

Cooperative Forestry Research Unit

Program Prospectus
2011-2015



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SUMMARY

Maine's large forestland owners have long recognized the need to support a strong research effort as part of their managing Maine's forests. About thirty-five years ago, a small group of visionary forest industry leaders and representatives of the University of Maine formed the Cooperative Forestry Research Unit (CFRU). Currently composed of 32 private and public forestland management organizations from across the state, CFRU guides and supports research on key issues facing Maine's forest landowners and managers. CFRU is one of the oldest industry / university forest research cooperatives in the United States, and continues to serve as a model of joint leadership and cooperation between Maine's largest industry and the University of Maine.

Every five years the CFRU surveys the research priorities of its members, and develops a prospectus that guides research and technology transfer activities over the next five-year period. The following 2011-2015 prospectus serves as a guide for the operation of the University of Maine's Cooperative Forestry Research Unit.

INTRODUCTION

Since before Maine was a state, its forests have been part of a long heritage vital to the economic, social, and environmental well being of its people. With 17.6 million acres of forests, Maine is the most heavily forested state in the nation (89%) and is unique in that more than 96% of its timberland is privately owned. Maine's forests account for roughly half of the wood production in the Northeastern Region (New York, Vermont, New Hampshire, and Maine) and provide the largest manufacturing industry in the state (NEFA 2007). Each 1,000 acres of forestland in Maine supports 1.2 forest-based manufacturing, forestry and logging jobs and 0.7 forest-related tourism and recreation jobs. Thus, Maine forests have been the backbone of the State's industrial economy as well as the tourist and recreational industry.

Due to the overwhelming importance of the state's forest resource, Maine's largest landowners are continually seeking ways to improve the productivity and sustainability of their forests. Improving forestland stewardship requires a constant flow of new information about how to effectively and efficiently manage a wide range of forest resource values in an environmentally sound manner. Amidst the devastation created by the spruce budworm outbreak in northern Maine during the 1970-80s, the state's largest landowners formed the Cooperative Forestry Research Unit (CFRU) at The University of Maine to support science-based research on key issues facing forestland managers. CFRU members pursue applied research projects that will help them increase forest productivity, improve forest management, protect water quality, and conserve forest biodiversity.

To ensure that CFRU serves its members in an effective and efficient manner, a program prospectus is developed every five years that defines overall research priorities and directions, as well as how the unit will operate. The CFRU staff and Advisory Committee use the prospectus as a reference and plan for developing, implementing, and evaluating all research projects and technology transfer activities. This CFRU prospectus serves as guide for operation of the University of Maine's Cooperative Forestry Research Unit from 2011 to 2015.

ACCOMPLISHMENTS BASED ON THE 2006-2010 PROSPECTUS

The CFRU publishes an annual report that provides members with a detailed description of progress made on projects approved by the Advisory Committee. Five annual reports were published from 2006 to 2010 that documented CFRU accomplishments toward the goals and objectives identified from a 2005 research priorities survey of CFRU member organizations.

Details of these accomplishments can be found by reviewing these annual reports on the CFRU web page (www.umaine.edu/cfru), as well as the associated research reports and other publications that were produced from these works. The following provides a brief overview of accomplishments achieved toward each 2006-10 objective:

1. *Improve **growth and yield models** for hardwood, mixedwood, and softwood stands that include the effects of thinning (commercial and precommercial) and other partial cutting systems currently being used..*
 - A project refining the Forest Vegetation Simulator (FVS) Northeast Variant was begun and a beta version of the model is nearing completion.
 - Stem taper and volume equations were developed for most softwood species in the Acadian Region.
 - CFRU members joined industry and university partners from around the country in the Center for Advanced Forestry Systems (CAFS), which is sponsored by the National Science Foundation (NSF).
2. *Improve knowledge about **commercial thinning strategies**, including timing of entry, spacing standards, prioritizing stands, and other decision-making criteria for softwood, mixedwood, and hardwood stands..*
 - Three study locations were added to the Commercial Thinning Research Network (CTRN) in 2009 that address questions about commercial thinning in mid-quality spruce-fir stands. Work continued on the measurement and maintenance of 15 sites, on two studies across the state with over 16,000 tagged trees.
 - A relational database was developed to track progress, warehouse data, and document treatments of the CTRN.
 - Two studies were completed on the crop tree silviculture of white pine in mixed stands.
3. *Increase understanding about **partial cutting**, including: improved harvesting machines and trail design, effects of and ways to minimize logging damage to residual stands, and long-term implications for stand growth and development.*
 - Research was conducted on the assessment of trail spacing to increase productivity during typically inefficient energy-wood harvests.

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4. *Increase understanding about **riparian zone management**, including the effects of harvesting practices on water quality and buffer strip requirements.*
 - Eight seasons (2001 to 2008) of data from streams harvested without a buffer on water temperature, recovery (re-growth) of riparian vegetation and canopy cover (i.e., shade) were completed and summarized.
 - A riparian biodiversity project was completed which documented the degree to which riparian management zones provide ecological benefits beyond simply protecting stream water quality.

5. *Improve methods for **managing forest biodiversity**, including: determining costs associated with managing for late-successional features in managed forests, developing landscape planning tools for managing biodiversity, developing methods for enhancing ecological value through partial harvesting, and developing a scoring system for quantifying ecological value in partially harvested stands.*
 - Nine indicators of biodiversity health were identified which exist independent of landowner boundaries and are suitable at appropriate scales ranging from the stand to landscape levels.

6. *Improve methods for **managing for wildlife habitat**, including: identifying landscape-level habitat requirements for important wildlife species, understanding the affect of forest management on wildlife habitat, and determining optimum snag, coarse woody debris, and retention tree characteristics for maintaining stand-level wildlife habitat.*
 - A study is near completion documenting changes in deer wintering areas (DWAs) in northern Maine from 1975 to 2007.
 - Work continued on the monitoring of cycles of snowshoe hare populations which greatly affect the persistence and reproduction of lynx on the landscape.

7. *Improve silvicultural **strategies for young, naturally regenerated stands**, especially improving the regeneration of softwood species in mixedwood stands.*
 - A comprehensive analysis of pre-commercial thinning was evaluated and results indicate that PCT increases the financial value of forest stands over a rotation.

8. *Improve **hardwood silviculture**, including development of: effective intermediate treatments for young, even-aged stands of northern hardwoods to improve species composition, stem quality, growth, and shorten sawlog rotations; strategies for growing and maintaining quality northern hardwoods as an integral component of mixedwood stands; and methods for reducing beech and other competing vegetation in hardwood stands.*

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- An investigation into the control of the overabundance of beech regeneration following shelterwood and selection harvesting provided a low-cost practical solution for improving the understory composition in northern hardwood stands.
 - Four hybrid poplar clones were tested under intensive management on a typical forest site and due to their poor performance plantations of this type are not recommended on anything but high quality sites in Maine.
9. *Other research projects identified by CFRU members and staff during 2006-10.*
- Over five and a half million acres of CFRU member lands were mapped for the depth-to-water table.
 - A spruce budworm decision support system was developed and predictions for Maine's large acreage of susceptible stands were made.

MISSION

The mission of the CFRU for 2011-2015 will continue to be “*conduct applied scientific research that contributes to the sustainable management of Maine’s forests for desired products, services, and conditions.*”

FIVE-YEAR OBJECTIVES (2006-2010)

Based on results from a 2011 survey of CFRU member organizations about their research priorities for 2011-2015 (see Appendix I), the objectives of CFRU research will be to:

1. Improve knowledge about *COMMERCIAL THINNING STRATEGIES*, including: methods, timing of entry, spacing standards, prioritizing stands, and other decision-making criteria.
2. Further understanding about the effects of *PARTIAL HARVESTING PRACTICES* on regeneration, stand development, productivity, stand management, and future stand values.
3. Provide scientific data on current and emerging *WILDLIFE HABITAT MANAGEMENT* issues such as: deer wintering areas, threatened & endangered species, and others.
4. Develop and refine *GROWTH & YIELD MODELS* for Maine forests, and produce inexpensive and efficient tools for forest managers.
5. Enhance understanding about how *FOREST OPERATIONS* such as harvest methods, equipment, roads, stream crossings, and labor influence management efficiency and wood costs.

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6. Use science-based analysis to evaluate the impact of various *FOREST PRACTICE REGULATIONS*, such as the Forest Practices Act, on forest resources, landowners, and the industry.
7. Improve understanding about *BIOENERGY and BIOREFINERIES*, and how biomass supply, markets, harvest methods, transportation, and related supply-chain issues could affect forest industry and sustainability in Maine.

Results from this research will be communicated to CFRU members using the most preferred methods of technology transfer: web-based short research notes, publications search engine, and information summaries, as well as regular field tours.

