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## Research Programs at the University of British Columbia Research Forests

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### Abstract

The Faculty of Forestry at the University of British Columbia manages two Research Forests and cooperates on a third Research Forest with the University of Northern British Columbia. These three properties have a total area of 24,705 hectares (ha) in four different climatic regions, ranging from coastal temperate rainforest to arid continental forest/steppe. The primary goal of the Research Forests is to support the education of forestry students. Active research and demonstration programs help to accomplish that goal. Two different approaches to research are used:

Develop conditions suitable to hosting research projects in a variety of disciplines. The management of the Research Forests, including harvesting and silviculture programs, is used to develop conditions suitable for research and demonstration. Such projects are conducted by faculty members, students, and researchers outside the faculty and the university.

Design and implement research projects to develop information that is important to the management of the forest estate. Research Forest staff are investigators in a number of active research projects.

Several research projects are described to exemplify these two different approaches. One long-standing challenge is to ensure the availability of results and integrity of records to provide information useful in future research and extension projects. Research projects rigorously designed on large sites provide the best opportunity for future research and demonstration projects. Managing forestry operations while maintaining research opportunities can be expensive, and requires willing cooperation amongst the staff. Demonstrating innovative management and maintaining a long-term perspective are our principle methods of supporting researchers. This allows us to establish rigorous studies on sites that will be useful in the future.

*Keywords:* Research Forests, British Columbia

### Introduction

The University of British Columbia (UBC) is located in Vancouver, Canada. It is a large university by Canadian standards, with an enrollment of approximately 37,700 students from throughout Canada and the world. The Faculty of Forestry is one of the smallest faculties in the university with 730 students and 57 faculty members (Watts 2001). A very active research program includes a range of basic and applied research in conservation, forestry, and forest products.

In order to facilitate its teaching and research functions, the faculty manages two research forests and cooperates on a third research forest with the University of Northern BC (see Figure 1). As described in Table 1 below, these three properties have an area of 24,705 hectares (ha) in four different climatic regions, ranging from coastal temperate rainforest to arid continental forest/steppe.

The Aleza Lake Research Forest is managed cooperatively by the two universities in British Columbia that grant degrees in forestry. Originally established by the provincial government in 1924, the Aleza Lake Forest was only adopted as a university forest in 2001. UBC's involvement in that forest is very recent, and for that reason this article focuses on the Alex Fraser and Malcolm Knapp Research Forests.

The Research Forests support the Faculty of Forestry in its teaching and research mission by hosting research projects, conducting a limited research program, and creating and maintaining teaching sites. This paper discusses the management of the Research Forests, the nature of our research program, and how research projects are established and managed across our landbase.

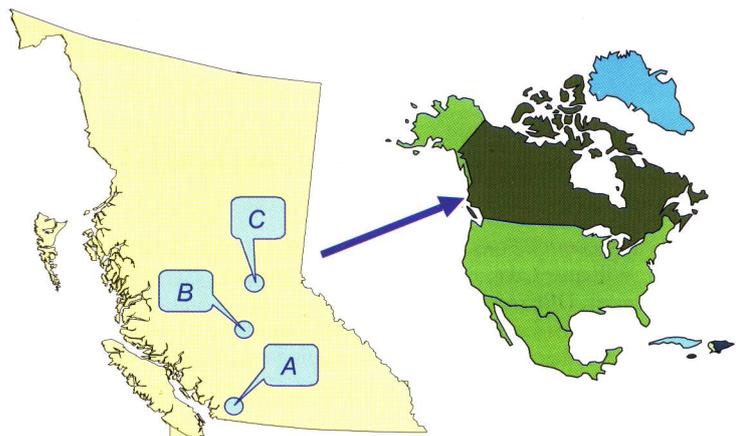


Figure 1. Location of University of British Columbia Research Forests. Malcolm Knapp (A), Alex Fraser (B) and Aleza Lake (C) Research Forests represent a variety of conditions in British Columbia, Canada.

