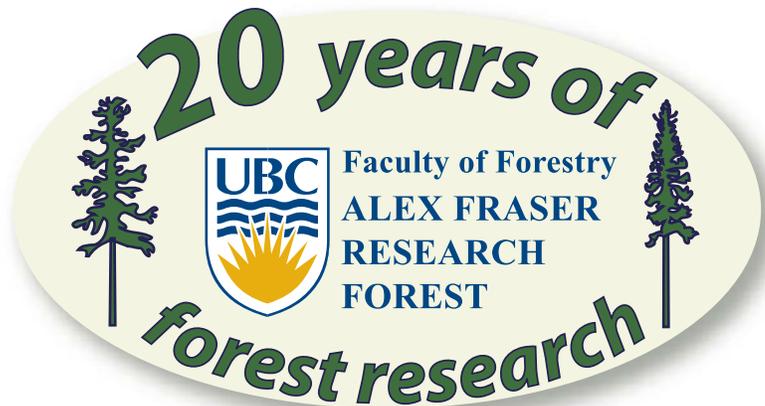


History of  
the UBC Alex Fraser  
Research Forest  
1987-2007

Excerpts from Management and  
Working Plan #3

Ken Day, MF, RPF  
Manager



© UBC Alex Fraser Research Forest 2007



**Forestry**  
University of British Columbia

Welcome to Our Classroom

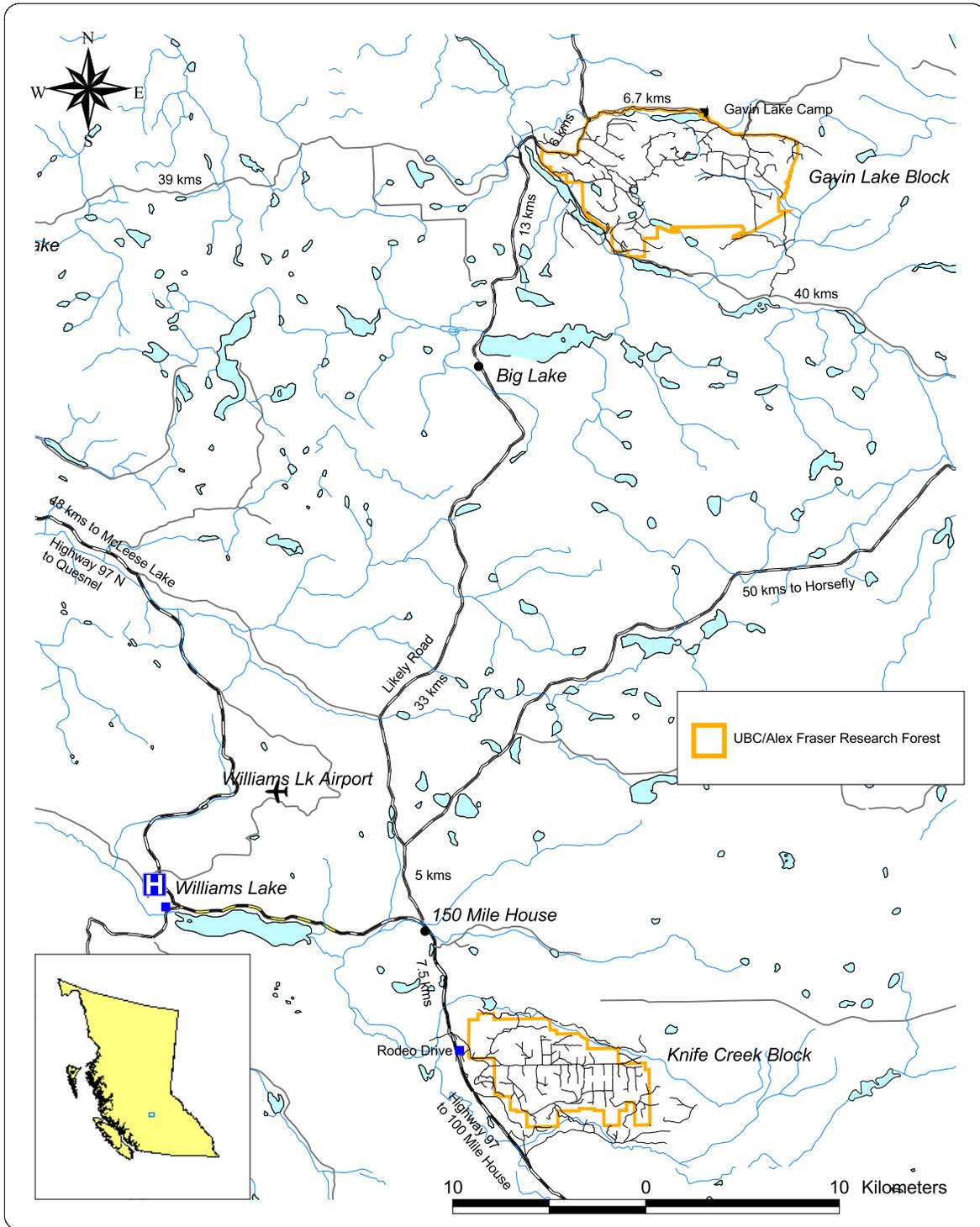


Figure 1: Location map of the UBC Alex Fraser Research Forest

## ***Preface***

The Alex Fraser Research Forest is a department of the Faculty of Forestry at the University of British Columbia. The Research Forest was established in 1987 for the purpose of research, education and demonstration of integrated resource management for the interior of British Columbia. The founders selected two areas near Williams Lake to represent a range of climatic conditions, existing research sites, and diverse opportunities in forest management.