The CFRU is always open to new research ideas and proposals that have important implications for forest management in Maine. The purpose of the above list of research objectives is to 1) identify the highest priorities needs for CFRU members, 2) provide a framework for identifying Cooperating Scientists and Project Scientists, 3) prioritize allocation of research funds, and 4) serve as a benchmark for progress over the next five years.

It is the policy of CFRU to encourage shared funding for relevant research projects from as many non-CFRU sources as possible. It also is recognized that research objectives associated with silviculture and forest productivity are likely to be supported principally by CFRU funding. Research priorities that have broader environmental or social implications are likely to be of interest to other funding agencies as well, and thus require significant shared contributions from other sources.

GUIDING PRINCIPLES

CFRU will conduct research to achieve the above objectives that is guided by the following principles:

- Research will be conducted that focuses primarily on developing applied information that can be used by CFRU Cooperators to improve forestland management. However, since increasing fundamental understanding about forest ecosystems can often make the most significant strides toward improved management, basic research efforts that are closely aligned with applied research objectives will be encouraged.
- Experimental design, methods, and procedures used in CFRU research will achieve the highest standards.
- Since field research involves a substantial investment, every effort will be made to encourage projects led by research teams that include interdisciplinary questions and collaboration.
- All research projects will seek to optimize opportunities for leveraging through shared collaborations, in-kind contributions, and funding with other organizations that have similar goals and/or the required expertise.
- Research results from CFRU projects will be rapidly communicated to Cooperators using the most effective means of communication (including oral presentations at Advisory Committee

meetings and workshops, as well as web-based publications). Completed research will be promptly submitted for publication in refereed scientific journals.

- Since success of the CFRU relies heavily on the collaborations between Scientists and Cooperators, vigorous cooperation is expected from each Cooperator, including direct participation and in-kind contributions for Approved Research Projects.

ORGANIZATIONAL DESIGN

A strong organizational design will be maintained to accomplish the above mission and research objectives. Objectives for the organizational design include:

- Enhancing cooperation and teamwork among scientists, staff, students, and cooperators;
- Enhancing productivity, creativity, and synergy;
- Increasing efficiency and accountability;
- Attracting the most productive and accomplished researchers;
- Encouraging interdisciplinary research;
- Optimizing flexibility with changing research needs;
- Maximizing operating funds available for research; and
- Encouraging shared funding and integration of research projects with MAFES and other academic departments at the University of Maine, as well as other researchers, organizations, and external funding agencies.

Figure 1 shows the overall organizational structure for the CFRU. The specific roles, responsibilities for each component, in addition to the relationships among components, are described below:

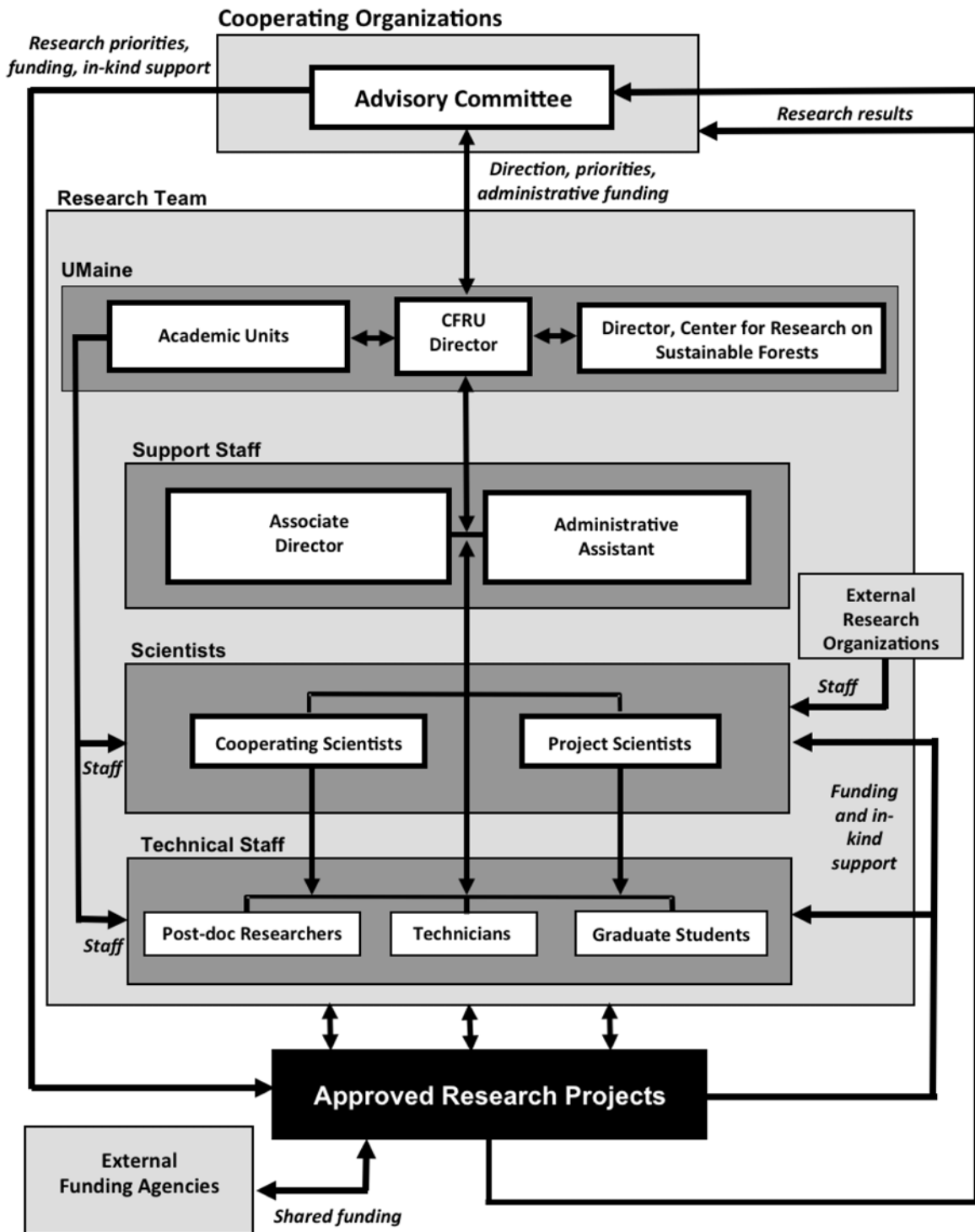


Figure 1 – CFRU organizational structure.

1. Cooperating Organizations

The CFRU serves the applied research needs of its member organizations which include 1) forest landowners and managers, 2) mill owners and wood processors, 3) corporate businesses or other organizations, and 4) individuals. Cooperating Organizations financially support CFRU and govern its affairs through an Advisory Committee. Four categories of membership are provided for each type of Cooperating Organization wanting to support the advancement of forest management practices in the state of Maine through CFRU research. The cost and services provided for each of the four classes of membership are described in the Bylaws (see Appendix II).

A. Advisory Committee

All Cooperating Organizations are represented by an Advisory Committee. Representation on and rules governing the Advisory Committee are described in the Bylaws (see Appendix II) and Policies and Procedures (see Appendix III). The function of the Advisory Committee is to:

- Define the mission, objectives, and guiding principles for CFRU;
- Define the research needs and priorities for the expenditure of funds contributed by Cooperating Organizations;
- Approve appointments of Director and Cooperating Scientists;
- Review research proposals submitted by Scientists and outside organizations for relevance to CFRU objectives and budgets;
- Approve funding for all Approved Research Projects and CFRU administrative budget;
- Provide assistance, as needed, to Scientists in implementing Approved Research Projects, identifying and securing opportunities for direct cooperation and in-kind contributions for research on cooperator lands;
- In cooperation with CFRU Director, ensure results from Approved Research Projects are delivered in a timely manner by Scientists and outside agencies;
- In cooperation with CFRU Director and Scientists, ensure that research results from Approved Research Projects are disseminated to all Cooperating Organizations in a timely and efficient manner;
- Develop and maintain a level of base funding needed to adequately run the CFRU; and
- Recruit new members.

2. Research Team

CFRU research and other activities are conducted by a Research Team consisting of University of Maine (UMaine) Scientists, Support Staff, and Technical Staff. The Research Team achieves the mission and objectives of CFRU as set by the Advisory Committee through Approved Research Projects. The Research Team consists of the Director, Scientists, Support Staff, and Technical Staff.

A. University of Maine

The CFRU is housed at and administered by the University of Maine (UMaine) within the Center for Research on Sustainable Forests. UMaine Academic Departments, external research organizations, and external funding agencies support and/or collaborate in Approved Research Projects.