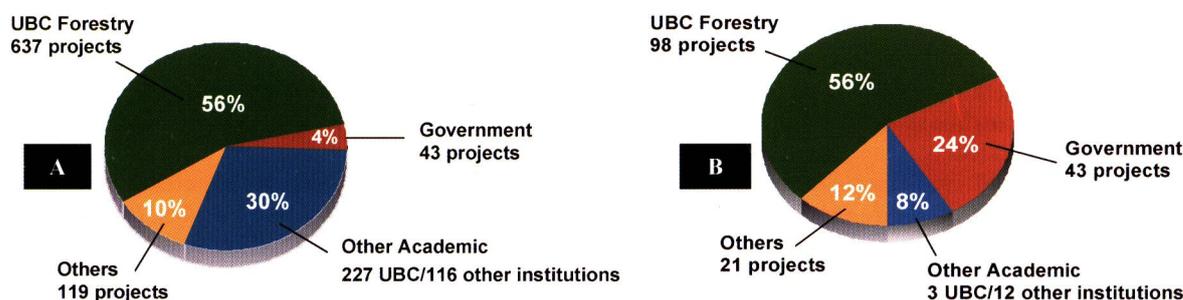


Figure 3. Research projects installed from inception to 1998 on the UBC Malcolm Knapp (A) and Alex Fraser (B) Research Forests. (From Sanders 1998)

Table 1. Description of UBC Research Forests.

Research Forest	Established (Year)	Ownership	Climate Description (Meidinger and Pojar 1991)	Area (ha)
Malcolm Knapp Research Forest	1941	Private Land owned by UBC	Dry or very wet maritime coastal western hemlock; rainy coastal climate with cool summers and mild winters.	5,153
Alex Fraser Research Forest	1987	Crown Land under tenure to UBC	Dry warm sub-boreal spruce; continental climate with seasonal extremes – severe snowy winters, and short, warm, and moist summers. Moist cool interior cedar hemlock; continental climate with cool wet winters and dry warm summers. Dry cool interior Douglas-fir; continental climate with warm dry summers and cool winters.	9,802
Aleza Lake (co-operative with UNBC)	1924	Crown Land under tenure to Aleza Lake Research Forest Society	Wet cool sub-boreal spruce; continental climate with seasonal extremes – severe snowy winters, and short, warm, and moist summers.	9,750
Total Research Forest Area				24,705