Since our inception, the Research Forest has hosted research and conducted education and demonstration for a wide range of audiences. Now twenty years old, we have opened more than 275 research project files

We have the great honour of working on a lovely piece of land with which we have become intimately familiar. This gives us the opportunity to observe the impacts of our activities over a long time frame, and develop new understanding as time passes. We have built a reputation for careful management, and for taking neutral positions in land use debates. We are proud of our accomplishments, and we look forward to many more years of service to the resources management community of British Columbia.

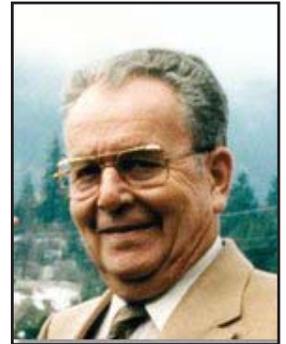
## ***Alexander Vaughn Fraser (1916-1989)***

*(Excerpts from Hansard Wednesday, May 10, 1989) HON. MR. VANDER ZALM:  
Alex Fraser's long and eminent political career began in his beloved Cariboo region where he was elected commissioner of the village of Quesnel in 1949. He served as chairman of the village of Quesnel from 1950 until 1958, and was the first mayor of the town of Quesnel from 1958 until 1969.*

*He was first elected to the B.C. Legislature in 1969 and served for 21 consecutive years. In 1975, he was appointed Minister of Transportation and Public Works and remained with the Transportation portfolio until overcome by illness a few years ago.*

*Alex Fraser was truly a grass-roots politician who was loved and admired by his constituents and respected by his political opponents and allies.*

*British Columbians will always remember him as a man thoroughly committed to the betterment of life for the citizens of the province he so proudly served. He was a man dedicated to his calling and his province. He was a man of courage and conviction.*



Alex Fraser, MLA, 1986  
([http://www.livinglandscapes.bc.ca/upperfraserbasin/gertrude/political\\_life.html](http://www.livinglandscapes.bc.ca/upperfraserbasin/gertrude/political_life.html))

## ***Dedication***

This brief report is dedicated to our founders -- those people who concieved of having a university research forest in the Cariboo, and who worked so effectively to make it happen. We hope that you recognize our work as a tribute to your efforts; we are in your debt.

*Founders: Glean Lubenstein, Van Scoffield, Ethel Winger, John Szauer, Jack Leggett, Laurie Wilson, John Mansell, Gail Wallin, Bob Kennedy, Don Munro*

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## ***Introduction***

The character of the Alex Fraser Research Forest on both blocks is, to a large measure, a product of natural and human history. Frequent wildfires in the Knife Creek block have created an uneven-aged stand condition, and in the Gavin Lake block have resulted in a predominance of mid-seral and mature stands.

Logging activity dates back to the mid 1940s (and certainly before) in the Knife Creek block, and to the early 1960s in the Gavin Lake block<sup>1</sup>. These logging practices and the resulting silviculture activities and road networks, combined with successful fire suppression activities, have changed the structure of the forest considerably. In addition, grazing and range management, trapping, hunting, fishing, and fish and wildlife management have helped to shape the forest.

All of these activities have altered the nature of the forest resources as they exist today. It is this modified resource base which is managed to achieve Research Forest objectives. Change is a feature of natural ecosystems, and results from both natural processes and management activities. Management of an area is improved if we understand its history.

## ***History of the Knife Creek Block***

The Knife Creek block is located between Knife Creek and Jones Creek, which flow westward to the San Jose River. The San Jose River valley was occupied by native villages before European settlement, and

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1 History records and forest cover maps show logging as early as 1942 in the Knife Creek block. The earliest logging in the Gavin Lake block is probably from the 1950s, but maps and records do not show year of disturbance for the areas logged selectively on the Beaver Valley slopes and on the north shore of Gavin Lake.

contains the Cariboo Wagon Road (later the Cariboo Highway, Highway 97) and the Prince George Eastern Railway (latterly BC Rail, now CN Rail). Due to its valley-bottom location, this block is in one of the most heavily travelled sections of the Cariboo Landscape. The old Wagon Road, and before that the Hudson's Bay Brigade trail, passes the west boundary of the forest. The oral history of the Williams Lake Indian Band indicates that the forest contains sacred ceremonial grounds, and the Jones Creek Valley was used as a travel route to summer camping areas. Its proximity to ancient village sites assures us that the Knife Creek mule deer winter range has been an important winter hunting area.

Three periods of history have had significant impacts upon the forests of Knife Creek block, and are discussed below. Much of the background information on the current forest conditions is not referenced. It represents the author's interpretation of information from a wide variety of sources, from the popular press to oral history, and includes ample deduction and speculation.

The early period (before 1860) was important to the area, because the First Nations people apparently used fire to manage their environment. The most probable reasons for burning include fire hazard reduction, and management of forests for particular hunted animals or food plants.