1) CFRU Director

The CFRU is led by a Director with the following responsibilities:

- Lead and coordinate all activities of the Research Team to accomplish the CFRU mission and objectives in a timely, fiscally-efficient, and high-quality manner;
- In cooperation with Advisory Committee, identify and select Cooperating Scientists and other researchers that can meet the CFRU mission and objectives;
- Maintain a high degree of collaboration, coordination, cooperation, resource sharing, and communication among Research Team members;
- Work closely with Associate Director, Scientists, and other researchers to conceive, develop, and implement Approved Research Projects that advance the mission and objectives of the CFRU;
- Serve as a Cooperating Scientist (where appropriate), developing proposals and conducting research to meet CFRU objectives in his or her field of expertise;
- Supervise Support Staff to ensure timely and efficient delivery of their functions (described below);
- Ensure that Approved Research Projects are scientifically and technically sound by managing a review process (when needed) for all pre-proposals and full proposals submitted to the Advisory Committee;
- In cooperation with the Advisory Committee, maintain and develop base funding, including recruitment of new members;
- Develop contacts, networks, and directs linkages with other researchers, research organizations, and funding agencies to identify and pursue opportunities for shared research funding, and as appropriate, develops agreements that leverage and compliment CFRU research activities;

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- Maintain close contact with Advisory Committee and Cooperating Organizations to communicate the latest research results, identify research needs, and examine emerging forestry issues; and
- Develop a strong relationship with CFRU Cooperating Organizations, regularly visiting their operations.

The CFRU Director will be:

- Selected from existing UMaine faculty or staff based on mutual agreement between the Advisory Committee and university administration (Director of Center for Research on Sustainable Forests and Chair/Director of prospective Director's home department);
- Appointed for a three-year term with renewal based on a performance review and approval by the Advisory Committee and university administration; and
- Compensated by a monthly stipend, summer salary, or other terms as negotiated among Advisory Committee, university administration, and prospective Director.

2) Center for Research on Sustainable Forests

The Center for Research on Sustainable Forests (CRSF) was established in July 2006 and was created in association with re-organization of the UMaine forestry faculty into a School of Forest Resources. As part of this re-organization, CFRU became part of the CRSF, which is administered by a Director who reports to the Vice President for Research. The mission of the CRSF is to *“conduct and promote leading interdisciplinary research on issues affecting the management and sustainability of northern forest ecosystems and Maine’s forest-based economy.”*

The CRSF is designed to be a center of interdisciplinary collaboration bringing UMaine faculty involved in forest resources related research together under a single “umbrella” organization. In addition to the forest resources faculty, the CFRU and Northeastern States Research Cooperative (NSRC) form the funding core of the CRSF. Activities of the CRSF also are closely coordinated with the new School of Forest Resources. The NSRC is a competitive research grants program created to support research on the 26-million acre Northern Forest which occupies the states of Maine, New Hampshire, Vermont, and New York. UMaine’s portion of NSRC includes coordinating research on forest productivity and forest products development, thus complementing the mission of CFRU. Management of NSRC occurs through the US Forest Service Northern Research Station in close coordination with forestry research institutions in New York, Vermont, New Hampshire and Maine.

3) UMaine Academic Units

Academic Units at UMaine contribute to the CFRU mission and objectives by providing faculty and/or staff that can serve as Director, Scientists, or Technical Staff where appropriate.

B. Support Staff

Support staff consists of two salaried employees that provide coordination and continuity of CFRU office and field operations. Their responsibilities are:

1) Associate Director

In association with the Director, develop and maintain a high degree of collaboration, coordination, cooperation, resource sharing, and communications among Research Team members, Support Staff, and the CRSF, including:

- Facilitating communications between CFRU Scientists, Support Staff and the CRSF to ensure appropriate coordination of research efforts;
- Organizing periodic meetings with Research Team and Support Staff to foster collaboration and efficient delivery of research programs;
- Maintaining working collaboration with CRSF researchers and staff to better utilize research resources and to serve the CFRU mission; and
- Supervise Support Staff, including some professional, classified, student and temporary employees to meet their performance targets and to ensure timely and efficient delivery of their functions to meet the needs of the CFRU program.

Manage relationships with members and external partners by maintaining close contact with Advisory Committee and Cooperating Organizations to communicate the latest research results and to identify research needs, including:

- Periodically administer the CFRU member research priorities survey to assess the needs of the membership;
- Be in regular contact with representatives from member organizations to identify their research needs;
- Present research findings to Advisory Committee members at quarterly meetings and additional venues; and
- Assess and ensure the ability of CFRU to meet the needs of the membership.

With supervision from the Director, manage all fiscal operations for the CFRU by:

- Developing and preparing annual administrative and research budgets, and presenting them to the Advisory Committee for approval;
- Tracking base and external funding sources and reporting status to Research Team and Advisory Committee in a timely fashion;

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- Seeking additional revenue streams through recruiting new members, securing external grants where appropriate, and utilizing cost-sharing opportunities for administrative and research programs; and
- Develop and manage contracts and agreements that leverage CFRU funding from cooperating organizations and funding sources.

Coordinate development and production of all internal and external communications, including by:

- Coordinating communications with all CFRU cooperators, including:
 - Manage the organization of quarterly meetings of the Advisory Committee;
 - Responding to requests for information from Cooperators regarding CFRU research and other matters;
 - Delivering oral presentations at Advisory Committee meetings, conferences, and field tours; and
 - Developing a strong relationship with CFRU cooperators, regularly visiting their field operations.
- Coordinating the design and maintenance of the CFRU web pages by:
 - Working closely with the CFRU Advisory Committee, Director, Cooperating Scientists, graduate students, and others to ensure that the web page is meeting the communications needs of the unit;
 - Ensuring information about all CFRU and its research projects is up to date; and
 - Working with UMaine technical personnel in the maintenance, troubleshooting, and development of the web site.
- Managing the regular production of CFRU publications by:
 - Designing, producing, writing, and distributing the CFRU Annual Report;
 - Designing, producing, writing, and distributing an up-to-date brochure about the CFRU;
 - Translating CFRU research into plain-language Research Notes, posters, articles, and other technology transfer outlets for CFRU;
 - Encouraging and facilitating opportunities for Cooperating Scientists to produce Research Notes and Research Reports about ongoing CFRU research projects;
 - Assisting as needed (including editing, writing, graphics preparation, desk-top publishing, typing, printing) with the production of Research Notes and Research Reports submitted by researchers; and

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- Distributing all technical publications (including annual reports, research notes, research reports, web pages, posters, and brochures) to CFRU members in a timely manner.
- Designing and implementing outreach activities that facilitate regular communications about CFRU research projects to CFRU members, other forestry professionals, policy makers, and public; including:
 - Organizing annual CFRU field tour featuring current CFRU research;
 - Developing, designing, and implementing conferences, workshops, field tours, and other meetings that feature CFRU research or other topics of interest to CFRU members; and
 - Designing poster displays for scientific and professional meetings.
 - Marketing CFRU to the public and outside organizations by creating and managing media events (e.g., newspaper, radio, television) and other public communications

Work closely with Scientists and other researchers to develop project proposals and implement Approved Research Projects that advances the mission and objectives of the CFRU by:

- Developing research proposals in conjunction with Scientists that address the research priorities of the CFRU membership by serving as Project Scientist, when appropriate;
- Staying abreast of emerging forestry issues in Maine by participating in professional organizations, statewide discussions and other events related to forestry in Maine;
- Providing technical expertise and advice related to forest management of commercial forestlands in Maine; and
- Providing technical guidance and support in experimental design and installation, and field and laboratory methods.

Maintain long-term research resources, such as research sites, facilities, and partnerships, including:

- Managing long-term CFRU research sites, including Commercial Thinning Research Network sites, Austin Pond, and Weymouth Point, and all associated agreements and partnerships;
- Manage CFRU lab and storage facilities (including safety procedures), files, equipment, supplies, and other program materials; and
- Coordinate use of CFRU vehicles, equipment, supplies, and other logistical details for approved research projects in an efficient and timely manner.

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Oversee ongoing development and maintenance of CFRU information infrastructure, including:

- Maintaining long-term storage and retrieval of data derived from all Approved Research Projects;
- Ensuring research data from all Approved Research Projects are entered, cleaned, and deposited into a data bank in a timely and efficient manner;
- Providing a system of data access for CFRU members that meets their organizational needs; and
- Work with Scientists and Support Staff to integrate long-term data from Approved Research Projects.

Other duties:

- Serve as safety officer for CFRU and approved research projects, including maintaining safety training records for employees, providing safety training opportunities, and ensuring research is conducted according to University, state and federal safety regulations.
- Other related duties as assigned.

2) Administrative Assistant

- Develop, track, and maintain annual budgets, accounts, and financial records in cooperation with Director, Associate Director, and Scientists for approval by Advisory Committee; making recommendations about account management as required.
- Prepare and present written and oral financial reports for Executive Officers and Advisory Committee.
- Coordinate all budgeting and accounting matters that arise from cross-departmental, cross-college, and multi-institutional agreements for shared funding of Approved Research Projects.
- Track acreage owned/managed and amount of wood processed by Cooperators, and processes annual contribution requests for all members.
- Coordinate all purchasing, hiring, payroll, and personnel actions for Research Team; providing interpretation of university policy as required.
- Coordinate, develop, and maintain CFRU mailing lists.
- Maintain CFRU central office, including all files, publications, equipment, supplies, and other program materials.
- Organize conferences, workshops, and other meetings as required, including preparing meeting minutes and making presentations as required.