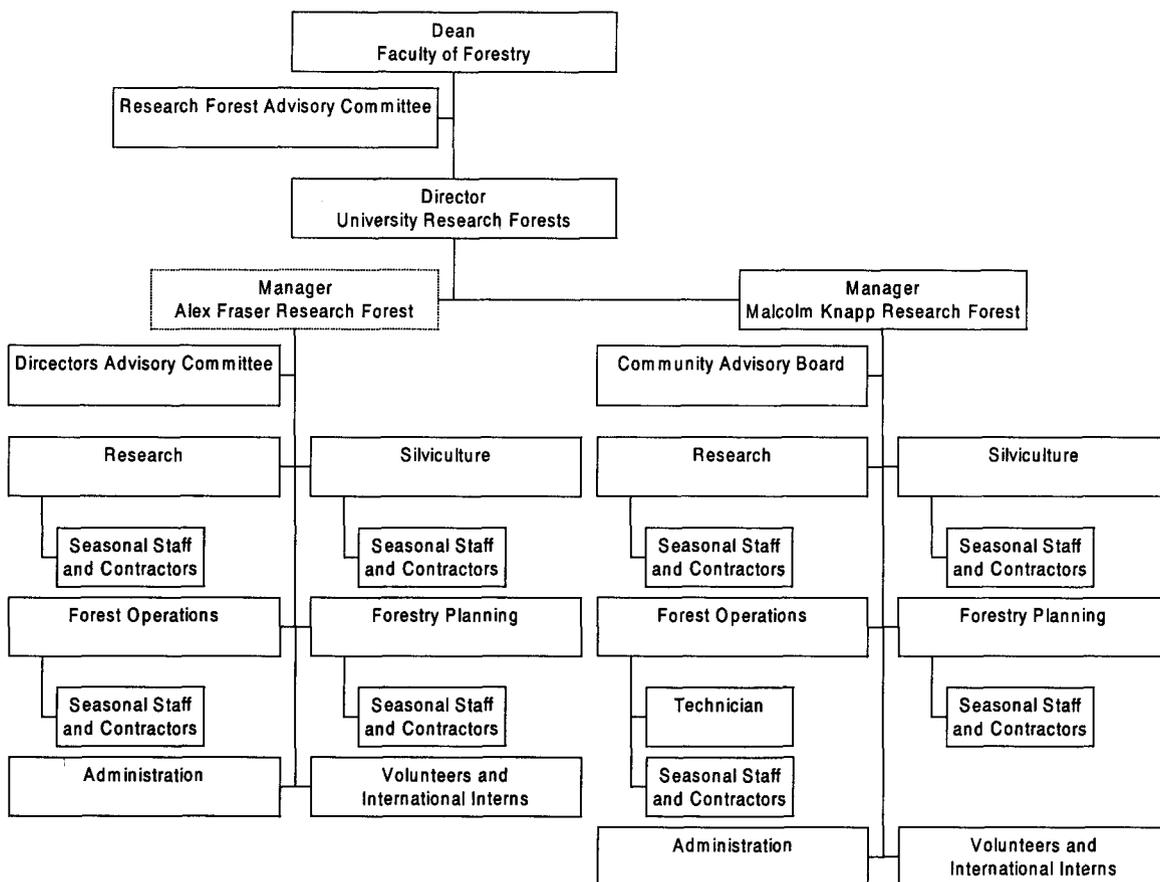


Figure 2. Functional organization of the UBC Research Forests. Note that the Director's position is filled by one of the Research Forest Managers, currently from the Alex Fraser Research Forest.

**Forest Administration  
Financial**

The Alex Fraser and Malcolm Knapp Research Forests (collectively referred to as the Research Forests) are administered as a department of the Faculty of Forestry at UBC. The Research Forests have no budget support from the university and are required to be financially self-supporting. Our primary source of revenue is the sale of timber, harvested annually for sale to forest products companies. Other sources of revenue include government grants and contracts, site rentals and leases including the operation of an outdoor education centre for overnight guests, and sales of minor forest products.

While the university does not provide any budget, neither does it extract any revenue from the Research Forests. Spending is at the discretion of the Manager of each forest, which is overseen by the Director and the Dean of the Faculty.

**Programs and Staffing**

Each Research Forest is organized to integrate their teaching and research functions with the timber harvesting and silviculture operations. Figure 2 below shows the functional organization of the Research Forests. The combined staffing at the two Research Forests is approximately 20 full-time equivalent positions, of which about three quarters are professional and technical staff, with the balance focused on administration and labour. Most forestry operations are conducted by private contractors under the direction of the staff.

Each person on staff has a role in the education function of the Research Forests: to ensure that all activities provide educational opportunities; and to provide their expertise to visitors according to the educational interests of the group. Each person on staff also has a role in the research function of the Research Forest: to actively seek ways to accommodate meaningful research opportunities in all the functions of the Research Forest.

### Research at the UBC Research Forests

As of the beginning of the current year, 940 research projects had been established on our Research Forests. We operate the Research Forests as research facilities, and we do not have specific research programs directed by the Faculty of Forestry. We see ourselves as the operators of a large outdoor laboratory, and our forestry operations create opportunities for a variety of research and educational activities.

To paraphrase Clark Binkley (former Dean of the UBC Faculty of Forestry), we have Research Forests to support teaching in our undergraduate and graduate programs. Faculty members conduct research projects throughout British Columbia, and outside BC and Canada. However, research projects installed on the Research Forest create a concentration of teaching opportunities for the faculty.

Our primary task is to provide a variety of conditions that are suitable to conducting research, and then to match the opportunities we have created to the researchers' requirements. We are not used solely by researchers at the Faculty of Forestry. Research on the Research Forests is also conducted by other faculties at UBC, other universities, other research institutions, government agencies, private consultants, and companies (see Figure 3).

### Hosted Research Projects

The efforts of researchers who come to work on the Research Forest need to be coordinated and protected. Each Research Forest employs a full-time research coordinator, who has professional credentials and a thorough understanding of research methods. Our primary concerns are to: help researchers select suitable sites; assist with legislative requirements, field installation, and operational treatments; provide field samples and collections for off-site research facilitate synergies between researchers protect installed projects from conflicts with other research, forestry operations, and insects or fire capture and retain information generated from the research extend the results of the research dismantle completed research project field sites that don't provide additional teaching or research opportunities.

A set of tools has been developed to coordinate the use of our research facility.