Settlement of ranches (1860s to 1940s) started along the wagon road during the Cariboo Gold Rush, to supply miners with meat and other supplies. Road houses and ranches adjacent to the Knife Creek block included 141 Mile House (1861) (Figure 6), 144 Mile House (1867) and 145 Mile House (1861) (Patenaude 1996). Jones Creek is

probably named for Mrs. Jones, who operated 145 Mile House.

The ranchers depended upon the forests for timber and for summer range for their cattle. Hay was cut from natural grasslands, meadows, and later from developed hay fields. Development of ranches adjacent to the Knife Creek block greatly altered the landscape, since natural grasslands and meadows in the valleys were expanded for production of feed crops under irrigation. Irrigation ditches are still in use on the southern and western boundaries of the Forest.

In 1913 and 1914 E.G. McDougall conducted reconnaissance surveys of the Lillooet and Cariboo Land Districts. The following passage from his report (McDougall 1913) describes the area around the Knife Creek block (brackets [ ] represent words that are not legible on the old carbon copy of his report):

*“The San Jose River flows north-westerly from Lac La Hache to Williams Lake, descending from 2700 feet to 1950 feet elevation. The valley is about two miles wide, and is bounded by escarpments rising to [ ] elevation. That on the south-west is precipitous, and the plateau behind it is stony for some distance: while that on the N.E. is gentle, and the plateau is well supplied with meadows. There are three tributary valleys coming in from the east, those of Knife Creek, Jones Creek, and 150 Mile Creek. All contain considerable areas of good bottom land. The plain above the main valley slopes gradually up to the base of some rocky hills, 4200 feet in elevation, which [ ] east of the Horsefly Road, and supply the headwaters of Knife Creek. Although fairly level, the plain is very stony in parts. Some of the meadows at the higher elevations, partake of a muskeg character. Nearly [all] the best land throughout this block has been taken up years ago, the cultivated portions produce excellent crops. Cultivation [ ] is frequently neglected in favour of the road-house business, on plan [sic] of scarcity of labour.*

*The timber is distributed in belts along the sides of the main valley, and behind those belts lies the burned country, which [is] covered with a patchy*

*Black Pine stand, from ten to fifty years [old]. The persistence of the old stands in positions so exposed to fire [must] be due to the former periodical removal of undergrowth and litter [by] light burning, and to some extent by the pasturing of horses and [ ]. Away from those influences, the forest would come into an extremely flammable condition, and when, at longer intervals, fire did reach [them,] the result would be total destruction.*

*Portions of the stony plateau country might serve for [ ] pasture, but in general the land unfit for agriculture would be [ ] in forest. This part of the country seems to be well adapted to [dry] farming. It is traversed by the Cariboo Road and the P.G.E. now under construction.”*

McDougall (1913) reported that only 16% of the area surveyed was timbered, and 69% had been burned. Presumably “patchy stands of Black Pine” were not considered timber, since there was pressure from ranchers to allow burning of pine stands to increase grass. This had been a common practise until a fire control law was introduced.

In his more complete report, McDougall (1914) describes the forest types of the area as follows:

*“The Douglas Fir type formerly covered a large part of the interior; mostly above 3000 feet elevation; but it is now limited to certain strips and patches along the edge of the valley of the Fraser, San Jose, Bridge and Bonaparte Rivers, and to a few isolated patches elsewhere. It ascends to an elevation of 4000 to 5000 feet. The stand varies in density from 2000 to 6000 feet B.M. per acre.<sup>2</sup> Reproduction is usually good, taking place chiefly in openings, which are numerous. This forest is of some importance for local lumber supplies, but the poverty of the stand and the poor quality of the product would make it unavailable for outside markets.*

*The Lodgepole Pine type is the most extensively distributed in the Interior, but is probably of a transitory character. It comes in on burned areas*

---

2 1000 board feet per acre is approximately 10 m<sup>3</sup>/ha. Such low volume estimates reflect the utilization standards in place at the time McDougall wrote his report. Lodgepole pine was not used, and only large logs of high quality would have been considered merchantable.

formerly occupied by other types, especially the Douglas Fir type; it may also occupy areas that were formerly prairie. As a rule it is wind-thrown before reaching maturity, but sometimes attains saw size, and in favourable locations might yield 2000 feet B.M. per acre. The stand is very dense, and the trees well-formed, though small; they often show frost cracks and other defects. This forest is used locally for fencing, building logs, etc., and might be utilized for pulp.”

The earliest records of industrial timber harvesting on the Knife Creek block date from 1942. It is likely, however, that small hand-logging sales for hand-hewn railway



PGE Tie Camp, 1921 (location unknown).  
Courtesy BC Archives D00072

ties began at about the time the railroad came to Williams Lake around 1920. Ties were hewn on two sides with a broad axe

from Douglas-fir trees, skidded by horses to a landing for debarking and cutting to length. They were then hauled in a sleigh to the railroad, where they were stacked for pickup. A good tie cutter could cut 40 ties in a day, and would make \$4.50 (Eagle 1979).

