i.e. 3 years after treatment). Three-year mensurational re-measurements were taken on the 15 young stands during the winter of 2008-09. (The growth response in the older stands was not expected to yet be sufficiently well defined.)

It is proposed to undertake mensurational re-measurements of all stands in 2013-14, with the possible exception of those most severely damaged by snow. At that time 5 years will have elapsed since the last measurement, and 8 years since treatment. By this time, any significant response to treatment should be detectable and, for the most part, complete.

4.6.3. Methodology for Sub-project 2: Pine-aspen Density Management

The study assesses, on pine sites subject to hardwood competition, what density management alternatives are expected to provide the best total and coniferous timber productivity.

The sub-project involved selection of 18 post-harvest pine-aspen stands between 10 and 40 years of age, partitioning the stands into areas of high, medium and low aspen density, and measuring 6 plots in each stand. Plots were tree-mapped and measured in detail. A sub-sample of 3 plots in each of 9 of the stands was destructively sampled to obtain retroactive data on height and diameter increment for both pine and aspen. Field work was conducted in 2006 and 2007. The analysis involved assessment of competition indices and responses useful for developing or validating whole-stand, individual-tree, and/or distance-dependent growth models.

Other than completion of the pending analysis and report by the U of A, no further work is contemplated on this sub-project during the next 5-year period.

4.6.4. Deliverables

Table 9 shows the schedule of activities by fiscal year (April 1 – March 31) from 2006 onwards. Activities are shown as “done” if completed, or as “x” if scheduled for 2010 or later. This project is behind schedule awaiting two outstanding reports by U of A scientists.

Table 9. Activity and Delivery Schedule for *Enhanced Management of Lodgepole Pine* Project

Activity	2006	2007	2008	2009	2010	2013
Sub-project 1: Lodgepole pine nutrition						
Installation and pre-treatment measurement	done					
Thinning, fertilization and post-treatment measurements	done					
1-year post-fertilization foliage analysis	done					
3-year growth response measurements [10]			done			
3-year post-fertilization foliage analysis			done			
Analysis (3-year results and projections)				not done	X	
Sub-project 2: pine-aspen density management						
Stand selection	done					
Field sampling		done				
Analysis		part done			X	
Analysis, synthesis of results and reporting						
Scientific paper (pine-aspen results) U of A			Interim report	Quick-note	X	
Information reports (2) (EMLP1 and 2 Est. Reports) FGYA		done				
Information report (EMLP1 3rd Year Foliar Response) U of A					X	
Extension Sub-project 1: Thinning and fertilization response						
8-year growth response measurements (FGYA)						X
Analysis and report (FGYA)						X

4.6.5. Finance

The project (FRIAA # OF-02-16) was supported with FRIP funding to a maximum of $442,800, provided under FRIAA's *Open Funds* initiative. This amount was augmented by $108,810 of supplementary funding in 2006, and a $9,300 transfer from Project 1 contingency funds in 2008 to increase the total budget to $560,910. Table 12 shows costs by year. Note that this schedule applies to the whole project term, which was initially from April 1, 2004 to June 30, 2009.

FGYA costs for analysis from 2007 onwards (primarily time inputs by the Research and Development Associate) are covered under Project 1. Under the Collaborative Research Agreement, costs of scientists from the University of Alberta were absorbed by the University.

Historical and current funding for the project is shown in Table 10. New funding will need to be procured by 2013 for the final measurements.

[10] Fire-origin stands were not measured because of extraordinary costs in establishment and stem mapping. If needed, funding for these measurements will be sought through other proposals, though at this time, no measurements are proposed.