#### Researcher Use Policy

Researchers working on the Research Forests are required to review and agree to terms and conditions regarding their project work. The principle conditions are: submission of a project outline form and work plan; compliance with standards for field installations and clean-up after completion; adherence to environmental and safety standards and legislative requirements; submission of detailed project field site maps; and submission of project progress reports, end-results, and extension materials.

We use the information researchers provide us to screen research projects for operational, administrative and legislative requirements, and potential conflicts with standards, and other research.

### Research Project Database

Good information management is vital to the success of our research program. We have developed a Microsoft Access™ database to keep track of research project topics, activities, scope, locations, investigators, and end-products. The database is linked to our geographic information system (GIS) which allows for automatic updates of spatial information. Information is also captured in detail in our paper files.

### GIS Coverage of Research Project Locations

All project locations are mapped on our GIS to ensure that project sites will not be overlooked during the forestry operations. This critical step allows us to screen other research proposals, silviculture, harvesting and road construction plans for potential conflicts with installed research projects. If an apparent conflict arises, the operations are modified, or the researcher is invited to suggest a preferred solution.

### Internal Research Program

The management and operation of nearly 15,000 ha of forest land requires a lot of information. We occasionally initiate research projects designed to provide us with information that is of critical or strategic importance to the management of the Research Forest. Fish and wildlife inventories, permanent sample plots for growth and yield studies, regeneration methods, site restoration, impacts of timber harvesting on visual quality, and impacts of insects and diseases have all featured in research projects funded by the Research Forests. Where possible, we work to find a researcher with similar interests who can take on these projects. Frequently we employ graduate students to carry out the projects for us, and occasionally undergraduate students take on our internal projects as thesis topics.

### Discussion

Our approach to research has some significant benefits, but also presents some challenges.

#### Benefits

Our research topics are very wide ranging, and this provides a wonderful diversity of teaching opportunities.

The focus of the program shifts in response to information needs, provincial forest management objectives, and current state of knowledge. The program diversity creates synergies in research and education.

We form a strong link between the Faculty of Forestry and the broader forest research community in BC.

We provide many services (assistance, site security, information management and local expertise) to researchers that they would not find outside of the Research Forests.

### Challenges

As a self-supporting department, we must remain economically stable.

The success of the Research Forests and the calibre of our research program is dependent upon the benefits we provide to researchers.

Providing those benefits results in increased costs to all other programs (administration, planning, silviculture, and harvesting). Much of that cost is not recoverable.

A diverse staff with different areas of expertise must understand and support our goals, through a collaborative approach to the problems posed by a diverse and active research program.

### Examples of Significant Research Projects

Over the years, we have had some very significant research projects installed. One project initiated by Professor J.H.G. Smith and Dr. J. Walters in 1957 was designed to examine the impact of plantation spacing upon the growth and yield of several native conifer species. That research installation is now almost 45 years old, and has provided one of the largest data sets on managed stand growth and yield in North America. Since 1980 it has been repeatedly measured every five years, and virtually every currently practising professional forester who graduated from UBC has visited that site at one time or another.

A project initiated by Harold Armleder of the Ministry of Forests has been examining the ecology of mule deer (*Odocoileus hemionus hemionus*) since 1981. We have opened 15 files concerning mule deer, involving 13 investigators. These projects have resulted in the development of forest management recommendations that have been modified for adoption throughout the interior of British Columbia.

A project initiated by Ken Day (Research Forest Manager) in 1989 is examining the uniform

shelterwood method to regenerate Douglas-fir (*Pseudotsuga menziesii* var *glauca*). This is a cooperative research project with the Ministry of Forests and Weldwood of Canada, a forest products company. The project is one of the earliest shelterwoods implemented in the area, and has led to the installation of five additional projects, with ten researchers involved.

A large project initiated by a group of UBC Faculty in 1995 was intended to test the assumptions about riparian management contained in the Forest Practices Code Act of BC (Prov. BC 1995). This project involved harvesting 20% of 12 small watersheds with varying levels of riparian protection. Thirteen different researchers are now involved in ten research projects, asking questions that range from riparian and terrestrial ecology to tree wind-firmness and regeneration of forest crops.

The principle tasks of the Research Forests are to remain economically stable while providing field conditions that will provide for high-calibre research and education programs on the Research Forests. Coordinating the efforts of researchers and ensuring that their investments of time and effort are captured and protected is a full time task for one staff person on each Research Forest. Working with research is an important part of every person's duties on the UBC Research Forests.

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