Thwaites (1964) states that:

*“Lumbering in the Cariboo is almost entirely a post-World-War-II industry. It had its beginnings with local ranchers and others cutting timber on their lands and selling the logs or sawing them into cants or rough lumber.”*

From the 1940s to the early 1960s (the Bush Mill era) the drybelt fir stands in the Williams Lake area were exploited for railroad ties and saw timber. Most of this logging was done with horses skidding to tractor roads, and tractors were used to forward the logs to the portable sawmills. Except along the tractor roads, most of the trees selected were of a diameter to allow one tie to be cut. The horses were able to skid the smaller logs

fairly easily, and therefore greater distances. This type of cutting resulted in good stocking remaining in most size classes after logging, except close to the mills and adjacent to the tractor roads. Horses gave way to crawler-tractors and arch trucks<sup>3</sup> by the early 1960s. According to Thwaites (1964) the bush mills were primarily established by loggers moving up from the coast, and since they were principally loggers, the milling operations were simple. Utilization was poor by today’s standards, with up to 40% of each log lost to sawdust and shavings, and trim-ends were burned. Scattered bush mills meant that no utilization of the waste was possible (Thwaites 1964). Bush mills operated on the Knife Creek Block, in the east and north on Crown land, and in the west on private land.

Administration of the forest resource by the BC Forest Service was divided between the Kamloops Forest District and the Prince George Forest District. Mills in the Cariboo drew two-thirds of the volume from Kamloops Forest District (Thwaites 1964).

Under the structure of the 1960s, the Forest District was analogous to the current title of Forest Regions.

Between 1952 and 1962 the volume cut in the Kamloops Forest District increased by 126%, and in 1962 66% of the harvest volume was Douglas-fir (Thwaites 1964).



G.W.J. Moore Sawmill 150 Mile House (date unknown). Courtesy BC Archives NA-04611.

3 Arch truck -- a truck with an A-frame on the deck, over which a mainline travelled to reach out to timber from the road. These trucks were apparently able to skid a large load.

In the 1960s forest policy changed; sawmills were required to manufacture chips from sawmill waste, to feed a developing pulp industry in the interior. Very rapidly the bush mills began to shut down, and rights to public timber were bought up by the owners of planer mills in town. The planer-mill owners then used their new quota to build stationary sawmills. The centralized sawmill operators preferred to avoid logging, due to the expense of supervising the logging operations and the cost of owning and operating logging equipment, so contract loggers were used (Thwaites 1964).

With the advent of stationary sawmills in town, the technique shifted to diameter-limit cutting. All the trees within a cutblock over a certain diameter were harvested. Diameter-limits varied through time, from as low as ten inches (25 cm) in the mid-1960s to as high as 18 inches (45.7 cm) in the late 1970s. In the mid- to late-1960s lodgepole pine became merchantable. Areas logged in Knife Creek before 1967 had lodgepole pine left standing, but after that time the pine was cut. Although the diameter-limit system was usually successful in maintaining advanced regeneration, it often failed to maintain a good representation of thrifty mature trees, particularly where diameter limits were low. Also, this system tended to produce a stand that was poorly distributed, with voids and patches of excessive density.

In the late 1970s it was recognized that the diameter-limit approach was not as successful as it should have been, and that signalled the onset of the faller-selection methods. The faller-selection method was based upon the principles of single-tree-

selection management. It sought to remove about 50% of the volume from all of the merchantable diameter classes, and leave the healthiest trees to regenerate openings and add increment. Little logging was done on the Knife Creek block during the period of faller-selection, probably due to increasing conflict over harvesting on mule deer winter range.

In the early 1980s an intensive study of mule deer ecology was initiated on the Knife Creek block by the Ministry of Forests. The study was born out of conflict; the forest industry wanted continued access to the Douglas-fir, and Ministry of Environment saw continued harvesting on winter range as a threat to mule deer habitat. That study has been led by Harold Armleder, Rick Dawson, and Michaela Waterhouse for more than twenty years, and they have sought methods of integrating timber harvesting with mule deer ecology. Their initial methods were based upon the faller-selection method, but restricted harvesting to low volumes and long re-entry periods. Their

method was supported by many studies of mule deer ecology, generally including study sites in the Knife Creek Block.

In 1987 the Alex Fraser Research Forest was created and the first Resident Forester (the author of this report) was hired. Little harvesting

was carried out for the following decade, except the salvage of trees killed by Douglas-fir bark beetles. With funding from the Ministry of Forests, Research Forest staff have been able to focus on improving the condition of disturbed stands, through pre-commercial thinning and brushing. Starting in 1998, we began to harvest cutblocks due



Mule deer feeding experiment, RP 87-00. Stephen Walker photo.

to the increasing infestation of mountain pine beetles. Harvesting of mountain pine beetle-driven cutblocks was completed in 2004, with a total of 247 ha harvested in that seven-year period. Additional areas were harvested by single-tree salvage operations.

### ***History of the Gavin Lake Block***

The Gavin Lake Block is located on the north slope above Beaver Valley, northeast of 150 Mile House. First Nations people travelled through the area seasonally to gather food, and archaeological evidence and oral records indicate that the Gavin Creek drainage was an important area for food-gathering.

Travel routes from 150 Mile House to the Cariboo Goldfields passed by the western edge of the Gavin Lake Block. This was not



Gold Digger, BC by W.G.R. Hind, 1864. Courtesy of Royal BC Museum PDP00026.

the famous Cariboo Wagon Road, which ended at Soda Creek, but was an

unsurveyed road/trail that extended from Mountain House to Keithly Creek, and up over Yanks Peak to Barkerville. Evidence of this old road can be found east of the present Likely Road, and the old crossing on Gavin Creek is still visible.