Table 10. Cost Schedule for *Enhanced Management of Lodgepole Pine* Project – Current Funding

Item	2004 (actual)	2005 (actual)	2006 (actual)	2007 (actual)	2008 (actual)*	2009 (Actual)	2010 Planned	Total (funded)
Income								
Balance Forward		65,269	45,587	34,588	3,043	(5,410)	(5,410)	
FRIAA	126,200	126,900	202,110	6,300	39,024		5,010[11]	505,544
Other funds			6,066					6,066
Transfer from project 1			40,000		9,000		400	49,000
Total Annual Income	**126,200**	**192,169**	**293,763**	**40,888**	**51,067**	**-5410**	**0**	**561,010[12]**
Expense								
Sub-project 1 (nutrition)	44,734	120,950	148,406	0	56,477[13]			370,537
Sub-project 2 (pine-aspen)	0	21,354	108,497	37,845	0			167,694
Design and analysis	16,197	4,278	2,272	0	0			22,747
Total Expense	**60,931**	**146,582**	**259,175**	**37,845**	**56,477**	**0**	**0**	**561,010**
Ending Balance	**65,269**	**45,587**	**34,588**	**3,043**	**(5,410)**	**(5,410)**	**0**	**0**

4.7. Regeneration Management in a Mountain Pine Beetle Environment

4.7.1. Justification and Purpose

The project *Regeneration Management in a Mountain Pine Beetle Environment (*FRIAA Open Funds Project # OF-07-P019) began in late 2007, and has been extended to a second phase through FRIAA's Fire Hazard Reduction and Forest Health Program (Project # FHRFHP-028).

The overall objective of the project (Phase 1 and 2) is to provide operational decision support to forest managers assessing silvicultural treatment options for stands attacked by mountain pine beetle in Alberta.

Achievement of the objective was commenced in Phase 1 by assembling baseline data and applying the best predictive capability immediately available to making projections from these data, while recognizing the need for ongoing monitoring in a second phase.

The high over-wintering success of beetles in 2008-09, combined with higher and more extensive than expected flight activity during the summer of 2009, created the urgent need for monitoring an expanded network of sites during 2010 and 2011. The dynamics of MPB-attacked stands will be monitored in order to validate, inform and improve projections used in critical post-attack forest management decisions.

[11] Balance to be paid upon submission and acceptance of reports outstanding from U of A cooperators
[12] Total Income over project is annual totals less balances forward each year
[13] Measurements $47,334, foliar analysis $9,143

4.7.2. Methods

Project methodology is described in the Phase 2 proposal and work plan (*Monitoring and Decision Support for Forest Management in a Mountain Pine Beetle Environment*, Phase 2 Proposal for the Period September 1, 2009 – March 31, 2012, September 29, 2009).

A preliminary Decision Support Tool was described at a workshop on June 17, 2010, and following the workshop a deployment and user-feedback plan for the DST was issued (July 20, 2010). The plan, currently being implemented, involves:

- Deployment of the preliminary DST to a first-round user group (done August 6, 2010);
- Evaluation by FGYA and MPBEP Activity Team members;
- Management of user feedback and enquiries (contracted and in process);
- User-feedback workshop (to be scheduled);
- Development of a DST enhancement plan (by December 31, 2010).

4.7.3. Deliverables

Table 11 shows the current Delivery Schedule and status of the project. The schedule will be adjusted and extended depending on user-feedback on the DST, and the progress of the MPB infestation.

4.7.4. Finance

This project is supported by funding from the Foothills Research Institute's Mountain Pine Beetle Ecology Program, as well as FRIAA Open Funds (Project OF-07-PO19), (Project FHRFHP-028, November 2009). An annual contribution by the FGYA to the project represents the time of the Research and Development Associate providing scientific and technical direction to the project, as well as some time by the Director. These costs are already accounted for under Project 1 – Development and Management of the Association. Funding and deliverables are for the five – year term of phases 1 and 2 of the project. FRI funding includes the time of the MPBEP Program head in managing the business and logistical aspects of the project.

The Project is funded until March 31, 2012. Funding will be sought for an additional 3 years, to March 31, 2015.

