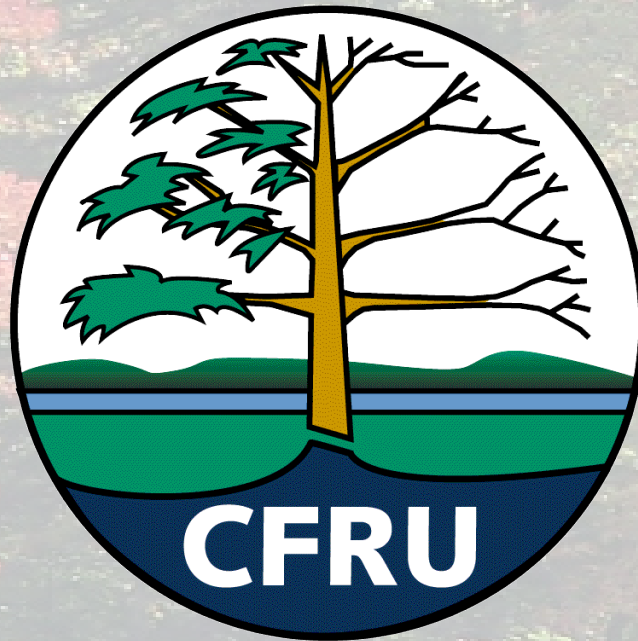


# Cooperative Forestry Research Unit

## Prospectus 2006-2010



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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. Thirty 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 26 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 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 2006-2010 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. Maine is the most heavily forested state in the nation (90%) 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 2001). Thus, Maine forests have been the backbone of the State's industrial economy as well as the tourist and recreational industry, contributing direct goods and services valued at more than \$6 billion annually with a total economic impact of nearly \$10 billion and total employment for 76,000 people.

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 1970s, 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 2006 to 2010.

## ACCOMPLISHMENTS BASED ON THE 2000-2005 PROSPECTUS

The CFRU publishes an annual report that provides members with a detailed description of progress made on projects approved by the Advisory Committee. Six annual reports were published from 2000 to 2005 that documented CFRU accomplishments toward the goals and objectives identified from a 1999 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](http://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 2000-2005 objective:

1. *Improve strategies for commercial thinning, including a better understanding of growth and yield responses to thinning, optimum timing of stand entry, appropriate spacing standards, criteria for prioritizing stands, and other decision-making criteria.*

- A Commercial Thinning Research Network (CTRN) was established in 2000 that includes two long-term studies to address the most important questions about commercial thinning in spruce-fir stands. The two studies include 12 sites across the state with over 12,000 tagged trees. CTRN accomplishments include:
  - A regional conference on Thinning in the Maine Forest informed CFRU members about the state-of-the-art in forest thinning.
  - Interim guidelines for commercial thinning in spruce-fir stands was developed using a new graphical approach through a model called ThinME.
  - Five years of post-thinning growth responses were measured on the two commercial thinning studies.
  - A web-based establishment report was developed to track progress of the CTRN.
  - Long-term responses of CTRN plots to commercial thinning were projected using the USFS Forest Vegetation Simulator.
  - Two studies examined how leaf area could be used to predict stand growth and density relationships following commercial thinning.
  - Factors affecting regeneration of red spruce and balsam fir following commercial thinning were examined.
  - A spatial analysis of trees following thinning examined how growing space

was reallocated following different methods of commercial thinning.

- Physiological stresses in balsam fir and red spruce following commercial thinning was studied.
  - Long-term stand responses and financial returns to precommercial thinning and herbicide spraying were documented in a re-measurement of the Austin Pond Study.
  - Nitrogen fertilization of spruce-fir stands was found to substantially increase growth and provide good financial returns if applied about ten years after precommercial thinning and when stands are near crown closure.
  - A study examining damage to root systems following precommercial thinning in spruce-fir stands found that it was not a serious problem.
2. *Increase information about the influence of forest management practices on water quality, including the effects of buffer strips on watershed protection and wood production.*
- A comprehensive literature review was completed about the effects of forest management practices on riparian and in-stream animal biota of North America.
  - A controlled experiment on 15 headwater streams in western Maine provided much needed data on the effect of buffer strip width on water temperature, water chemistry, and aquatic biodiversity.
3. *Provide better growth and yield models for conifer, hardwood, and mixedwood stands.*
- A wood supply analysis was conducted to analyze silviculture research priorities using a model of Maine's future wood supply.
  - The ThinME model was developed to provide a new graphical approach for commercial thinning in spruce-fir stands.

- The SPOT (Stand Product Optimization Tool) computer program was developed to optimize product recovery and financial value during harvest operations.
  - The USFS Forest Vegetation Simulator was evaluated for its ability to predict stand responses to commercial thinning.
  - CFRU collaborated with the province of Nova Scotia to develop the first hardwood growth and yield module for the GNY stand simulator.
4. *Improve silviculture for hardwood stands, especially methods that increase the regeneration success of high value tree species.*
- A Hardwood Silviculture Research Advisory Subcommittee was developed to guide research that could improve management of Maine's hardwood resource.
  - A bibliography and a series of five review papers were completed that provide forest managers with a state-of-the-art review about managing vegetation to improve the quality and abundance of regeneration in hardwood stands.
5. *Increase understanding about the effects of forestry practices on wildlife, biodiversity, and landscapes, with special emphasis on wildlife species that are of strong public concern.*
- Marten habitat requirements were used to develop a tool for landscape-scale planning in northern Maine.
  - The value of retaining unharvested patches for maintaining biodiversity in clearcuts and partially harvested stands was documented.
  - A study on the effects of precommercial thinning on snowshoe hare and other small mammals documented the compatibility of early silvicultural treatments with prey availability for Canada lynx.
  - A study on the influence of forest practices on habitat selection and movements of Canada lynx documented the compatibility of past and current harvesting methods on future lynx habitat.
- Practical indices of biodiversity were developed to help landowners manage for late-successional, early-successional, and riparian zone habitats.
  - Marten and lynx habitat requirements identified from previous CFRU research were used to develop an umbrella species approach for protecting most forest wildlife species.
6. *Improve understanding about public perceptions and attitudes about forest management, including developing better ways to communicate and resolve conflict with the public about important forestry issues.*
- A communications plan for CFRU research results was developed and implemented that included:
    - A new website designed to clearly communicate with the public about CFRU research.
    - A new series of *Spotlight* articles designed for legislators, policy makers, media, and the public that provide an overview of CFRU research.
    - A new format for CFRU Annual Reports.
    - A new series of one-page *Results* articles to quickly communicate practical results from CFRU research to forest managers.
    - A new web-based search engine that allows access to 30 years of CFRU publications.
  - Supported development of a textbook about martens and fishers summarizing results of CFRU and other research.
  - Supported development of the biennial Eastern CANUSA Forest Science Conference.