- Assist with development and maintenance of CFRU web page.

C. Scientists

Two types of scientists are associated with CFRU:

- **Cooperating Scientists** will be selected based on their specific expertise and will be responsible for providing leadership and guidance in helping achieve the CFRU's Five-Year Objectives. Cooperating Scientists will work closely with the Director, Associate Director, Cooperating Organizations, and Support Staff to meet the overall mission and objectives of CFRU, as well as delivering Approved Research Projects in their area of expertise. Cooperating Scientists will receive compensation in the form of an annual stipend for their added responsibilities and be appointed to CFRU for up to a three-year term, with renewal based on a performance and approval by the Director, CFRU Executive Committee, and university administration.
- **Project Scientists** will be responsible only for delivering Approved Research Projects, will receive no compensation beyond that specified in project budgets, and will be affiliated with CFRU for the period during which their Approved Research Projects are funded.

Specific responsibilities and selection for both types of CFRU Scientists are as follows:

1) Cooperating Scientists

- Responsibilities:
 - In cooperation with the Director, Associate Director, and other Cooperating Scientists, ensure that the mission and objectives of the CFRU related to their specific field of expertise are accomplished in a timely, fiscally-efficient, and high-quality manner.
 - Develop a problem analysis and related research proposals that will achieve Five-Year Objectives in their field of expertise.
 - Submit regular research proposals addressing the Five-Year Objectives for funding consideration by Advisory Committee.
 - Implement Approved Research Projects, analyze data, and prepare an annual report on associated research activities.
 - Promptly report research results using regular oral presentations, field tours, web pages, articles, research notes and reports, posters, journal publications, and other appropriate forms of communication.
 - Communicate research needs and emerging issues that are relevant to the Cooperators and CFRU mission.
 - Attend and take active role in CFRU Advisory Committee meetings and field tours.

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- Maintain a high degree of collaboration, coordination, resource sharing, and communication with other members of the Research Team.
- Develop contacts, networks, and direct linkages with other researchers, research organizations, and funding agencies to identify and pursue opportunities for shared research funding in their field of expertise, working with the Director and Associate Director to develop agreements that leverage and compliment CFRU research activities.
- Develop strong relationship with CFRU member organizations, visiting their operations as needed.
- In cooperation with the Director, Associate Director, and other Scientists, select highly-qualified graduate students and technicians needed to deliver Approved Research Projects.
- Work closely with the Associate Director to coordinate field activities, technicians, vehicles, equipment, and supplies in cooperation with other Scientists.
- Supervise and coordinate graduate students and technicians to deliver approved CFRU research projects in an efficient and high-quality manner.
- Selection, Term, and Compensation:
 - Selected from existing UMaine faculty or staff (or other organizations as required) based on expertise required to achieve specific CFRU research objectives, and by mutual agreement with CFRU Director, Advisory Committee, and university administration (Chair of prospective scientist's home department).
 - Number of Cooperating Scientists on the Research Team will be determined based on research needs outlined by the Five-Year Objectives and budget constraints.
 - May be selected by competitive process based on qualifications and past productivity in relevant scientific disciplines.
 - Appointment will be a three-year term; with renewal based on performance review and approval by the CFRU Director, Advisory Committee, and appropriate university administration.
 - Compensation may include a monthly stipend, summer salary (based on time required beyond the academic year to conduct Approved Research Projects), or other terms as negotiated.
 - May have access to CFRU vehicles, equipment, and services from Support Staff for delivery of Approved Research Projects.
 - Additional funds for graduate students, technicians, travel, equipment, and supplies may be provided through budgets of Approved Research Projects that are led by Cooperating Scientists.

2) Project Scientists

- Responsibilities:

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- Submit research proposals addressing Five-Year Objectives for funding consideration by Advisory Committee.
- Implement Approved Research Projects, analyze data, and prepare an annual report on associated research activities.
- Promptly report research results using regular oral presentations, field tours, web pages, articles, research notes and reports, posters, journal publications, and other appropriate forms of communication.
- In cooperation with CFRU Director and other Scientists, select highly qualified graduate students and technicians to deliver Approved Research Projects.
- Work closely with Associate Director to coordinate field activities, technicians, vehicles, equipment, and supplies in cooperation with other Scientists.
- Supervise and coordinate graduate students and technicians to deliver Approved Research Projects in an efficient and high-quality manner.
- Selection, Term, and Compensation:
 - Selection based on having submitted and received funding from the CFRU Advisory Committee to deliver an Approved Research Project.
 - Member of the Research Team for the length of time that their Approved Research Project is funded by the CFRU.
 - May have access to CFRU vehicles, equipment, and services from Support Staff for delivery of Approved Research Projects.

D. Technical Staff

- Includes graduate students, post-doctoral fellows, technicians, or other professionals who are funded and/or work on Approved Research Projects, and are employed by the University of Maine or a collaborating organization.
- Graduate students may be funded through research assistantships; post-doctoral fellows may be fixed-term employees; technicians and other filled positions may be either fixed-term employees, temporary classified pool personnel, or student employees.
- Supervised by the Scientist leading the Approved Research Project, but are managed as part of the Research Team to ensure maximum cooperation, coordination, and resource sharing among Approved Research Projects.
- Shared funding among Approved Research Projects for Technical Support is strongly encouraged.

3. Approved Research Projects

The CFRU mission and objectives will be accomplished primarily through Approved Research Projects:

- All funding (except the administrative budget) occurs through Approved Research Projects.
- Funding for Approved Research Projects is only available through research proposals that have been approved by the Advisory Committee.
- Projects ideas are generally first submitted for approval by the Advisory Committee as short pre-proposals (format in Appendix IV).
- If a pre-proposal is approved, it can be submitted as a full proposal (format in Appendix V) for funding consideration by the Advisory Committee.
- Research pre-proposals and full proposals may be submitted by Cooperating Scientists, Project Scientists, other UMaine faculty, or researchers from External Research Organizations.
- Proposals demonstrating shared funding or leveraging with External Funding Agencies or External Research Organizations are strongly encouraged.
- Funding for projects can be approved for single or multiple years, and renewed annually by the Advisory Committee for multiple-year projects based on satisfactory performance.

4. External Research Organizations and Funding Agencies

Every effort will be made by the CFRU Director, Associate Director, and Cooperating Scientists to develop contacts, networks, and direct linkages with other researchers, research organizations, and funding agencies to identify and pursue opportunities for shared funding of research projects that are consistent with the CFRU mission and objectives. Preference for funding will be given to proposals that demonstrate collaboration, shared funding, and in-kind contributions with External Research Organizations and Funding Agencies.

RESEARCH PROJECT DEVELOPMENT, REVIEW & FUNDING PROCESS

To achieve the Five-Year Objectives established by the Advisory Committee, Scientists will submit research proposals and present updated findings on an annual basis. Figure 2 outlines the general process that will be used for the development, review, and funding of research proposals submitted to CFRU. Research proposals also may be submitted at other times of year depending on need and funding availability. However, the following process will be followed to facilitate a consistent funding and approval process:

- The Advisory Committee defines the Five-Year Objectives and research priorities for CFRU.
- Scientists and other researchers develop pre-proposals (3-pages maximum using the Pre-Proposal format in Appendix IV) that address CFRU research priorities.
- Pre-Proposals are submitted to the CFRU Director prior to the fiscal year for which funding is being requested (CFRU fiscal year is October 1 to September 30). Pre-proposals will

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generally be presented at the winter (January) Advisory Committee meeting. The Director and Associate Director will work with Scientists to help refine objectives, methods, collaborations, and shared funding opportunities for proposed projects.

- A decision to recommend development of a Pre-Proposal to become a Full Project Proposal is made by the Advisory Committee, generally at the winter (January) quarterly meetings. Pre-Proposals that are not recommended for development into Full Project Proposals are returned to Scientists with feedback about reasons for rejection. Revised Pre-Proposals may be re-submitted at a later time.
- Full Proposals (10-pages maximum using the Full Proposal format in Appendix V) are developed by Scientists and are generally presented at the spring (April) Advisory Committee meetings.
- The Director or Advisory Committee may request that Full Project proposals be sent out for external scientific review when needed.
- Decisions about funding for all Approved Research Projects during the coming fiscal year will generally be made at the April Advisory Committee meeting. Approved Research Projects will begin on October 1 of the following fiscal year unless otherwise designated.
- Scientists will submit written annual reports for each Approved Research Project to the Director by October 30 of each year for inclusion in the CFRU Annual Report. Written reports will describe details of work accomplished during the previous year and summarize any important results and management implications. Oral presentations of results also will be made as appropriate by Scientists during CFRU Advisory Committee meetings, field tours, and workshops.
- Annual reports will be used as a basis for decisions about continued funding of multi-year projects.
- Final project reports (both oral and written) will be prepared for all Approved Research Projects within six months of the final funding year. Written reports can be in the form of Research Reports or graduate student theses. Publication of results in refereed scientific journals is strongly encouraged. Oral presentation of final project reports will be presented at quarterly Advisory Committee meetings.