Table 11. Delivery Schedule for *Forest Management in a MPB Environment*

Deliverable	Progress/ Next Steps	Reference
A report of the BC and US experience and research (based in part on tour of areas subjected to attack in BC)	Done.	Dempster, W.R. 2007. Tour of Mountain Pine Beetle Affected Areas in the Prince George Forest District, July 11 and 12, 2007: Draft Report and Recommendations. 20pp + Appendix.
A research proposal describing detailed project design	Done	Udell, R.W. and W.R. Dempster. 2007. Monitoring and Decision Support for Forest Management in a Mountain Pine Beetle Environment: Proposal. October 9, 2007. FRIAA-07-08 Provincial Projects Initiative. 24pp.
Assessment of PSP supplementary data requirements	Done	MacDonald, E., Development of sampling protocol to quantify / document vegetation responses to MPB attack, June 25, 2008.
Pre-compilation of existing data and selection of candidate plots	Candidate list developed and compiled for 240 PSPs	Access database and Excel spreadsheets (including selection variables and criteria)
Baseline supplementary field measurements	149 plots completed; remainder deferred until infection detected	
Compilation of existing and new data – PSP database development	Data entered, verified, compiled and documented by contractor	Access database plus documentation: Data compilation report – 2008 surveys; Access database 2008 tables description; SAS programs description.
Dendrochronological measurements and analysis	Measurements and analysis conducted and reported for 20 plots (15 stands); no representation in southern portion No further work currently scheduled	Report: Alfero *et al*, Dendroecology and stand dymamics of a selection of PSPs in Alberta.
Revised work plan and funding proposal (Sept 29, 2009 FRIAA Proposal)	Expansion of MPB infestation supported by Fire Hazard Reduction and Forest Health initiative. FGYA secured additional funds for a proposed Phase 2 of the project – to monitor the dynamics of MPB-attacked stands for improved management decision-making.	- Updated work plan and phase 2 proposal for the period September 1, 2009 – March 31, 2012 September 3, 2009 - Monitoring and decision support for forest management in a MPB environment - Phase 2 proposal September 29, 2009
Basic monitoring (tree mortality)	87 plots – 2009 (done) 64 plots – 2010 (scheduled and in progress) 89 plots – 2011 (scheduled)	- Technical Note 2010-5, Monitoring and Decision Support for Forest Management in an MPB Environment – Progress Report for 2009, April 30, 2010
Detailed monitoring (vegetation status)	23 plots – 2010 (done) 42 plots – 2011 (scheduled)	
Decision support tool	Design work shop held June 26, 2009	- Foothills Research Institute - Foothills Growth and Yield

Deliverable	Progress/ Next Steps	Reference
	Detailed terms of reference and specifications for a preliminary DST completed October 2009 Prototype demonstration, June 17, 2010 Deployment plan and DST documentation issued, July 2010 Preliminary DST release to first-round user group, August 6, 2010 Enhancement Plan (scheduled December, 2010)	Association MPB-Silviculture Decision Tools Workshop, Friday, June 26, 2009 Hinton Training Centre, Hinton, Alberta, Workshop Report. - MPB-DST Deployment and Enhancement Plan, July 20, 2010 - MPB Decision Support Tool Application Development (report, July 23, 2010)

5. Budgeting and Payment Schedules

The following organizations are sponsoring members of the FGYA:

- Alberta Newsprint Company
- Blue Ridge Lumber
- Canadian Forest Products
- Millar Western Forest Products
- Spray Lake Sawmills
- Sundance Forest Products
- Sundre Forest Products
- Hinton Wood Products
- Weyerhaeuser Canada

All are companies or corporate divisions holding Forest Management Area tenures in the Foothills Natural Sub-regions of Alberta.

Each member contributes:

- An annual member fee of $18,000 ($21,000 authorized in original agreement) either directly or through FRIP Authorizations;
- In kind services, including measurement, treatment and maintenance of the *Regenerated Lodgepole Pine (RLP) Trial* (Project 2);
- Funding to other projects, pro-rated by pine-leading managed area according to a formula specified in the Business Plan Section 3.4.

Specific funding by project is included with the project description, however the general description of the type and manner of funding is briefly described below:

Project 1, Development of the Association, is supported by the membership fees of the nine member companies, either paid directly (4 companies) or through FRIAA Authorizations (5 companies). This includes the management and field coordination of the FGYA programs as well as the research development, design and technical services of the Research and Development Associate.

Project 2, Regenerated Lodgepole Pine, is supported by in-kind services of the membership (plot measurement) as well as the annual membership fees paid.