- Conducted a wide variety of field tours, conferences, and workshops highlighting CFRU and other relevant forest research results from across the region.
7. *Other research projects identified by CFRU members and staff during 2000-2005.*
- Conducted a study on the seasonal tolerance of red spruce and balsam fir to glyphosate, imazapyr, and triclopyr herbicides that resulted in changing the use of imazapyr in conifer release treatments.
  - Initiated a study about the ecology and silviculture of white cedar.
  - Completed a study on the juvenility and rooting potential of basal stem sprouts from heavily pruned hybrid larch trees.

## MISSION

The mission of the CFRU for 2006-2010 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 2004-2005 survey of CFRU member organizations about their research priorities for 2006-2010 (see [Appendix I](#)), the objectives of CFRU research will be to:

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.
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.
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.
4. Increase understanding about **riparian zone management**, including the effects of harvesting practices on water quality and buffer strip requirements.
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.
6. Improve methods for **managing for wildlife habitat**, including:
  - identifying landscape-level habitat requirements for important wildlife species,
  - understanding the effect of forest management on wildlife habitat, and
  - determining optimum snag, coarse woody debris, and retention tree characteristics for maintaining stand-level wildlife habitat.
7. Improve **silvicultural strategies for young, naturally regenerated stands**, especially improving the regeneration of softwood species in mixedwood stands.
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.

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 priority 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. External scientific review of proposals and published works is a vital part of ensuring that the highest standards are achieved.
- 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 peer-reviewed scientific journals.
- Since success of the CFRU relies heavily on the collaboration 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, and relationships among components follows.

## 1. Cooperating Organizations

The CFRU serves the applied research needs of its member organizations which include 1) forest land-owners 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 member. Representation on and

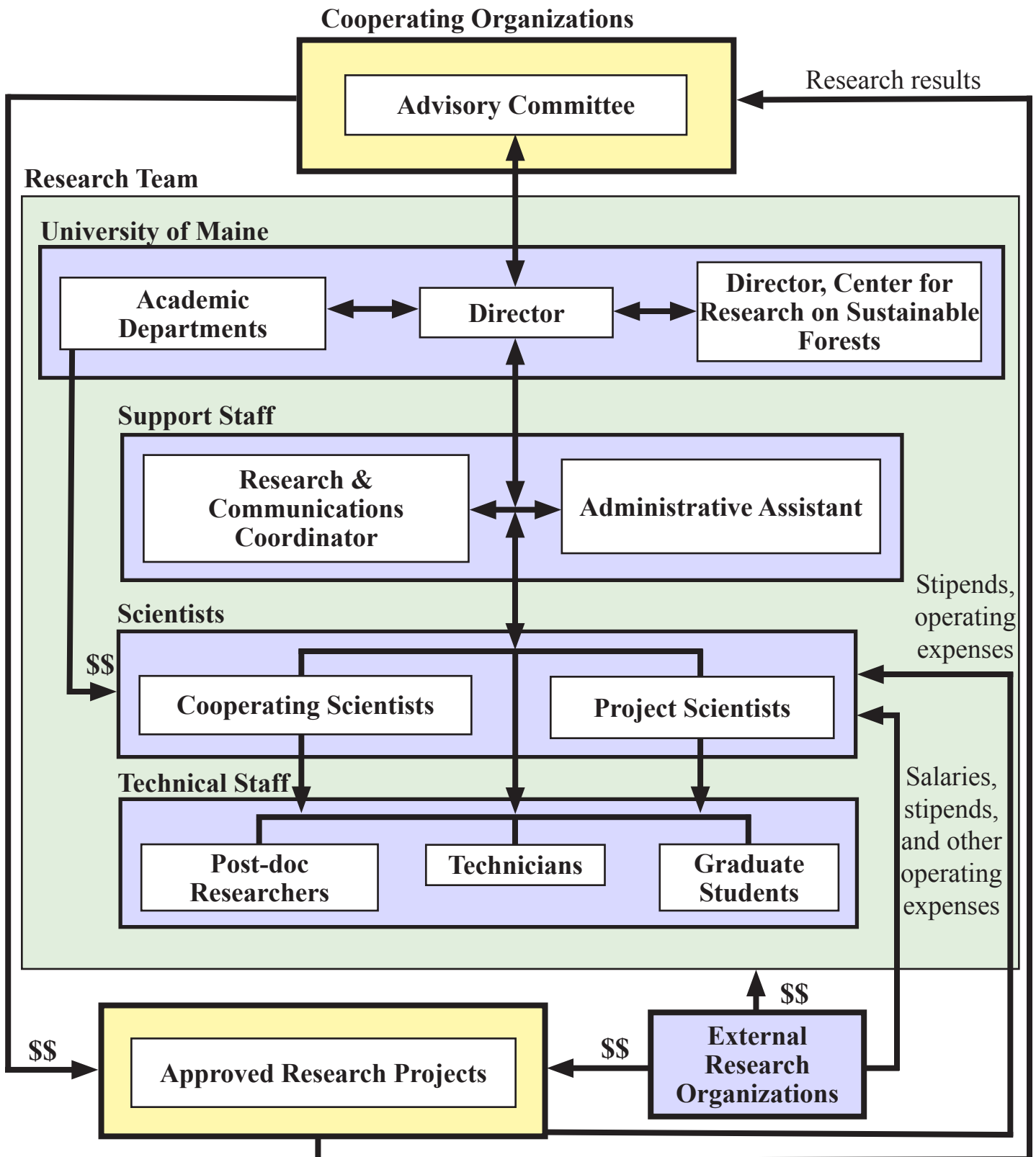
rules governing the Advisory Committee are described in the Bylaws (see [Appendix II](#)) and Policies and Procedures (see [Appendix III](#)). The function of the Advisory Committee is to:

- 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 member organizations.

## 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 the CFRU as set by the Advisory

Figure 1: CFRU Organizational Structure



Committee through Approved Research Projects. The Research Team consists of Director, Scientists, Support Staff, and Technical Staff.

### A. University of Maine

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

#### i. CFRU Director

The CFRU is led by a Director that will:

- 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 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, 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 for all

research 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 direct linkages with other researchers, research organizations, and funding agencies to identify and pursue opportunities for shared research funding, and as appropriate, develop agreements that leverage and complement CFRU research activities,
- 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 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.

#### ii. 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 each of the four Northern Forest states.

### iii. UMaine Academic Units

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

#### B. Support Staff

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

##### i. Research and Communications Coordinator

Coordinate all field and the laboratory research activities for the CFRU, including:

- manage all field and laboratory activities of technical support staff for approved research projects,
- manage long-term CFRU research sites (including Commercial Thinning Research Network sites, Austin Pond, and Weymouth Point),
- serve as Safety Coordinator to ensure that university safety policies and procedures are followed on CFRU research projects,
- ensure a high degree of collaboration, coordination, resource sharing, and communication among research team members,
- provide technical guidance and support in experimental design and installation, and field and laboratory methods,
- conduct statistical analyses of data for approved research projects for research team members,
- supervise students and other employees working on CFRU research, and ensuring that all employees are trained and follow university safety policies and procedures,
- develop new project proposals, and
- provide technical expertise and advice related to silviculture of industrial forestlands in Maine.

Manage the long-term database for all CFRU research projects, including:

- develop and maintain a database management system for the long-term storage and retrieval of data derived from all approved research projects,
- ensure research data from all approved research projects are entered, cleaned, and deposited into a database management system in a timely and efficient manner, and
- provide a system of database access for CFRU members that meets their organizational needs.

Coordinate all communications and technology transfer activities for the CFRU, including:

- Coordinate communications with all CFRU cooperators, including:
  - organize quarterly meetings of the Advisory Committee,
  - respond to requests for information from Cooperators regarding CFRU research and other matters,
  - deliver oral presentations at Advisory Committee meetings, conferences, and field tours,
  - develop a strong relationship with CFRU cooperators, regularly visiting their field operations, and
  - in cooperation with Director, develop and implement a strategy for maintaining and increasing membership and funding of the CFRU.
- Coordinate the design and maintenance of the CFRU web pages, including:
  - work 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,
  - ensure information about CFRU and its research projects are up to date, and
  - work with the University Webmaster and other technical personnel in the maintenance, troubleshooting, and development of the web site.
- Manage the regular production of CFRU publications, including:
  - Design, produce, write, and distribute the CFRU Annual Report,
  - design, produce, write, and distribute an up-to-date brochure about the CFRU,

- encourage and facilitate opportunities for Cooperating Scientists to produce Research Notes and Research Reports about ongoing CFRU research projects,
- assist 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
- distribute all technical publications (including annual reports, research notes, research reports, web pages, posters, and brochures) to CFRU members in a timely manner.
- Design and implement outreach activities that facilitate regular communications about CFRU research projects to CFRU members, other forestry professionals, policy makers, and the public, including:
  - design annual CFRU field tour featuring current CFRU research,
  - develop, design and implement conferences, workshops, field tours, and other meetings that feature CFRU research or other topics of interest to CFRU members, and
  - design poster displays for scientific and professional meetings.
- Market the CFRU to the public and outside organizations by creating and managing media events (e.g., newspaper, radio, television) and other public communications.

Other duties:

- manage CFRU lab and storage facilities (including safety procedures), files, equipment, supplies, and other program materials,
- coordinate all CFRU vehicles, equipment, supplies, and other logistical details for approved research projects in an efficient and timely manner,

- review research proposals and approved research projects for appropriate expenditures, and recommend other efficiencies, and
- other reasonably related duties as assigned.

## ii. Administrative Assistant

Responsibilities are to:

- develop, track, and maintain annual budgets, accounts, and financial records in cooperation with 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 by Cooperators and process invoices for members,
- review proposed budgets of research proposals and Approved Research Projects for appropriate expenditures, and provide recommendations for cost-sharing among projects and recommending other efficiencies,
- coordinate all purchasing, hiring, payroll, and personnel actions for Research Team; provide 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,
- edit research reports, articles, and other technical publications as required,
- organize conferences, workshops, and other meetings as required, including preparing

meeting minutes and making presentations as required, and

- assist with development and maintenance of CFRU web pages.

## C. Scientists

Two types of scientists are associated with the CFRU. **Cooperating Scientists** will be selected based on their specific expertise and will provide leadership and guidance in helping achieve the CFRU's Five-Year Objectives. Cooperating Scientists will work closely with the Director, Cooperating Organizations, and Support Staff to meet the overall CFRU mission and objectives, as well as deliver Approved Research Projects in their area of expertise. Cooperating Scientists will receive compensation for their added responsibilities and be appointed to the CFRU for specific periods of time. **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 research projects are funded.