A ranch and road house, known as Beaver Lake House, was operating as early as 1860 just west of the Gavin Lake Block. This operation served travellers as a provisioning stop, hotel, saloon, freight-wagon station, and guiding outfit (Patenaude 1995). The ranch is presently owned by Fred Tillotson, who has grazing rights on the Research Forest. Gavin

Lake is probably named for Gavin Hamilton, who operated the road house in the early 1900s.

#### *The Pathfinder*

*Long years ago I blazed a trail  
Through lovely woods unknown till then,  
And marked with cairns of splintered shale  
A mountain way for other men.*

*For other men who came and came;  
They trod the path more plain to see,  
They gave my trail another's name  
And no one speaks or knows of me.*

*The trail runs high, the trail runs low,  
Where wild flowers dance, or columbine;  
The scars are healed that long ago  
My axe cut deep on birch and pine.*

*Another's name my trail may bear,  
But still I keep, in waste and wood,  
My joy because the trail is there,  
My peace because the trail is good.*

*J. N.J. Brown  
(Klan 2004)*

In 1926 a large fire, reportedly started at a cabin on the north shore of Prouton Lake (Shelly Nicol, personal communications, 199\_), burned the large majority of the area of the forest east of Prouton Lake.

Starting in the 1950s, bush mills began to operate in Beaver Valley and at Gavin Lake. The mill at Gavin Lake was operated on the present site of the Gavin Lake Forestry Centre, owned and operated by the Gavin Lake Forest Education Society. Following are excerpts of a written history of the camp (adapted from Anon (1988)).

All-Fir Lumber was owned by an American named Mr. Vandivanter. All-Fir operated a sawmill on crown land at the eastern end of Gavin Lake from the mid-1950s to the early 1960s, and the evidence of their early logging can be seen in the partially harvested stands west of camp on the north shore of

Gavin Lake. The logs from this area were forwarded to the lake, probably by tractors, and the evidence of the tractor roads is still visible. Logs were boomed on the lake, as evidenced by the presence of old boom sticks at the outlet of Gavin Lake. The old de-watering spot can still be seen at the beach below the Forestry Centre fire pit.

According to Tillie Robertson, who was employed by All-Fir Lumber as a camp cook, the cookhouse, cabins and garage were located on the upper bench. The cookhouse was quite rustic; it had wood heat but lacked running water, and the lighting was provided by gas and coal oil lamps. A small bedroom was provided for the cook. Meat was kept cool in two small propane fridges.

Of the cabins provided for the men, four were built to accommodate married couples, with the other three or four cabins shared by four men each. The cabins were heated by wood, with the men responsible for cutting their own firewood.

Merrill-Gardner bought All-Fir Lumber in the mid-1960s. The first year at Gavin Lake was a busy one, according to Joe Hopp, a longtime Merrill-Gardner employee. With the sawmill operating and the logging going on, the number of men in the camp rose from 45 to 95 at times. All of the cabins on the site were full and many men brought in trucks with campers to sleep in. Some of the men did commute as the bulk of the crew were local or within reasonable access to the camp. The work week was shortened from 6 days a week to 5 1/2 to accommodate those who had to commute.

Merrill-Gardner (later Merrill-Wagner) continued operating the sawmill for about one year after moving into the Gavin Lake site. With road conditions improving, providing easier access to the large mills in Williams Lake, it was decided that the mill

would cease operations and be dismantled. At this time the old cookhouse, cabins and garage on the upper bench were burned, with a diesel generator being installed on the garage site.

When Merrill-Gardner bought All-Fir they were also operating a logging camp on Horsefly Lake, known as Camp #2. There had been new camp buildings erected at Camp #2 in 1961, including a cookhouse, washhouse, and seven or eight cabins. These buildings were moved to the new logging site at Gavin Lake, which became known as Camp #3.

The logging during this history was done in a checker-board fashion. The blocks were approximately 200 acres (80 ha) each in size with patches of reserve timber approximately 1,000 feet (300 m) wide being left between each block. These reserves were left to accommodate wildlife.

Some areas were logged leaving non-merchantable trees in place under "intermediate utilization standards". Most logging, however, was done in a clear-cut manner with broadcast burning to follow, in preparation for re-planting. The area north of camp does not look as planned in 1967 due to some problems in burning. As a result of escaped slash burns and subsequent salvage logging, many of the reserve blocks were lost, and a total area of approximately 860 ha was logged in one opening north of camp.

Merrill-Wagner logged in the Gavin Lake area from the early 1960s until 1985. The terrain surrounding Gavin Lake produced Douglas-fir, spruce, and pine, with the fir being of prime interest to Merrill-Wagner. They let the cedar stand as the wood was not profitable to harvest at that time.

The merchantable cedar stands that remained unlogged and unburned in the Gavin Lake area were logged by Starline Cedar from

about 1977 to 1984. In 1987 the UBC Alex Fraser Research Forest was created in the Gavin Lake area.

In the late 1960s and 1970s Jacobson Bros. Forest Products (latterly Riverside Forest Products and now Tolko Industries) were harvesting on the Beaver Valley slopes, and in the mid 1980s Weldwood of Canada opened up harvest areas at Choate Lake and Fire Lake.