Project 4, Historic Research Trials, is supported by annual membership contributions pro-rated based on the proportional representation of Lodgepole pine stands within individual FMAs compared to the total Lodgepole pine stand area in the cumulative member FMAs. It is also supported by a 2-year, $90,000 grant from the Canadian Wood Fibre Centre of the Canadian Forest Service.

Project 6, Enhanced Management of Lodgepole Pine, is supported with FRIAA Open Funds.

Project 7, Regeneration Management in a Mountain Pine Beetle Environment, is supported with FRIAA Open Funds, with funding from FRI's MPBEP and with in-kind support from SRD and the FGYA.

Table 12 summarizes funding sources for 2010 -2015.

Table 3. Scheduled income for 2010-2015

Project	Contributing Organization	Carry Forward	Cash Committed	Total Funding	In-kind Support	Comments
Project 1: Association Management	Members	159,378	810,000	969,378		Member fees including FRIAA Authorizations
Project 2: Regenerated Lodgepole Pine	Members				1,021,900	Fieldwork
Project 4: Historic Research Trials	Members, CFS	14,430	162,000	176,430		Member contributions including FRIAA Authorizations, CWFC grant
Project 6: Enhanced Management	FRIAA Open Funds OF-02-16	(5,410)	5,410[14]	0		Enhanced management of Lodgepole pine
Project 7: Mountain Pine Beetle	FRI and FRIAA Open Funds					Reported under FRI's Mountain Pine Beetle program
Total FGYA		**168,398**	**977,410**	**1,145,808**	**1,021,900**	

Details on the annual and projected income and expenditures for each of these projects may be found as follows:

Project 1 – Management of the Association -	Table 2
Project 2 – Regenerated Lodgepole Pine -	Table 5
Project 3 – Comparison of Pre- and Postharvest Stand Development -	No direct costs
Project 4 – Historic Research Trials -	Table 8
Project 5 – Regional Yield Estimators -	No Activity
Project 6 - Enhanced Management of Lodgepole Pine -	Table 10

FGYA technical and analytical input by the Research and Development Associate to the various projects is covered under Project 1.

[14] Final FRIAA payment pending submission/acceptance of final reports

Appendix 1: Foothills Growth and Yield Association Annual Meeting

Steering Committee Meeting

March 25, 2010 1:00pm – 4:30pm
Stanley A. Milner Library
Room 7, sixth floor
Churchill Square, Edmonton

Attendees

Company Reps

Tim Burns – Blue Ridge Lumber
Richard Briand – Hinton Wood Products
Greg Behuniak – Weyerhaeuser
Tim Gylander – Weyerhaeuser
John Huey – Sundance
Dwight Weeks – Canfor
Tim McCready – Millar Western
Bob Held – Sundre Forest Products
Darryl Kelly – Spray Lakes

Government/Other

Bob Udell –FGYA
Dick Dempster – FGYA
Dave Morgan – SRD
Sharon Meredith – SRD (scribe)
Tom Archibald – Foothills Research Institute

Dwight Weeks called meeting to order at 1:07.

1) Review of Minutes and Action Items of March 20, 2009

Dwight reviewed action items from the March 20, 2009 Steering Committee meeting summarized in the following table:

Item	Reference
Dick Dempster to provide breakdown of his time by project	See RDA Report for 2009 and Table below
Establish Quality Control/RLP Database Subcommittee	1. RLP Task Force Report July 10 2009 2. Recommendation to extend TL contract for Dbase Management July 10 2009. 3. 7 of 9 voting members accepted recommendation on "Doodle" poll.
Project 2 RLP. Dick Dempster to review need for annual status checks	Review done, see notes. Regeneration is still in dynamic state, recommend continuing to performance survey dates, then re-evaluate.
Project 4 Historic Trials. Dick Dempster to review priority algorithm for historic trial remeasurements	Review done. Existing protocol for selection is still viewed as appropriate. See protocol.

Motion: Dwight Weeks moved to adopt the minutes as recorded. Seconded by John Huey. Carried.

2) New Business

a. Election of New Chair

Dwight resigned as Chair of Steering Committee (end of two year term) and called for nominations for a new Chair. Richard Briand nominated Greg Branton; Greg accepted the nomination. No additional nominations were made in the second or third call for nominations. Greg Branton was elected Chair of the Steering Committee by acclimation.