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

### i. Cooperating Scientists

Responsibilities are to:

- in cooperation with the 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 and submit research proposals that will achieve Five-Year Objectives in their field of expertise,
- 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 the CFRU mission,
- attend and take an active role in CFRU Advisory Committee meetings and field tours,
- 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 to develop agreements that leverage and complement CFRU research activities,
- develop strong relationships with CFRU member organizations, visiting their operations as needed,
- in cooperation with the Director and other Scientists, select highly-qualified graduate students and technicians needed to deliver Approved Research Projects,
- work closely with the Research and Communications Coordinator to coordinate field activities, technicians, vehicles, equipment, and supplies in cooperation with other Scientists, and
- supervise graduate students and technicians to deliver approved CFRU research projects in an efficient and high quality manner.

#### Selection, Term, and Compensation:

- selected from existing University of Maine 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 (Director of Center for Research on Sustainable Forests and 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 may be for 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, and
- 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.

#### ii. Project Scientists

Responsibilities are to:

- 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 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 the Research and Communications Coordinator to coordinate field activities, technicians, vehicles, equipment, and supplies in cooperation with other Scientists, and
- supervise graduate students and technicians to deliver approved CFRU 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, and
- 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 UMaine or a collaborating organization,
- graduate students may be funded through assistantships; post-doctoral fellows may be fixed-term full-time employees; technicians and other filled positions may be either fixed-term full-time 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, and
- 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. Attributes include:

- 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,
- project ideas are first submitted to the Advisory Committee for approval as 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, and
- 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, and
- 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 and funding availability.

#### 4. External Research Organizations and Funding Agencies

Every effort will be made by the CFRU 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, AND 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:

- The Advisory Committee defines the Five-Year Objectives and research priorities for the CFRU.
- Scientists and other researchers develop pre-proposals (three-page 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 (generally September to December) for which funding is being requested (CFRU fiscal year is October 1 to September 30). The Director will work with Scientists to help refine objectives, methods, collaborations, and shared funding opportunities for proposed projects.

- The CFRU Director recommends submission of Pre-Proposal for consideration by the Advisory Committee at quarterly meetings.
- A decision to recommend development of a Full Project Proposal is made by the Advisory Committee at the fall or winter 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-page maximum using the Full Proposal format in [Appendix V](#)) are developed by Scientists from accepted pre-proposals.
- Full Proposals are submitted to the Director several weeks before the spring Advisory Committee meeting. The Director or Advisory Committee will determine whether a Full Project proposals needs to be sent out for external scientific review.
- Decisions about funding for all Approved Research Projects during the coming fiscal year will be made at the spring 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 multiple-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.

## TECHNOLOGY TRANSFER & COMMUNICATIONS

### 1. Past Communications

Results from CFRU research over the years have been reported in a wide range of publications 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 Cooperating Organizations 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 members. The CFRU web page has also been updated to enhance communication about CFRU's mission and research efforts with the general public.

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 the organization since its earliest days.

### 2. Communications Plan

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 the Maine public about the work of CFRU is important to Cooperating Organizations and UMaine. To achieve these objectives, CFRU communication efforts during 2006-2010 will focus on the following components:

#### A. Meetings, Conferences and Workshops

##### i. 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 strives to make these meetings as informative, productive, and comfortable as possible. They are generally held in fall, winter, and spring, with the option of holding a summer meeting when necessary for business.

All business will be conducted at Advisory Committee 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 Support Staff 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, when held in conjunction with field tours.

##### ii. 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. Since the CFRU is an applied forest research organization, field tours emphasize application of CFRU research to solve 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.

### iii. Workshops

CFRU workshops are held periodically to disseminate research results to frontline forest managers in Cooperating Organizations. These workshops generally are held every 18 to 24 months when a sufficient amount of new research information has been developed.

### iv. Conferences

Regional and national conferences held by organizations such as the Society of American Foresters (SAF) and Eastern CANUSA Forest Science Conference (ECANUSA) 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 are 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 between Scientists, 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 an advantage of CFRU membership. The CFRU Annual Report, Prospectus, *Spotlight* articles, graduate theses, and journal articles are made available to the general public.

## D. 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.

## E. 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).

## F. 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.

## G. 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.

#### **H. 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 in leading refereed scientific journals. 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 also distributed to members and made available on the CFRU website immediately after publication.

#### **I. 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* describe the general scope and accomplishments of CFRU research in a four- to six-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.

#### **J. Brochures**

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

#### **K. Poster Displays**

Poster displays are used to promote CFRU at conferences, workshops, professional meetings, and other

venues where people gather to discuss Maine forest resources or forest 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 2006-2010 Research Priorities**

**Appendix II – Advisory Committee Bylaws**

**Appendix III – Policies and Procedures**

**Appendix IV – Format for Pre-Proposals**

**Appendix V – Format for Full Project Proposals**

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**Appendix I – Survey Results for 2006-2010 Research Priorities****SURVEY RESULTS FOR  
2006-2010 RESEARCH PRIORITIES**

To determine research priorities for 2006-2010, a survey was conducted of CFRU organizations through Advisory Committee members. The survey was distributed in late December 2004. Fourteen surveys (representing 97% of CFRU dues base) were returned and analyzed in early 2005. During preparation of this prospectus, the survey was updated with the responses of new CFRU members obtained during 2005-06. The survey included sections rating the: (1) importance of 96 research topics in 12 subject areas, (2) priorities for development of computer-based software tools, and 3) preferred methods of technology transfer for CFRU research.