Plantations of Douglas-fir and spruce were established in the Gavin Lake area as early as 1972. Early plantations were established using seed of unknown origin, and with little understanding of the ecological conditions of the area or the silvical characteristics of the species. Hence we have a legacy of poorly stocked areas with frost-damaged Douglas-fir and tip-weevil-damaged spruce.

As the years passed, with more men commuting to work on improved roadways, it was decided that running the camp was no longer necessary or profitable and the camp was closed in the early 1970s. In 1975, Merrill-Wagner (later Weldwood of Canada and now West Fraser Timber) offered the camp to the Canadian Forestry Association of BC (later called the BC Forestry Association), which had been looking for a suitable location to build a camp to carry out its programs of education and recreation. In 1996 the BC Forestry Association reorganized, and became Forest Education BC. At that time the camp was taken over by a local non-profit society called the Gavin Lake Forest Education Society. The camp continues to operate and provides educational experiences to school children of the Cariboo.

Starting in 1987, with the creation of the Research Forest, third-year forestry students from UBC have also called Gavin Lake camp their own. In 2006, the twentieth class

attended Fall Field School at Gavin Lake, and the history of the site contributes to the richness of their experience.

### ***History of UBC Management***

The original concept of developing a research forest in the Cariboo came from an economic development study commissioned by the Cariboo Regional District (CRD) in 1983. That study identified that a research forest would be an economic development opportunity. In pursuing some of the recommendations in the plan, Glen Laubenstein (CRD) approached Van Scoffield of the



Student exercise conducted on an old road adjacent to Gavin Lake Camp.

Cariboo Lumber Manufacturers (CLMA) to discuss options in this regard. The Alex Fraser Research Forest was thus created by the will of the people of the Cariboo. The committee struck to create the Research Forest included

the following members:

Glen Laubenstein, Cariboo Regional District  
Van Scoffield, Cariboo Lumber Manufacturers

Ethel Winger, Mayor, City of Williams Lake

John Szauer, Cariboo Forest Region

Jack Leggett, BC Environment

Laurie Wilson, Lignum Ltd.

John Mansell, Weldwood of Canada Ltd.

Gail Wallin, B.C. Forestry Association

The group approached Bob Kennedy, then Dean of Forestry at UBC, to determine if UBC was interested in participating. Kennedy accepted the invitation and Don Munro, Director of the UBC Research Forest, was given the task of representing UBC through the development.

The areas selected to become the Research Forest were picked from a variety of areas suggested by the committee. The principal consideration was to include a variety of climatic conditions. The area surrounding Gavin Lake was suggested because it includes two different biogeoclimatic zones, and because it was adjacent to the Gavin Lake Camp, operated by the B.C. Forestry Association. Members of the CLMA were quite keen to see the camp used more and the opportunities for UBC and BCFA to work together were viewed as being very positive. There was some concern about including the area south of the camp in the Research Forest because it is immediately surrounding camp, and the earliest maps show a large exclusion from the Research Forest South of Gavin Lake.

The Knife Creek mule deer winter range was already heavily invested in research by the Ministry of Forests Research Section. Harold Armleder (Regional Habitat Ecologist) suggested that Knife Creek be included as part of the Research Forest because it was an area of particular interest to him, and he probably saw the Research Forest as an opportunity to extend and continue his research about mule deer.

There was also discussion of including a block in the Chilcotin, and a block in the high elevation forests in the east. Eventually, however, the committee settled on just two blocks, with the thought that more could be added in the future if needed for financial viability.

The Research Forest developed very rapidly, and by January 1, 1987 a Resident Forester (Ken Day, RPF) was in place to begin development of the forest. The committee was successful at securing start-up funds from the Government of BC in the form of a lottery grant. The long-time MLA for the Cariboo, Alex Fraser, was pivotal in acquiring that grant. Dean Kennedy committed to fund the wages of the Resident Forester for a period of three years.

The intent was that the forest would remain Crown Land, and be managed according to the principles of integrated resource management.

Most of the effort of the new Resident Forester was devoted to “getting to know” the area, both literally in terms of the physical characteristics, as well as the less tangible concerns of working relationships, politics, and responsibilities. Nevertheless, six research files were opened in the first year, and the first timber harvest was accomplished in the second year of operation.

Since the inception of the Research Forest, the staff grew to more than 10 Full Time Equivalents in 2003. Declining external contracts, falling timber prices, and a failure to complete the annual harvest program in 2003/04 caused a financial crisis that led to a reduction of the Forest’s permanent staff complement by 2.5 FTEs. The seasonal staff complement fell from 1.5 FTEs to 0.6 FTEs.



Don Munro, Director of University Research Forests, presents a gift to Alex Fraser, MLA while Mrs. Gertrude Fraser looks on at the opening ceremony for the new UBC Alex Fraser Research Forest, April 1987.