Greg thanked Dwight for his efforts over the last few years.

b. Review of 2009 Program (preliminary annual report)

Bob Udell reviewed the draft annual report. Numbers are forecast to year end based on latest printouts from FRI. Year end actual costs will be used to produce the final Annual Report. Highlights for each project are as follows:

Project 1: Table 1 needs to be revised to be consistent with page 18 of draft business plan for actual expenditures and carry over. Rand McPherson did good job as field coordinator and in particular his early season work with contractors was helpful in ensuring measurements were done correctly.

Project 2: Was discussed in detail at technical committee meeting, so not repeated as most Steering Committee members were present.

Project 3: A grant from CFS will be used for measurements this year.
Note: Signs for Clearwater plots. Question also of signs for other trials and ones we don't maintain.

Action: Clearwater Plot signage to be assessed - installed or upgraded if needed.

Project 6: Cautiously optimistic that U of A will deliver its papers and technical reports.

Project 7: Will be covered in detail in workshop tomorrow.

Communication and Extension: Met all targets except producing Quicknotes. Dick did produce technical notes that could be revamped as Quicknotes. This is not really an issue for FRI.

i. Director & Field Coordinator

Bob Udell stated that the forecast of number of days was generous and he tried to limit time spent to allow more time to be spent by Field Coordinator. Bob has enjoyed being Operations Director and appreciated support from a number of people, but would like this year to be his last in that role. Greg Branton said that he wants to see transitional plan in place.

ii. Research & Development Associate

Dick Dempster went over his report in detail in the morning technical committee meeeting, so only highlighted some important items. Some of his time on MPB DST is covered under the FRI MPB budget. Most of his of work was on Project 2 (RLP). His total days to year end will be 135 and he was budgeted for 110. He is not charging for the extra days. He expects less time will be required for next year as most of the outage was in planning and management and the same issues are not expected to occur next year.

Action: Bob Udell will cross check all numbers in annual report against the Business Plan before submitting to FRIAA.

Motion: Dwight Weeks moved to approve the annual report subject revisions to Tables based on final FRI accounting numbers. Seconded by Tim Burns. Carried.

c. Five Year Business Plan/ 2010 Work Plan Review/Approval

Bob Udell reviewed the 2009/2010 Business Plan, which includes suggesting more emphasis on Field Coordinator time and recommending carrying on with the Timberline contract for the database. Expenses include GIS, database and misc. services. No field tour was held last year and none is planned for this year, but the business plan proposes one every second year after this year.

Because the tenth year of project is complete, Bob Udell will need to submit an annual report and new five year proposal. Carson MacDonald is prepared to issue annual amendments to the agreement instead of a new five year project, but each year's plan amendment still projects out five more years. A new five year plan will signal the commitment of the members to the ongoing program.

Motion: John Huey moved that the FGYA should submit a proposal for a new 5 year project to FRIAA. Seconded by Richard Briand. Carried.

Note: Dwight Weeks advised that Canfor will advise whether it can continue to support the FGYA's program after reviewing the draft project plan.

Dick asked for Input from Steering Committee on co-authoring an academic paper for submission to the Canadian Journal of Forest Research, inviting Andreas Hamman to present at the June workshop, and posting the crop performance report and Technical Note on climate influence on mortality. Greg Branton said that approval of the work plan would constitute approval of these things.

Considerable discussion about Table 2 and why there appears to be money that wasn't expected coming from FRIAA. Bob needs to have conversion with Carson about this $116,550 and where that money has come from. It seems like there is an accumulation of FRIP money, possibly a holdback on the project. Membership fees of $18,500 should be enough to carry the Project 1 forward if this is the case. If the FGYA gets the $116,550 from FRIAA, it might even be possible to reduce membership fees. Dwight recommended maintaining membership fees at a steady state over the five years, rather than reducing them on a one time basis for a year.

Action: Bob Udell will talk to Denise and Carson. He will find out from Carson where the money came from that wasn't "on our radar screen." He will provide clarification to the Steering Committee.