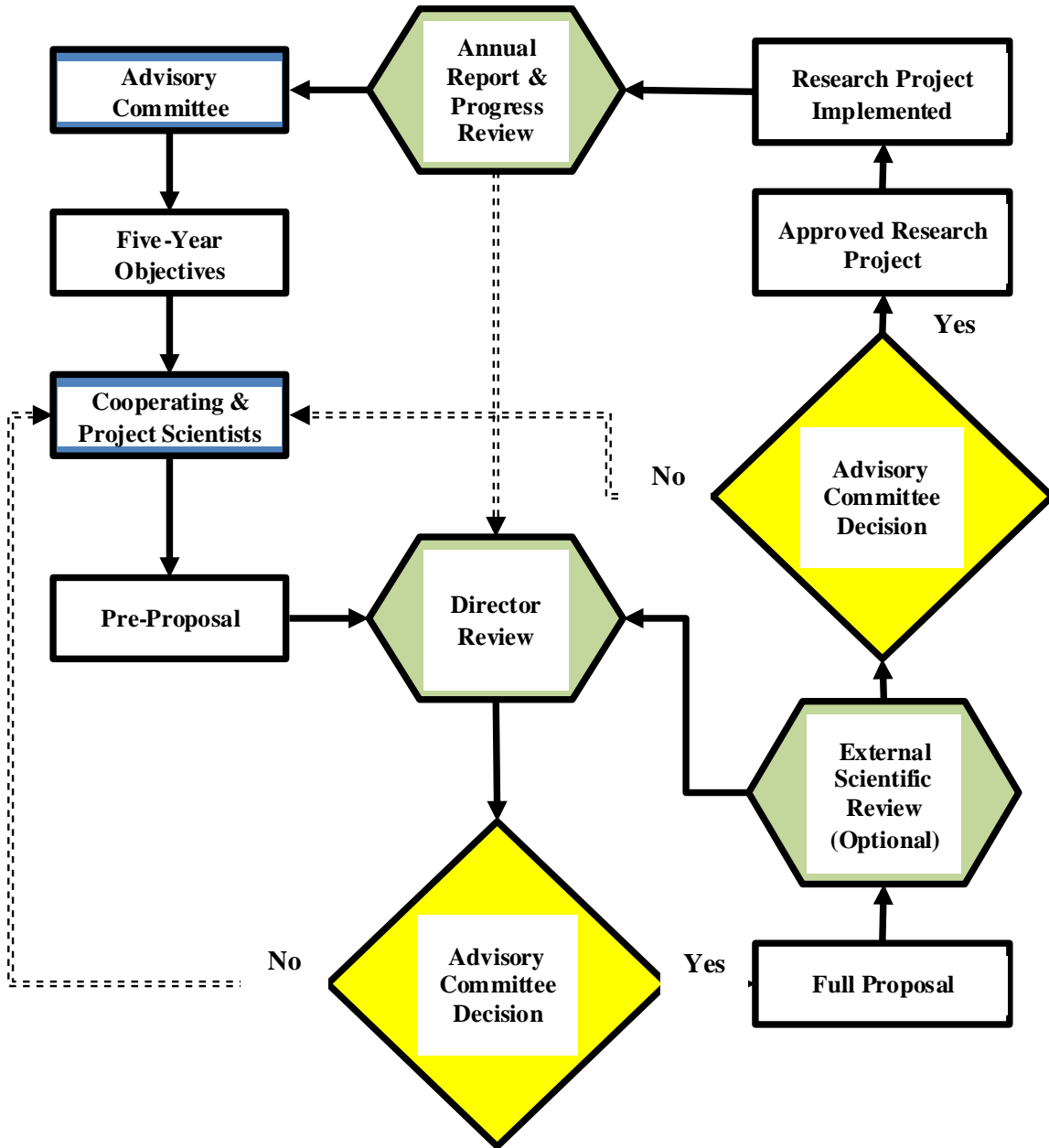


Figure 2 – CFRU research proposal and review process.

TECHNOLOGY TRANSFER & COMMUNICATIONS

1. Past Communications

Results from CFRU research have appeared in a wide range of publications over the years to ensure prompt and early reporting of important information to Cooperators. Over 475 research articles have been produced by the CFRU research since 1976.

The CFRU web page was developed in 2000 to provide CFRU members with password-protected access to all CFRU publications and other important information. Shortly after its inception, the CFRU web-page became the primary vehicle of communication with Cooperators. The CFRU web page has also been updated to enhance communication with the general public about CFRU's mission and research efforts.

In addition, quarterly Advisory meetings, workshops, and conferences have been sponsored by CFRU to rapidly disseminate research results to its members. Technical advice and recommendations to cooperators about forest management continues to be a benefit of membership and has been a hallmark of CFRU since its earliest days.

2. Communications Plan

As a cooperative effort among Cooperators, UMaine, and Scientists, the success of CFRU research relies on strong communications. The value of CFRU research can only be realized with a prompt and clear dissemination of practical information to member organizations, policy-makers, and other scientists across Maine, the Northeast, and nationally. In addition, informing members of the Maine public about the work of CFRU is important to its member organizations and UMaine. To achieve these communications objectives, CFRU communication efforts during 2011-2015 will continue to focus on the following components:

A. Meetings, Conferences and Workshops

1) Advisory Committee Meetings

Quarterly Advisory Committee Meetings will continue to be the most important form of communication between the CFRU Advisory Committee, Scientists, and the Staff. The Staff strive to make these meetings as informative, productive, and comfortable as possible. Meetings are generally held in fall (October), winter (January), and spring (April), with the option of holding a summer meeting when necessary for business. The fall meeting is generally held in conjunction with a field tour (see below).

All business may be conducted at Advisory Meetings, including reviewing Pre-Proposals and Full Proposals, project updates, final project reports, financial matters, Scientist appointments, communications, membership, etc. These meetings are organized by the Associate Director in cooperation with the Director and Chair of the Advisory Committee. Meetings are generally held in Orono at the University of Maine, although alternate venues may be used as appropriate; especially when held in conjunction with field tours.

2) Field Tours

Annual field tours have been a CFRU tradition and continue to be among the most effective and preferred means of communicating research results, research ideas, and other information among CFRU Advisory Committee members, Scientists, and staff. As the CFRU is an applied forest research organization, field tours emphasize application of CFRU research to solving forest management problems. Field tours are organized by Scientists, Staff, and invited speakers and generally include visiting current CFRU research sites, member lands, and other locations. Field tours are generally planned in conjunction with the fall Advisory meeting.

3) Workshops

CFRU workshops are held periodically to disseminate research results to frontline forest managers in Cooperating Organizations. These workshops are held every one and half to two years when a sufficient amount of new research information has been developed.

4) Conferences

Regional and national conferences held by organizations such as the Society of American Foresters (SAF) and Eastern CANUSA Forest Science Conference (ECANUSA) conferences also are important venues for CFRU Scientists to communicate the latest research results from CFRU projects. Participation in these meetings by CFRU Scientists and member organizations is an important way to stay abreast of the latest research.

B. Website

The CFRU website (<http://www.umaine.edu/cfru>) is the primary means of communication among Scientists and Staff, the Advisory Committee, Cooperating Organizations, and the public. The Public portion of the website provides general information about the mission, objectives, and a general overview of CFRU research. The password-protected *Members Only* portion of the website provides Cooperating Organizations with access to preliminary research results, research proposals, research data and maps of experimental sites, presentations, posters, meeting materials, and other materials vital to the operation of CFRU.

C. Publications

All CFRU publications are published electronically on the CFRU website (see below) and are available in print form upon request. All CFRU publications since its inception in 1975 have been digitized and are available through a search engine that is part of the publications database on the website. Preliminary research results published in Research Reports and Notes are available through password access on the CFRU web page before they are available to the general public, and is one advantage of CFRU membership. The CFRU Annual Report, Prospectus, and Spotlight articles are made available to the general public. Other publications may be made available to the general public on the web page depending the wishes of the author(s) and Advisory Committee.

1) Prospectus

Every five years, the CFRU publishes a Prospectus (this document) that details the mission, objectives, accomplishments, and organizational details that guide all CFRU operations. The CFRU Prospectus is a public document and is posted on the website.

2) Annual Reports

An Annual Report describing the accomplishments and activities of the CFRU during the previous year continues to be the principal publication of the unit. The Annual Report is a public document and is available on the website. All CFRU Annual Reports since 1975 are available on the website. Annual Reports are generally published in the first quarter of the calendar year describing accomplishments and activities from the previous fiscal year (October 1 to September 30).