### **Significant events 1987-2005**

- First fall field school for third year forestry students – 1987
- First timber harvest – 1988
- Tenure agreement established between UBC and the Crown – 1989
- First plantation established by the Alex Fraser Research Forest – 1992
- Management and Working Plan #1 submitted for approval – 1993
- Continuous mountain pine beetle infestation – 1993 to present
- Silviculture fund (accrued cash) converted to Endowment Account – 1995
- International interns program grew to a peak of 15 participants at two Research Forests – 1998
- 10<sup>th</sup> anniversary of the Alex Fraser Research Forest – January 1997
- 3 lightning strikes (first forest fires since establishment of Research Forest) - 1998
- Management and Working Plan #2 submitted for approval – 1998
- Snow breakage event at Gavin Lake – December 1998
- Purchased property at Knife Creek to build office complex – 1999
- Ken Day becomes Director, University Research Forests – 1999-2001
- Hosted a portion of UNBC field courses for 3rd year students – 1999-2002
- Samantha Hicks (researcher) memorial established at Gavin Lake – 1999
- Faculty budget support fell to zero – 2000
- International interns program was rationalized, and fell to a low of 2 participants – 2000
- Western Spruce Budworm infestation begins at Knife Creek – 2000
- Total Forest Renewal BC funding was \$1,313,480.00 – 1995 – 2001
- The position of Director was eliminated; Research Forest Managers report to the Dean and take advice from the Research Forest Advisory Committee – 2001
- Appointed Canadian Overseas Log and Lumber as our log broker – 2001
- 50<sup>th</sup> anniversary of Faculty of Forestry alumni celebration at F351 – August 2001
- First block harvested by the Alex Fraser Research Forest declared free growing – 2001
- 30,000 m<sup>3</sup> harvested due to mountain pine and Douglas-fir bark beetles. Largest cut in history of Research Forest – 2001/02
- Spruce bark beetle infestation increasing – 2001
- Significant windthrow event – October 2003
- Mountain pine beetle attack nearing 100% mortality in 125-year-old stands, causing substantial mortality in 70-year-old stands, and also killing 40-year-old trees at Knife Creek – 2004
- Unexpected revenue shortfall fiscal year 03/04 caused financial crisis, and resulted in layoffs and curtailed spending – 2004
- Endowment account principle liquidated to recover from revenue shortfall in 03/04 – 2005
- Mountain pine beetle mortality underway in 24 year old plantation at Gavin Lake – 2005
- Cooperated on committee to produce the *Williams Lake and Area Interface Fire Plan* – 2004/05

## Full Time Staff Appointments (beginning – ending)

Don Munro, Director – 1987-1995

Ken Day, Resident Forester, Manager,  
Director, Manager – 1987-Present

Bev Atkins, Silviculture Administrator  
– 1989-2004

Claire Trethewey, Research  
Forester – 1992-2004

Don Skea, Operations  
Supervisor – 1994-Present

Dawn Lowe, Office  
Administrator – 1995-Present

Peter Sanders, Director  
– 1995-1999

Mircea Rau, Planner – 1996-  
Present

Laura Smith, Forestry Intern  
– 1999-2000

Beverley Moore,  
Administrative Assistant  
– 2000-2004

Matthew LeRoy – Forestry  
Intern – 2000-2001

Cathy Koot, Extension Coordinator, Research  
Coordinator – 2001-Present

Jeff Jensen – Forestry Intern – 2001-2002

Sean Seabourn, Forestry Intern – 2002-2003

Kim Menounos, Forestry Intern – 2002-2003

Jacqueline Cavill, Forestry Intern – 2003

Angela Cormano, Forestry Intern – 2003-04

## Harvest History

Since 1987 we have concentrated our harvesting on stands at risk from attack by mountain pine beetle. Our first blocks in 1988 contained some pine beetle-attacked

trees, and since 1993 the large majority of our harvest has been directed towards pine beetle-attacked stands (Figure 2). In 1997 and again in 1998 we had winter storms that broke a lot of timber at Gavin Lake, and harvesting in 2000-2002 focused on that damage in addition to pine beetle attack.

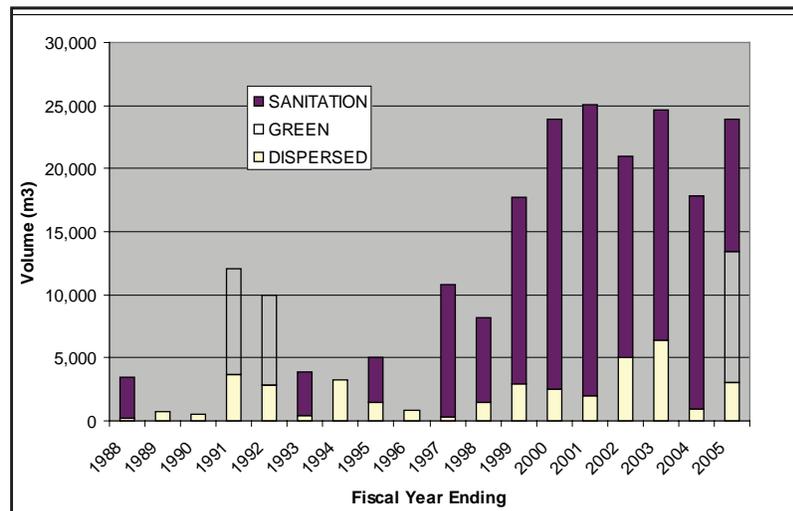


Figure 2: Annual harvest levels for the Alex Fraser Research Forest. Sanitation includes any cutblock aimed at damaged timber; dispersed includes timber harvested outside cutblocks; and green refers to cutblocks aimed at undamaged timber.