Action: Bob Udell will change Table 2 to show what payment for all membership fees is and what ending balance and what the ending balance would be (i.e. Reconcile Annual Report with Work Plan numbers). He will also look at scenarios to determine much the fees could be reduced and still maintain a positive balance at end of five years.

Motion: Richard Briand moved to approve the 2010/2011 work plan subject to changes to Table 2. Seconded by Greg Behuniak. Carried.

d. Staff and Assignments 2010/11

Bob Udell presented his proposal for staff and assignments in 2010/11. It was proposed that Bob Udell continue as Operation Director (30 days) and Rand McPherson continue as field coordinator (40 days).

It is proposed to use Timberline for database work for 2010/2011. Timberline was asked to provide an estimate for continuing to manage the database. A discussion of the Timberline proposal ensured. Some of the numbers seemed high, particularly work on QC routines and making the contractor loading database.

Action Item: Dick and Bob Held and Rand McPherson will talk and then will go back to Timberline with clearer picture of what we are doing this year and ask them to revise their estimate.

It was proposed to renew the rolling 2 year contract with the Research and Development Associate. Dick can see being involved in the Association at least until the RLP project converts into a regular growth and yield plots after the 14 year performance survey window. He would also like to see MPB project through to completion.

Bob Udell and Dick Dempster were excused from the discussion of staff and assignments.

Motion: ***Dwight Weeks moved to accept Bob Udell as Operations Director for a year, Rand McPherson as Field Coordinator for a year, and Dick Dempster as Research and Development Associate for two more years. Seconded by Bob Held. Carried.***

Motion: ***Bob Held moved to accept Timberline as field database manager this year subject to a capped price of $24,500. Seconded by John Huey. Carried.***

Action Item: Bob Udell, Greg Branton and Richard Briand will discuss finding a new Operations Director and be ready to have a replacement at the next AGM/Steering Committee meeting.

e. Other Business

i. Name of Association

Tom Archibald explained that the possibility of a name change arose because of a GST audit at FRI. The name "Foothills Growth and Yield Association" bothered the auditor and caused a lot of problems in the audit. Part of the issue was proving that FGYA was not a separate entity, but a program under the Foothills Research Institute. Discussion ensued around why the name was chosen originally and whether association has a different legal connotation federally than under Alberta law. The Steering Committee was very reluctant to change the name unless necessary.

Action Item: Tom Archibald will talk to Revenue Canada and see what they will accept in terms of a name. As a last resort he will contact FRI's lawyer or ask a board member to talk to their lawyer. As a last resort, the FGYA will look at changing its name.

Motion: ***Greg Behuniak moved to remove reference to changing the FGYA name from work plan. Seconded by John Huey. Carried.***

f. Authorizations for Admin and Funding

Deferred pending update to Business Plan (new five year plan proposal) and determination of what membership fees will be.

Greg Branton adjourned the meeting at 3:16.

Appendix 2: Foothills Growth and Yield Association Committee Membership

Role / Affiliation	First Name	Last Name	Telephone
Chairman	Greg	Branton	(780) 778-7012
Management:			
FRI General Manager	Tom	Archibald	(780) 865-8332
FGYA Director	Bob	Udell	(780) 865-4532
Research and Development Associate	Dick	Dempster	(780) 984-2509
Field Coordinator	Rand	McPherson	(780) 865-3236
Steering Committee:			
ANC Timber	Greg	Branton	(780) 778-7012
Alberta Sustainable Resource Development (Jan 011)	Darren	Tapp	(780) 427-5324
Blue Ridge Lumber	Tim	Burns	(780) 648-6220
Canfor	Dwight	Weeks	(780) 538-7745
Foothills Research Institute Board	Dan	Rollert	(780) 865-7171
Millar Western Forest Products	Tim	McCready	(780) 778-2221
Spray Lakes Sawmills	Ed	Kulscar	(403) 932-2234
Sundance Forest Industries	Pat	Golec	(780) 723-3977
Sundre Forest Products	Bob	Held	(403) 638-4482
Hinton Wood Products	Richard	Briand	(780) 865 8181
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