3) Research Reports

Research Reports describe detailed interim or final results from Approved Research Projects. Generally five or more pages in length, Research Reports can take the form of special CFRU publications, graduate theses, or Maine Agriculture and Forest Experiment Station reports. They can be made available on either the public or members-only portion of the website depending on the topic and degree of completion, as well as approval by the author(s) and Advisory Committee.

4) Results Articles

In an effort to rapidly communicate the key messages from CFRU research to frontline foresters in Cooperating Organizations, the Results publication series was developed. Results articles concisely describe the practical applications and/or management implications from CFRU research using a one-page, plain-language format. Results articles are sent out via email to the frontline staff of all Cooperating Organizations and are made available only on the password-protected portion of the CFRU website. Supporting Research Reports and other CFRU publications with more detailed results from the same research projects are cross-referenced for those who would like to pursue additional information.

5) Refereed Journal Articles

To ensure that CFRU research meets the highest scientific standards, Scientists and Technical Staff are strongly encouraged to publish the results of CFRU-sponsored research into leading scientific journals that are refereed by scientific peers. Results from CFRU research that is published in journal articles are generally made available in CFRU Research Reports, Results articles, Annual Reports, and presentations one to several years before publication in refereed journal articles, but are distributed to members and made available on the CFRU website immediately after publication.

6) Spotlight Articles

Spotlight articles were developed from a request by Cooperating Organizations to have CFRU research presented to state legislators, policy makers, and the general public. Spotlights

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describe general the general scope and accomplishments of CFRU research in a 4 to 6 page article that is written for a general audience. Spotlight articles are mailed to Maine Legislators, and members of the Maine forestry community, and are available on the public portion of the CFRU website.

7) Brochures

Brochures providing an overview of CFRU are developed for prospective members, conference participants, interested organizations, and the public.

8) Poster Displays

Poster displays are used to promote CFRU and CFRU research at conferences, workshops, professional meetings, and other venues where people gather to discuss forest resources or research.

PROGRAM REVIEW

In order to make continual improvements and adapt to the changing needs of CFRU Cooperating Organizations, it is recognized that the CFRU organization will need to change and adapt. Thus, this Prospectus is expected to be a living document and will be revised every five years. At the end of each five-year period or at other times, the Advisory Committee may elect to conduct a formal review or audit of the accomplishments, finances, and organizational design of the CFRU. The type of review will be jointly decided by the CFRU Advisory Committee and the Director of the Center for Research on Sustainable Forests. Review teams may consist of representatives from Cooperating Organizations, members of the UMaine administration, and qualified reviewers from outside organizations. Recommendations by such review teams will be used as the basis for making modifications to the CFRU organization through revisions to the Prospectus.

APPENDICES

Appendix I – Survey Results for 2011-2015 Research Priorities

Appendix II – Advisory Committee Bylaws

Appendix III – Policies & Procedures

Appendix IV – Format for Pre-Proposals

Appendix V – Format for Full Project Proposals

Appendix I - Survey Results For 2011-2015 Research Priorities

To determine research priorities for 2011-2015, a two-stage survey was conducted of CFRU organizations through Advisory Committee members. The first-stage survey was distributed in the summer of 2011. Fifteen surveys (representing 73% of the CFRU member base) were returned and analyzed in the Fall of 2011. Using the results from the first stage, one dozen research objectives were formulated based on the research priorities identified. In the second stage survey, CFRU members were asked to rank each research objective in order of importance to their organization.

Table 1 shows the research objectives and their average ranking. Survey participants were asked to assign a unique rank to each objective (1 = Most Important, 12 = Least Important). Objectives that were not applicable to an organization were left blank. Improved commercial thinning strategies, growth and yield predictions, understanding the effects of partial harvesting, and the effects of forest management on wildlife habitat continued to be a high priority for CFRU members. New research objectives identified as important in the next five-year operating period included understanding forest operations and forest practice regulations. Of the dozen objectives ranked, the CFRU will focus on the top seven.

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Table 1 – Research objectives identified and ranked by CFRU members (1 = Extremely important to 12 = Not important). The CFRU will concentrate on the top seven objectives over the next five years.

Research Objective:	Mean rank
1. Improve knowledge about <i>COMMERCIAL THINNING STRATEGIES</i> , including: methods, timing of entry, spacing standards, prioritizing stands, and other decision-making criteria.	4.20
2. Further understanding about the effects of <i>PARTIAL HARVESTING PRACTICES</i> on regeneration, stand development, productivity, stand management, and future stand values.	5.07
3. Provide scientific data on current and emerging <i>WILDLIFE HABITAT MANAGEMENT</i> issues such as: deer wintering areas, threatened & endangered species, and others.	5.53
4. Develop and refine <i>GROWTH & YIELD MODELS</i> for Maine forests, and produce inexpensive and efficient tools for forest managers.	5.57
5. Enhance understanding about how <i>FOREST OPERATIONS</i> such as harvest methods, equipment, roads, stream crossings, and labor influence management efficiency and wood costs.	6.07
6. Utilize science-based analysis to evaluate the impact of various <i>FOREST PRACTICE REGULATIONS</i> , such as the Forest Practices Act, on forest resources, landowners, and the industry.	6.64
7. Improve understanding about <i>BIOENERGY</i> and <i>BIOREFINERIES</i> , and how biomass supply, markets, harvest methods, transportation, and related supply-chain issues could affect forest industry and sustainability in Maine.	6.67
8. Evaluate and enhance existing and potential <i>FOREST INVENTORY METHODS</i> and <i>PLANNING TOOLS</i> for forest managers.	7.00
9. Maintain a proactive approach towards understanding the potential <i>IMPACTS</i> and <i>MANAGEMENT</i> of <i>FOREST PESTS</i> such as: spruce budworm, emerald ash borer, balsam woolly adelgid, and hemlock woolly adelgid).	7.07
10. Quantify the role of Maine forests and forest industry in <i>GREENHOUSE GAS EMISSIONS</i> , <i>CARBON</i> , and <i>CLIMATE POLICY</i> in the present and future.	7.20
11. Conduct <i>ECONOMIC ANALYSES</i> for Maine's forest resources and assess new market opportunities in the present and future.	7.64
12. Increase understanding about the effectiveness, value, management, and impact of <i>VOLUNTARY CONSERVATION EFFORTS</i> such as conservation easements and forest certification in Maine.	8.47

Appendix II – Advisory Committee Bylaws

ARTICLE I – Name

The name shall be the Cooperative Forestry Research Unit (CFRU) Advisory Committee

ARTICLE II – Purpose

The CFRU Advisory Committee provides overall direction for CFRU and advise the University of Maine on all administrative matters pertaining to operation of CFRU.

ARTICLE III – Responsibilities

Responsibilities of the Advisory Committee are to:

- Define the mission, objectives, and guiding principles of CFRU.
- Maintain and periodically update the bylaws governing the Advisory Committee.
- Maintain and periodically update the CFRU Prospectus that governs administration of CFRU.
- Define the research needs and priorities for the expenditure of funds contributed by CFRU Cooperators.
- Approve appointments of CFRU Director and Cooperating Scientists.
- Develop and maintain base funding for CFRU, including recruitment of new members.
- Review all pre-proposals for research projects and recommend development of full proposals
- Review full proposals submitted to CFRU and render a decision about funding and/or in-kind support for proposed projects.
- Review and approve annual research and administration budgets presented by CFRU Director and Staff.
- Advise and assist the CFRU Director and Director of Center for Research on Sustainable Forests on all matters relating to the administration of CFRU.
- Provide assistance, as necessary, to Cooperating Scientists in implementing Approved Research Projects, identifying and securing opportunities for direct cooperation and in-kind contributions for research on cooperator lands.
- Periodically review progress of Approved Research Projects and in cooperation with CFRU Director, ensure that results from Approved Research Projects are delivered in a timely manner.

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- In cooperation with CFRU Director and Cooperating Scientists, ensure research results from Approved Research Projects are disseminated to all CFRU Cooperators in a timely and efficient manner.
- Provide CFRU Staff with contact information of forestry personnel in their organization for the purpose of disseminating CFRU research results to their forest management staff.

ARTICLE IV – Membership

The CFRU Advisory Committee will consist of:

- One representative from each member organization that contributes \$1,000 or more annually;
- One representative from the USDA Forest Service, Northern Research Station. The USFS representative will be a voting member and the USFS will not be required to make an annual financial contribution to CFRU.
- Director of Center for Research on Sustainable Forests as a non-voting member.

Each member organization shall have one vote on all matters voted on by the Advisory Committee. A member who is unable to attend a meeting may appoint an alternate representative for that meeting. The alternate may vote for the replaced member. The Chairperson will be informed, prior to the meeting, of who the alternate will be.