Table 1 shows the top 30 rated research topics in the survey. Table 2 summarizes the ranking, frequency, and a priority index (importance x occurrence) for these top 30 research topics when grouped by research category. Improving growth and yield predictions for natural stands was the highest research priority, being identified in eight of the top 30 research topics and receiving the highest importance rating. Improved commercial thinning strategies received the second highest importance rating. Understanding the effect of and developing better methods for partial cutting, managing for biodiversity, and managing for wildlife habitat were each included in four of the top 30 research priorities, and received similar importance ratings. Improved riparian zone management, intensive management of young stands, and hardwood silviculture were ranked as next most important.

Development of software to analyze the effects of forest management on growth and yield was rated as most important among the options for developing computer-based tools (Figure I.1). Software to optimize the financial value from forest stands and wood processing costs were rated as second in importance. Software tools for quantifying the effects of forest management on wildlife habitat were also rated as important.

CFRU member preferences for receiving research results from CFRU studies are shown in Figure I.2. The methods for information transfer that CFRU members indicated that they would use most often were web-based short research notes, publications search engine, and information summaries. Field tours also were regarded as among the best methods for learning about research results. Other methods for information transfer would be used only rarely to occasionally.

Table 1: Top 30 research topics identified by CFRU members and mean importance value (1 = Not important to 5 = Extremely important).	
Research topic	Mean importance value
Growth & yield responses from commercial thinning	4.17
Commercial thinning strategies - including timing of entry, spacing standards, prioritizing stands, and other decision-making criteria for: spruce-fir stands	4.11
Growth & yield implications of various harvesting systems	3.97
Growth & yield tables or models for native hardwood species	3.94
Growth & yield tables or models for natural mixedwood stands	3.89
Improved harvesting machines for partial cutting systems	3.86
Growth & yield tables or models for native conifer species	3.83
Effects of damage to residual stands from partial cutting and ways to minimize damage	3.83
Silvicultural strategies for intensive management of young, naturally-regenerated, conifer-hardwood stands	3.78
Determining costs associated with managing for late-successional features in managed forests	3.78
Commercial thinning strategies - including timing of entry, spacing standards, prioritizing stands, and other decision-making criteria for mixedwood stands	3.75
Identification of any special habitat requirements or management concerns of wildlife species of particular importance	3.69
Effects of harvesting practices on water quality	3.67
Effects of forest management on landscape patterns and implications for wildlife	3.67
Riparian zone management and buffer strips requirements	3.64
Stand responses (in-growth and regeneration) to partial cutting	3.64
Developing landscape planning tools for managing biodiversity	3.64
Developing methods for enhancing ecological value through partial harvesting including thinning, shelterwood, and selection silviculture	3.64
Effective intermediate treatments for young, even-aged stands of northern hardwoods to improve species composition, stem quality, growth, and shorten sawlog rotations	3.62



<b>Research topic</b>	<b>Mean importance value</b>
Improved silvicultural strategies for growing and maintaining quality northern hardwoods as an integral component of mixedwood stands	3.62
Growth & yield responses from pre-commercial thinning	3.61
Developing improved methods for forest inventory	3.58
Optimum snag, coarse woody debris, and retention tree characteristics for maintenance of wildlife habitat	3.58
Developing a scoring system for quantifying ecological value in partially harvested stands	3.56
Understanding about how forestry practices affect wildlife habitat and biodiversity	3.53
Commercial thinning strategies - including timing of entry, spacing standards, prioritizing stands, and other decision-making criteria for hardwood stands	3.50
Better forwarder and processor trail designs	3.47
Improved methods for reducing beech and other competing vegetation in hardwood stands	3.44
Testing and developing new or existing forest inventory systems	3.42
Strategies for maximizing softwood regeneration in mixedwood stands	3.42

Table 2: Mean importance, number of times topic occurred, and priority index (importance × occurrence) for research categories derived from top 30 research topics identified by CFRU members.

<b>Research category</b>	<b>Mean importance value <sup>1</sup></b>	<b>Number of times topic occurred</b>	<b>Priority index</b>
Improved growth and yield prediction for natural stands	3.80	8	30.42
Improved commercial thinning strategies	3.79	3	11.36
Understanding effects and better methods of partial cutting	3.70	4	14.81
Improved riparian zone management	3.65	2	7.31
Managing for biodiversity	3.65	4	14.61
Managing for wildlife habitat	3.62	4	14.47
Intensive management of young, natural stands	3.60	2	7.19
Improved hardwood silviculture	3.56	3	10.68
<sup>1</sup> 1 = Not important, 5 = Extremely important			

Figure I.1: Mean importance of computer-based software tools as ranked by CFRU.