ARTICLE V – Officers

- 1) The officers of the CFRU Advisory Committee shall be elected by the Advisory Committee and shall include: Chairperson, Vice Chairperson, Member-at-Large, and Financial Officer.
- 2) The terms of officers shall be two years beginning on January 1 after the election.
- 3) The Vice Chairperson will serve as Chairperson after one term.
- 4) The past Chairperson will serve as Financial Officer for one term.
- 5) The Member-at-Large may be re-elected for one additional term.
- 6) The CFRU Administrative Assistant will record and publish minutes of the meeting and assist the Chairperson with correspondence as required.
- 7) Duties of the officers are as follows:

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Chairperson:

- 1) Set the date, time, and place of meetings, and work with CFRU Director and Staff to prepare and send agenda of meetings to CFRU Staff, Cooperating and Project Scientists, and Advisory Committee members in advance of meeting.
- 2) Preside over all CFRU meetings.
- 3) Coordinate Committee activities with CFRU Director.
- 4) Direct activities of subcommittees.

Vice Chairperson:

- 1) Serve in absence of Chairperson.
- 2) In coordination with CFRU Staff, promote accomplishments of CFRU to all Cooperators.
- 3) Promote and publicize CFRU accomplishments to legislators, policy makers, and general public.

Member-at-Large:

- 1) Serve as Chairperson of the Membership Subcommittee.

Financial Officer:

- 1) Work with the CFRU Director, Scientists, and Staff to develop annual budgets.
- 2) Report on financial conditions of CFRU at Advisory Committee meetings.

ARTICLE VI – Committees

The Chairperson will appoint the following committees each year:

Executive Committee:

- 1) Shall be composed of officers from the Advisory Committee, including Chairperson, Vice Chairperson, Financial Officer, Member-at-Large, and Director of the Center for Research on Sustainable Forests.
- 2) A CFRU Staff member may attend as a recorder, if so desired by Chairperson.
- 3) Shall meet at the call of the Chairperson.
- 4) In cooperation with Director of the Center for Research on Sustainable Forests and through approval of Advisory Committee, select the Director, review his/her performance, and renew

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appointments as required.

- 5) In cooperation with the CFRU Director and through approval of Advisory Committee, select Cooperating Scientists, review his/her performance, and renew appointments as required.
- 6) In cooperation with the Director of the Center for Research on Sustainable Forests, Advisory Committee, CFRU Director,, advise, assist, and approve all administrative and policy matters affecting the functioning of CFRU.
- 7) Shall present a new slate of officers (Chairperson and Member-at-Large) to the Advisory Committee for vote at the final meeting (generally the fall meeting) of a two-year term for current officers.

Membership Subcommittee:

- 1) Shall consist of three members, including the Member-at-large, who shall act as Chairperson of the Subcommittee.
- 2) Shall work with the Director and CFRU Staff in recruiting and maintaining organizations as members of CFRU.

ARTICLE VII – Meetings

The Advisory Committee will meet once a quarter during the fall, winter, and spring. The Chairperson may call a summer meeting or additional meetings as needed. A quorum of the Advisory Committee will be 51% of voting member organizations.

ARTICLE XIII – Parliamentary Procedures

The latest edition of Robert’s Rules of Order Revisited shall govern the Committee in deliberations.

ARTICLE IX – Governance

All policies, procedures, rules, guidelines, and other matters that govern the administration of CFRU shall be described in a published CFRU Prospectus that will be revised periodically by the Advisory Committee through a majority vote. The current version of the CFRU Prospectus will be made available on the public portion of the CFRU web page.

ARTICLE X – Amendments

Proposed amendments to these bylaws must be offered in writing to the Chairperson. The Chairperson must provide the proposed amendment to the full Advisory Committee membership at least two weeks before the next scheduled meeting. The Chairperson will then read the amendment for action at that meeting. Ratification of amendments shall require acceptance by

two-thirds of all voting members of the Advisory Committee.

ARTICLE XI – Additional Financial Contributions

Any Cooperator may elect to make additional financial contributions (through direct financial or in-kind contributions) to CFRU for support of individual research projects that have been approved by the Advisory Committee. These additional contributions can be used to support additional investigations or particular aspects of an Approved Research Project desired by one or more Cooperators. Additional contributions also may be sought from Cooperators when the financial requirements for proposed projects exceed the capability of CFRU to provide support from general operating funds. These solicitations will be made as part of the normal funding approval process at Advisory Committee Meetings. Any additional direct financial or in-kind contributions made by Cooperators will be considered above and beyond the Cooperator's annual contributions. The same rules and regulations that govern acceptance of annual contributions will apply to any additional financial contributions.

Appendix III – Policies & Procedures

MEMBERSHIP CATEGORIES

The CFRU offers four categories of membership for organizations and individuals wishing to support the CFRU mission and objectives. Each membership category offers different services and opportunities:

Category	Description	Services received	Annual contribution [†]
Forest Landowner / Manager	Owner or manager of commercial forestlands in the state of Maine	<ul style="list-style-type: none"> ▪ Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for landowners / managers contributing \$1,000 or more). ▪ Immediate notification to all frontline forest managers in your organization as new CFRU research notes, reports, and other materials are released. ▪ Internet password access to all CFRU publications (including research notes, full research reports, and annual reports). ▪ Quick access to CFRU scientists for technical advice and support. ▪ Participation in quarterly Advisory Committee meetings and annual field tour. ▪ Listing of your company name as a CFRU cooperator on all publications, poster displays, and web page. ▪ Opportunity to have CFRU research projects conducted on your lands. ▪ Access to CFRU databank. 	<p>Three-tiered structure based on amount forestland owned and/or managed:</p> <ul style="list-style-type: none"> ▪ \$0.0584 / A on first 1 to 500,000 A; ▪ \$0.0533 / A on next 500,001 to 1,000,000 A; and ▪ \$ 0.0508 / A for each acre >1,000,000 A. <p>(Acre calculation includes all lands and waters less acreage of water bodies ≥10 acres in size) (\$1,000 minimum)</p>

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Category	Description	Services received	Annual contribution [†]
<p>Mill owner / Wood Processor</p>	<p>Owner of pulp and paper mill or sawmill in the state of Maine that does not own or manage commercial forestland</p>	<ul style="list-style-type: none"> ▪ Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for mills contributing \$1,000 or more). ▪ Immediate notification when new CFRU research notes, reports, and other materials are released. ▪ Internet password access to all CFRU publications (including research notes, full research reports, and annual reports). ▪ Participation in quarterly Advisory Committee meetings and annual field tour. ▪ Listing of your company name as a CFRU cooperator on publications, poster displays, and web page. ▪ Access to CFRU databank. 	<p>\$0.0127 per ton of pulp, paper, and other wood products processed per year.</p> <p>(\$1,000 minimum)</p>

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Category	Description	Services received	Annual contribution [†]
Corporate	Corporation, business, or other organization that does not meet either the Forest Landowner / Manager or Mill owner / Wood Processor categories above	<ul style="list-style-type: none"> ▪ Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for members contributing \$1,000 or more). ▪ Immediate notification as new CFRU research notes, reports, and other materials are released. ▪ Internet password access to all CFRU publications (including research notes, full research reports, and annual reports). ▪ Participation in quarterly Advisory Committee meetings and annual field tour. ▪ Listing of your company name as a CFRU cooperator on publications, poster displays, and web page. <ul style="list-style-type: none"> ▪ Access to CFRU databank. 	<p>Small: \$1,000 per year if gross revenue ≤\$100,000.</p> <p>Medium: \$3,000 per year if gross revenue is \$100,001 to \$1,000,000.</p> <p>Large: \$5,000 per year if gross revenue is >\$1,000,000.</p>

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Category	Description	Services received	Annual contribution [†]
Individual	Individual person who does not meet any of the above categories	<ul style="list-style-type: none"> ▪ Immediate notification as new CFRU research notes, reports, and other materials are released. ▪ Internet password access to all CFRU publications (including research notes, full research reports, and annual reports). ▪ Participation in quarterly Advisory Committee meetings and annual field tour. ▪ Listing of your name as a CFRU sponsor on all CFRU publications, poster displays, and web page. 	\$500 per year.

All contributions are to be paid one year in advance of the fiscal year in which the funds are used. Current acres owned/managed and tons of wood products processed for landowner/managers and wood processor members, respectively, will be requested in December of each year. Contribution requests will be based on the above rates and sent to members each January. Contributions must be received no later than August 30 of each year to be counted as received for that fiscal year.

MAINTENANCE OF CFRU FUNDING BASE

Every three years (beginning in 2011) the CFRU Advisory Committee will review member contribution rates and consider adjusting them to maintain the purchasing power of CFRU. The members agree to maintain an annual base funding level for CFRU of between \$500,000 and \$600,000 (adjusted to 2011 dollars). During each three-year review of member contributions, the Advisory Committee will evaluate the status of membership and contribution rates to set an appropriate increase in contribution rate for the next three-year period. Changes in the contribution rate will be voted on at the fall Advisory Committee meeting prior to the beginning of each three-year period. [*Approved (17-0) at October 26, 2011 Advisory Committee Meeting*].

ACCOUNTING PRACTICES FOR COOPERATOR FUNDS

CFRU Cooperator dues are considered gifts to the university under a standing agreement and are maintained in a special gift account by the Office of University Development. Under this long-standing agreement, a 10% overhead is assessed on accounts that support Approved Research Projects that are conducted at the University of Maine. No overhead is assessed on funds allocated for the administration of the CFRU. All salaries and stipends of the Director, Associate Director, Cooperating Scientists, and Support Staff will be part of the administrative budget. All CFRU gift funds are held in an interest-bearing reserve account until the Advisory Committee allocates the funds through the annual approval process.

The budget proposed to the Advisory Committee for each fiscal year will be based upon the contributions received in the previous fiscal year, plus any uncommitted funds from the prior fiscal year. The CFRU fiscal year begins October 1 and ends September 30.

UNIVERSITY RESPONSIBILITIES

Program Management and Control of Operations

The CFRU is a recognized program of the University of Maine System by action of the Board of Trustees. Administration of the CFRU at the University of Maine is the responsibility of the CFRU Director, Director of the Center for Research on Sustainable Forests, and Vice President for Research. UMaine Department Chairs/School Directors of CFRU Cooperating Scientists' academic homes may provide guidance and support to their faculty based on their departmental mission and role of faculty members in CFRU research.

The CFRU Director will supervise all funds expended by CFRU and approved by the CFRU Advisory Committee. Personnel working on CFRU projects are not required to be employees of the college, university, or unit. CFRU personnel employed by UMaine will conform to all Administrative and Workers' Compensation policies of the University.

Lab and Office Space

The Center for Research on Sustainable Forests in cooperation with the College of Natural Sciences, Forestry, and Agriculture and School of Forest Resources will provide office and laboratory space without charge for the CFRU Director, Associate Director, Cooperating Scientists, and Support Staff, as well as all post-doctoral researchers, professional employees, and graduate students associated with CFRU. The College of Natural Sciences, Forestry, and Agriculture is also responsible for maintenance of the CFRU building on University Forests properties (Orono) and CFRU trailer (Telos Camp).

CFRU Vehicles

Use of CFRU vehicles will be permitted by UMaine employees for delivery of Approved Research Projects. All vehicle charges for Approved Research Projects will be included in the budget section of approved Full Research Proposal.

COOPERATOR RESPONSIBILITIES

Capital Equipment

Purchases of capital equipment exceeding \$5,000 and all vehicles will require approval of the CFRU Executive Committee.

Cooperator Mailing List

To maintain an updated contact list for all CFRU communications, a representative from each member organization will annually review the mailing lists for personnel in their organization. Current names, mailing addresses, email addresses, phone numbers, and fax numbers are to be provided to the CFRU Associate Director at Advisory Committee Meetings,

Appendix IV – Format for Pre-Proposals
COOPERATIVE FORESTRY RESEARCH UNIT
PRE-PROPOSAL
(Maximum of 3 pages)

PROJECT TITLE: *Brief and descriptive title.*

PRINCIPAL INVESTIGATOR:

Person responsible for leading and delivering project.

Name: Organization: Phone: Email:

CO-PRINCIPAL INVESTIGATORS:

Name: Organization: Phone: Email:

POTENTIAL COOPERATING CFRU MEMBERS OR OTHER RESEARCH ORGANIZATIONS: *(if any)*

Name: Organization:

PROJECT OBJECTIVES:

Briefly describe, in bullet form, objectives to be accomplished.

BACKGROUND:

Briefly describe problem and its importance, previous work completed, and why this project is important.

APPROACH:

Briefly describe the experimental approach that would be taken. Do not include a lot of detail, just the general approach that would be used.

ANTICIPATED BENEFITS TO CFRU MEMBERS:

Briefly describe how the above project objectives meet the stated mission and objectives of CFRU.

APPROXIMATE LENGTH OF STUDY: *years*

ESTIMATED AMOUNT REQUESTED FROM CFRU:

Estimate total amount likely to be requested and over how many years.

MATCHING FUNDS:

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List sources and approximate amounts of other funding sources supporting or likely to support this project.

DELIVERABLES:

Briefly list products/outputs expected from project.

Appendix V – Format for Full Proposals
COOPERATIVE FORESTRY RESEARCH UNIT
FULL RESEARCH PROPOSAL
(Maximum of 10 pages plus CV and appendices)

PROJECT TITLE: *include brief and descriptive title.*

ABSTRACT:

Briefly describe the objectives of the project, the benefit to CFRU members, and the products that will be delivered (limit to 200 words).

PRINCIPAL INVESTIGATOR:

Person responsible for leading and delivering project.

Name: Organization: Phone: Email:

CO-PRINCIPAL INVESTIGATORS:

Name: Organization: Phone: Email:

COOPERATING CFRU MEMBERS OR OTHER RESEARCH ORGANIZATIONS:

Name: Organization:

OTHER RESEARCHERS, STUDENTS, & PROFESSIONALS: *(if any)*

Name: Organization:

NAME & ADDRESS OF PRINCIPAL RESEARCH ESTABLISHMENT

(For Non-UMaine organizations only)

Contract Representative: Organization: Phone: Email:

PLANNED START DATE: *month and year*

PLANNED END DATE: *month and year*

AMOUNT APPLIED FOR FROM CFRU:

Include total amount requested over how many years.

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STATEMENT OF AUTHORIZATION SIGNED AND DATED BY AN AUTHORIZED REPRESENTATIVE OF THE RESEARCH ESTABLISHMENT:

Include names, titles, and signatures of administrators responsible for approving research proposals (required only for organizations external to UMaine).

BACKGROUND:

Briefly describe problem and previous research in the field (including key literature citations) that has addressed the problem.

PROJECT OBJECTIVES:

Describe, in bullet form, specifically what objectives are to be accomplished by the proposed research project.

EXPERIMENTAL DESIGN:

Include brief description of the site requirements (if any), experimental design (including experimental and sampling units), treatments, sampling methodology, and variables to be measured. If phases or stages are required, describe the sequence of events and relation of each.

ANALYTICAL APPROACH:

Briefly describe the statistical methods and analytical procedures that will be used to test hypotheses, as well as how they will achieve stated objectives.

ANTICIPATED BENEFITS TO THE CFRU:

Briefly describe how the above project objectives meet the stated mission and objectives of the CFRU, including the probable magnitude of impact if project is successful and if not undertaken.

SCHEDULE OF DELIVERABLES:

Include list of measurable outputs to be delivered to the CFRU from this work, including likely publications, presentations, products, etc. with the date of delivery for each item.

Deliverables

Date

COMMUNICATIONS PLAN:

Briefly describe how research results will be communicated to CFRU and scientific community. The following must be included:

- *Written annual reports are required by November 1 of each year, a summary of which will be published in the CFRU Annual Report.*
- *Oral progress reports will be presented at CFRU Advisory Committee meetings, scientific conferences, and other appropriate meetings, written progress reports will be due by August 1 prior to funding renewal for multi-year projects.*
- *Interim results via CFRU 1-2 page Research Notes are strongly encouraged.*
- *A final report is required within 6 months of project termination. This report may be in the form of a research report, thesis/dissertation, or published journal article.*

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- All data produced from the project, if CFRU is the principal funding source, will be deposited into the CFRU databank according to required specifications.
- It is the responsibility of the researcher(s) to publish final results in the peer-reviewed scientific literature.
- List potential publications (titles, authors, and outlets).

BUDGET

- Show budget for each fiscal year (October 1 to September 30).
- Multi-year projects are acceptable, but funding is approved annually by CFRU Advisory Committee depending on funding availability and evaluation of previous year's performance.
- Projects should generally be less than 3 years, and must not exceed 5 years in length.
- Show budget for entire project even if funding is shared by other sources.
- Show financial and in-kind contributions from all funding sources.
- The following format should be used:

Item	Year 1	Year 2	Year 3	TOTAL
Professional & technical staff:				
Salary				
Fringe benefits				
Graduate students:				
Stipends				
Insurance				
Tuition				
Travel				
Equipment				
Supplies				
SUBTOTAL				
Overhead (10% overhead required if work is conducted at UMaine. No more than 10% overhead will be paid to organizations external to UMaine)				
TOTAL COST				
Leveraged Funds:				
Organization 1				
Organization 2, etc.				
TOTAL LEVERAGED FUNDS				
Amount requested from CFRU				
% of total project cost requested from CFRU				

LITERATURE CITED:

Include any literature citations used above.

RESUME OF PRINCIPAL AND CO-PRINCIPAL INVESTIGATORS:

Maximum of 5 pages for each PI and Co-PI showing relevant work from past 5 years.

APPENDICES:

Up to 10 pages of additional documentation in support of the project - if necessary.