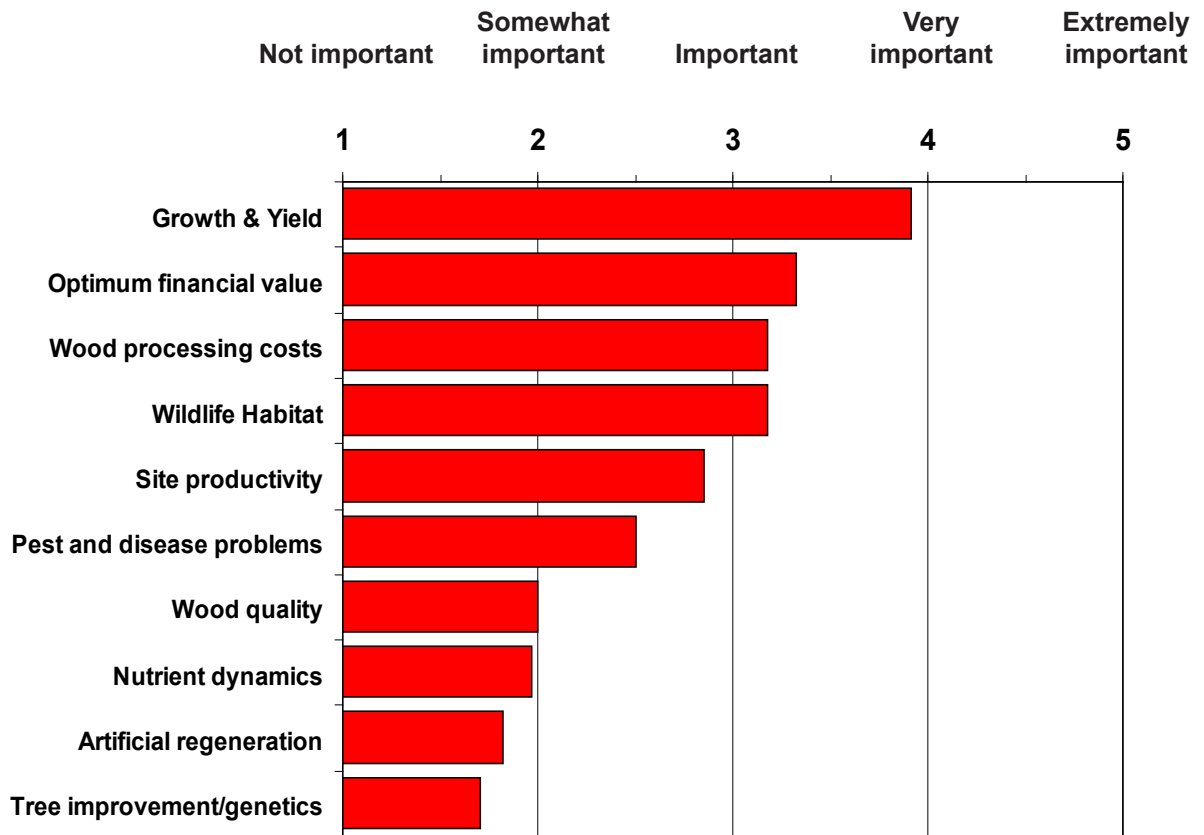
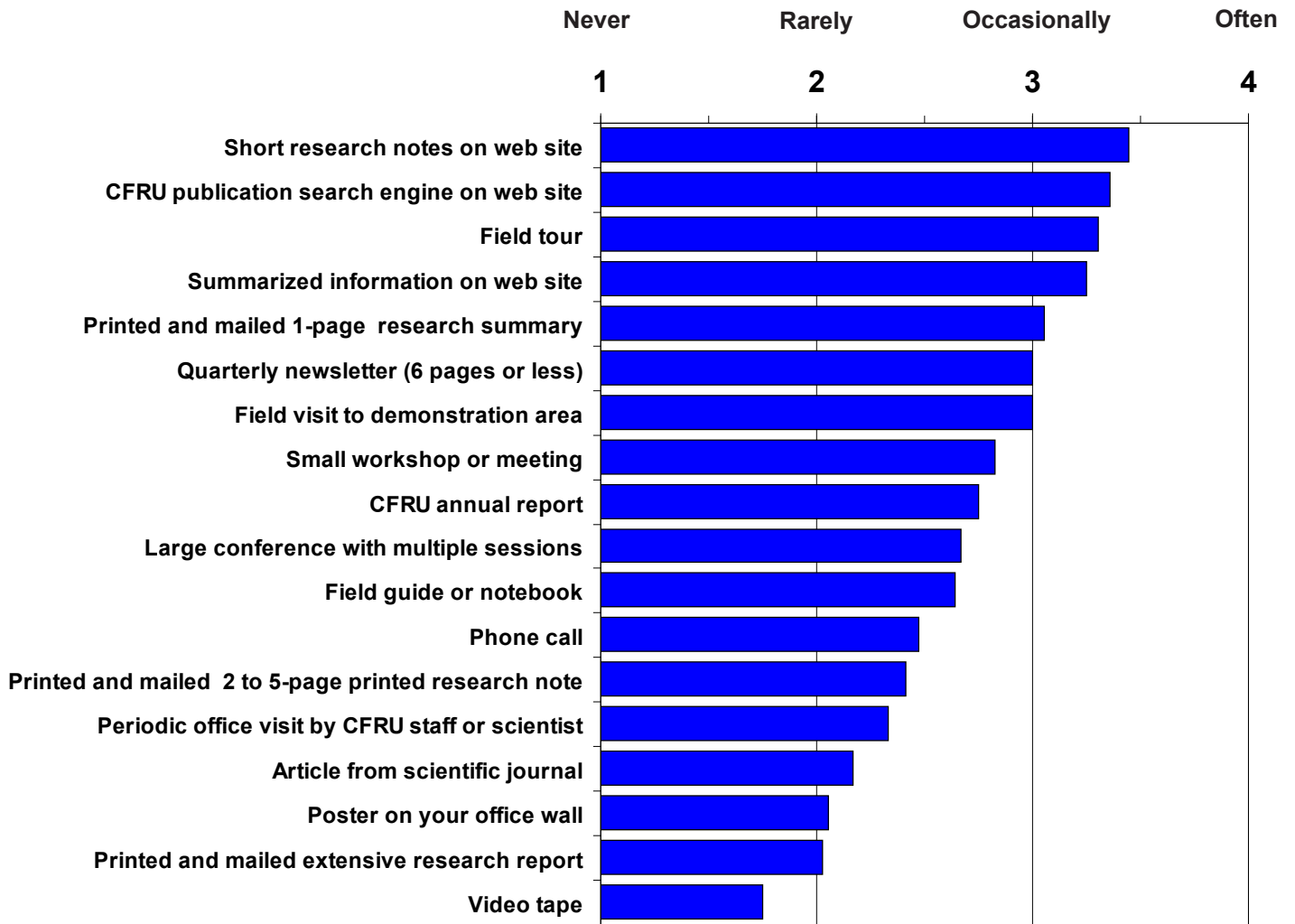


Figure I.2: Ranking of methods for receiving research results by CFRU members.



**Appendix II – Advisory Committee Bylaws****COOPERATIVE FORESTRY RESEARCH UNIT  
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 the CFRU and advises the University of Maine on all administrative matters pertaining to operation of the CFRU.

**ARTICLE III – Responsibilities**

Responsibilities of the Advisory Committee are to:

- 1) Define the mission, objectives, and guiding principles of the CFRU.
- 2) Maintain and periodically update the bylaws governing the Advisory Committee.
- 3) Maintain and periodically update the CFRU Prospectus that governs administration of the CFRU.
- 4) Define the research needs and priorities for the expenditure of funds contributed by CFRU Cooperators.
- 5) Approve the appointments of the CFRU Director and Cooperating Scientists.
- 6) Develop and maintain base funding for the CFRU, including recruitment of new members.
- 7) Review all pre-proposals for research projects and recommend development of full project proposals
- 8) Review full project proposals submitted to the CFRU and render a decision about funding and/or in-kind support for proposed projects.
- 9) Review and approve annual research and administration budgets presented by CFRU Director and Staff.
- 10) Advise and assist Director of the Center for Research on Sustainable Forests on all matters relating to the administration of CFRU.
- 11) 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.
- 12) Periodically review the progress of Approved Research Projects and in cooperation with Director, ensure that results from Approved Research Projects are delivered in a timely manner.
- 13) In cooperation with Director and Cooperating Scientists, ensure research results from Approved Research Projects are disseminated to all CFRU Cooperators in a timely and efficient manner.
- 14) Provide CFRU personnel with an individual organization contact list for the purpose of disseminating research deliverables via mail, email or fax.

**ARTICLE IV – Membership**

The CFRU Advisory Committee will consist of one representative from each member organization that contributes \$1,000 or more in annual dues and the Director of the Center for Research on Sustainable Forests. One representative from the USDA Forest Service, Northern Research Station and one from the National Council of Air and Stream Improvement (NCASI) also will be members. The USFS representative will be a voting member. The NCASI representative will be a non-voting member.

Each member 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 these officers shall be for two years beginning January 1 of each year.
- 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 Center for Research on Sustainable Forests will provide a Staff member to record and publish the minutes of the meeting and assist the Chairperson with correspondence as required.
- 7) Duties of the officers are as follows:

**Chairperson:**

- 1) Set the date, time, and place of meetings, and working with the Director and CFRU Staff, prepare and send agenda of meetings to CFRU Staff, Cooperating and Project Scientists, and Advisory Committee members in advance.
- 2) Preside over all 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 in developing 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 appointments as required.
- 5) In cooperation with the CFRU Director and through approval of Advisory Committee, select the 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, and CFRU Director, advise, assist, and approve all administrative and policy matters affecting the functioning of CFRU.
- 7) Shall present a slate of officers to the committee for vote at the last meeting of the calendar year in which an election of Officers is called.

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. A summer meeting or additional meetings may be called by the Chairperson as needed. A quorum of the Advisory Committee will be 51% of the membership.

**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 the CFRU shall be described in a published CFRU Prospectus that will be revised periodically by the Advisory Committee through a majority vote. The Advisory Committee Chairperson and Director of the Center for Research on Sustainable Forests shall keep official copies of the CFRU Prospectus.

**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 members of the Advisory Committee.

**ARTICLE XI – Additional Financial Contributions**

Any Cooperator may elect to provide the CFRU with additional financial contributions (through direct financial or in-kind contributions) to support 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 the 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 dues payment. The same rules and regulations that govern acceptance of annual dues will apply to any additional financial contributions.



## Appendix III – Policies and Procedures

**POLICIES AND PROCEDURES****MEMBERSHIP CATEGORIES AND DUES**

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

Category	Description	Services received	Annual dues
<b>Forest Landowner / Manager</b>	Owner or manager of commercial forestlands in the state of Maine	<ul style="list-style-type: none"> <li>• Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for landowners / managers donating \$1,000 or more)</li> <li>• Immediate notification to all frontline forest managers in your organization as new CFRU research notes, reports, and other materials are released</li> <li>• Internet password access to all CFRU publications (including research notes, full research reports, and annual reports)</li> <li>• Quick access to CFRU scientists for technical advice and support</li> <li>• Participation in quarterly Advisory Committee meetings and annual field tour</li> <li>• Listing of your company name as a CFRU cooperator on all publications, poster displays, and web page</li> <li>• Opportunity to have CFRU research projects conducted on your lands</li> <li>• Access to CFRU databank</li> </ul>	<p>Three-tiered dues structure based on amount forestland owned and/or managed: \$0.0575 / A on first 1 to 500,000 A, \$0.0525 / A on next 500,000 to 1,000,000 A, and \$ 0.050 / A for each acre &gt;1,000,000 A.</p> <p>(Acre calculation includes all lands and waters less acreage of water bodies ≥10 acres in size)</p> <p>(\$1,000 minimum)</p>

Category	Description	Services received	Annual dues
<b>Mill owner / Wood Processor</b>	Owner of pulp and paper mill or sawmill in the state of Maine that does not own or manage commercial forestland	<ul style="list-style-type: none"> <li>• Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for mills donating \$1,000 or more)</li> <li>• Immediate notification when new CFRU research notes, reports, and other materials are released</li> <li>• Internet password access to all CFRU publications (including research notes, full research reports, and annual reports)</li> <li>• Participation in quarterly Advisory Committee meetings and annual field tour</li> <li>• Listing of your company name as a CFRU cooperator on publications, poster displays, and web page</li> <li>• Access to CFRU databank</li> </ul>	\$0.0125 per ton of pulp, paper, and other wood products processed per year  (\$1,000 minimum)

Category	Description	Services received	Annual dues
<b>Corporate</b>	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"> <li>• Voting representation on CFRU Advisory Committee that directs all CFRU research and activities (for medium and large corporations donating \$1,000 or more)</li> <li>• Immediate notification as new CFRU research notes, reports, and other materials are released</li> <li>• Internet password access to all CFRU publications (including research notes, full research reports, and annual reports)</li> <li>• Participation in quarterly Advisory Committee meetings and annual field tour</li> <li>• Listing of your company name as a CFRU cooperator on publications, poster displays, and web page</li> </ul>	<b>Small:</b> \$1,000 per year if gross revenue <\$100,000  <b>Medium:</b> \$3,000 per year if gross revenue is \$100,001 to \$1,000,000  <b>Large:</b> \$5,000 per year if gross revenue is >\$1,000,000

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

All dues are to be paid one year in advance of the fiscal year in which the funds are used. Billing is generated by the CFRU each January for contributions financing the next fiscal year.

## 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. No overhead is assessed on funds allocated for the administration of the CFRU. All salaries and stipends of the 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 CFRU administrative account participates in earnings from the temporary investments program of the University system.

Annual CFRU budgets are developed based on the gifts contributed to the CFRU account in the previous year, plus any unused committed 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. Department Chairs of Director and Cooperating Scientists' home departments or units will provide guidance and support to faculty based on departmental mission and role of faculty members in CFRU research.

The CFRU Director will supervise all funds expended by the 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 the university 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 School of Forest Resources and College of Natural Sciences, Forestry, and Agriculture will provide office and laboratory space without charge for the CFRU Director, Cooperating Scientists, and Support Staff. The College of Natural Sciences, Forestry, and Agriculture is also responsible for maintenance of the CFRU research storage building on the university forest properties (Orono) and the CFRU trailer (Telos Camp).

### **CFRU Vehicles**

Vehicle charges for Approved Research Projects will be included in the budget section of the Full Research Proposal. Only vehicles used by the CFRU Director and Support staff will be maintained under the Administrative Budget.

## **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 mailing list for all CFRU communications, a representative from each member organization will annually review the mailing lists for their organization's contact personnel. Current names, mailing addresses, email addresses, phone numbers, and fax numbers are to be provided to the CFRU Research and Communications Coordinator at the first Advisory Committee Meeting of each calendar year.

## Appendix IV – Format for Pre-Proposals

### COOPERATIVE FORESTRY RESEARCH UNIT PRE-PROPOSAL (maximum of 3 pages)

**PROJECT TITLE:** *include brief and descriptive title*

**PRINCIPAL INVESTIGATOR(S):**

Name	Organization
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**POTENTIAL COOPERATING CFRU MEMBERS OR OTHER RESEARCH ESTABLISHMENTS (if any):**

Contact	Organization
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**PROJECT OBJECTIVES:**

*Describe, in bullet form, specifically what objectives are to be accomplished and/or hypotheses to be tested by the proposed research project.*

**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 THE CFRU:**

*Briefly describe how the above project objectives meet the stated mission and objectives of the 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:**

*List sources and amounts of other funding sources supporting or likely to support this work.*

**DELIVERABLES:**

*Briefly list products/outputs expected from project.*

## Appendix V - Format for Full Research Proposal

### COOPERATIVE FORESTRY RESEARCH UNIT FULL RESEARCH PROPOSAL (maximum of 10 pages plus resume 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(S):**

Name                      Organization

Phone:                      Fax:                      Email:

**NAME & ADDRESS OF PRINCIPAL RESEARCH ESTABLISHMENT:**

**CO-PRINCIPAL INVESTIGATORS:**

Name                      Organization

**COOPERATING CFRU MEMBERS OR OTHER RESEARCH ESTABLISHMENTS:**

Contact                      Organization

**OTHER RESEARCHERS, STUDENTS, & PROFESSIONALS:**

Name                      Organization

**PLANNED START DATE:**                      *month and year*

**PLANNED TERMINATION DATE:**                      *month and year*

**AMOUNT APPLIED FOR FROM CFRU:**

*Include total amount requested over how many years.*

**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 (applicable to organizations outside of U. Maine).*

**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 and/or hypotheses to be tested 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:**

Deliverables	Date
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*Include 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.*

**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 1-2 page CFRU Results articles are strongly encouraged*
- *a final report is required within 6 months of project termination, that will be published as a CFRU Technical Report or Note*
- *all data produced from the project, if CFRU is the principal funding source, will be deposited in 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**

- *include multiple-year budgets if appropriate*
- *funding will be renewed annually based on evaluation of previous years performance*
- *show value of all actual and potential shared funding and in-kind contributions from other sources*
- *All projects based at the University of Maine must include 10% overhead. CFRU will not pay more than 10% overhead on projects from external organizations.*
- *budget should include the following sections in a table:*

**Expenses:**

Principal and Co-Principal investigator's FTE, salary, and benefits  
 Technical support FTE, salary, and benefits  
 Graduate student FTE, stipend, and tuition  
 Equipment  
 Supplies  
 Travel  
 Communications / Publications  
 Other

FY??

FY??

FY??

**TOTAL****Leveraged Funds:**

Source and amount of shared funding firmly committed  
 Source and amount of shared funding potentially committed  
 Source and estimated amount of in-kind contributions

**Total requested from CFRU**  
**CFRU funding as proportion of total**

**University of Maine overhead (10%)**  
**Total requested from CFRU with UMaine overhead**

**LITERATURE CITED:**

*Include any literature citations used above*

**RESUME OF PRINCIPAL AND CO-PRINCIPAL INVESTIGATORS:**

*(maximum of 3 pages for each investigator)*

**APPENDICES:** *(up to 10 pages of additional documentation in support of the project - if necessary)*