Management and Working Plan #1 established our allowable annual cut (AAC) at 5,435 m<sup>3</sup>/year. In 1998 the AAC was increased to 6,200 m<sup>3</sup>/year, to include deciduous and grade 3 sawlog volumes. In 1999 the Regional Manager waived our cut control, in effect giving us a free hand to harvest as much volume as necessary in order to manage our growing bark beetle infestation and to salvage damaged timber.

Figure 3 shows the change in inventory from 1997 to 2004. It shows that the Research Forest inventory has aged, with decreases in age class 6 (100-120 years) at Gavin Lake and age class 7 (120-140 years) at Knife Creek, and corresponding increases in age classes 7 and 8 respectively. At the same

time the area occupied by lodgepole pine as the leading species has decreased and that of Douglas-fir has increased. These changes in the inventory are a direct result of our mountain pine beetle management strategy. It emphasized removal of lodgepole pine and retaining Douglas-fir. After partial cutting the age of the residual stand has not changed if the next harvest will be the residual Douglas-fir, but the species composition has changed. On this basis the inventory has been adjusted for the post-harvest condition.

Log selling prices and logging costs have varied over time, according to market forces in the interior sawmills and competitiveness

in the logging industry respectively. Figure 4 shows the average market value of log sales since 1988, adjusted for inflation to 2005 values. Rising logging costs and falling selling prices have caused significant budgetary pressures, and these trends present a real risk to the financial stability of the Research Forest. Our responses to these trends have included

- Increasing production
- Appointing a log broker, to improve selling prices

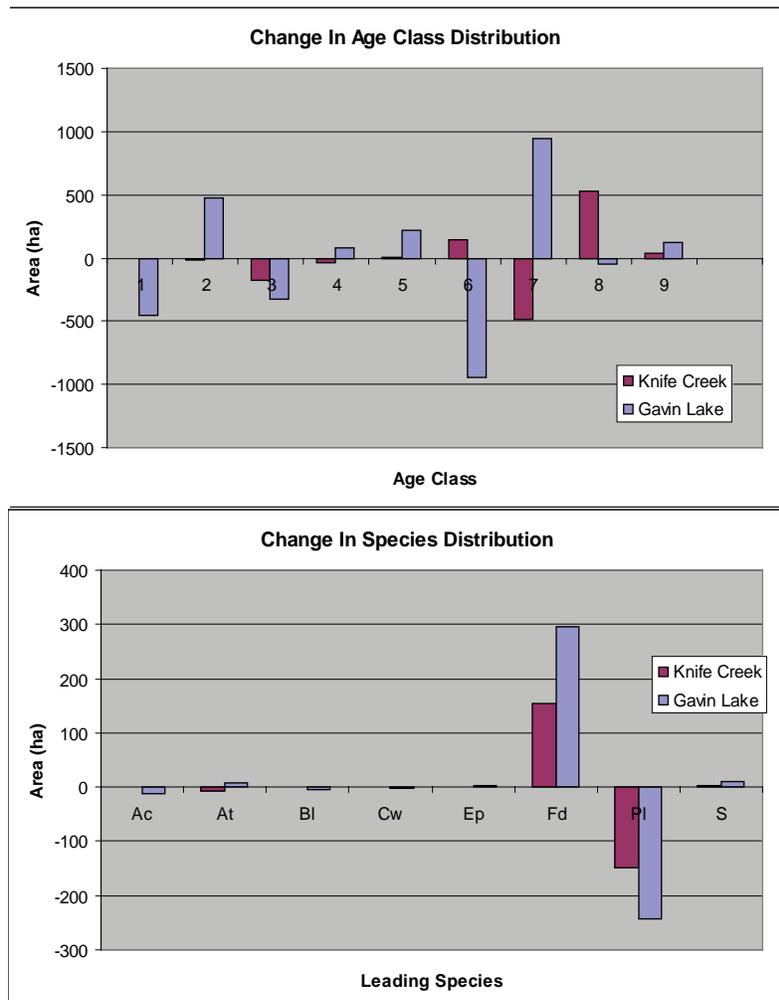


Figure 3: 1997 to 2004 change in age class and species distribution for the Alex Fraser Research Forest. Note changes in species composition resulting from partial-cutting to manage mountain pine beetle.

- Increasing clearcutting in the annual harvest program to reduce production costs
- Focusing on higher-value products to increase average market values
- Working with loggers to improve their efficiency and reduce production costs

Additional steps are necessary to reduce our production costs and increase our average market value for log sales. We will continue to pursue opportunities to sell our high-grade logs for higher-value products.

Traditionally our harvest program has been concentrated into the winter season, to take advantage of frozen ground. This approach has several advantages and disadvantages:

#### Advantages

- Reduced road construction and maintenance costs
- Reduced soil degradation from logging equipment
- Reduced damage to residual trees in partial-cutting
- Selling logs when mills are short of inventory

#### Disadvantages

- Compressed operating season
- Shortage of loggers and truckers
- Risk of warm weather, lack of frost
- Road weight restrictions increase trucking costs
- Not logging when high-value markets may be available.

Since 2003 we have been working to increase our summer logging production, but in 2004/05 we only managed to produce 15% of our logs between May and October, and 85% from November through March. At the time of writing it appears that summer/fall production has increased to 28% for 2005/06, and 14% for 2006/07. We need to actively pursue options for increasing our harvest during the summer/fall period.

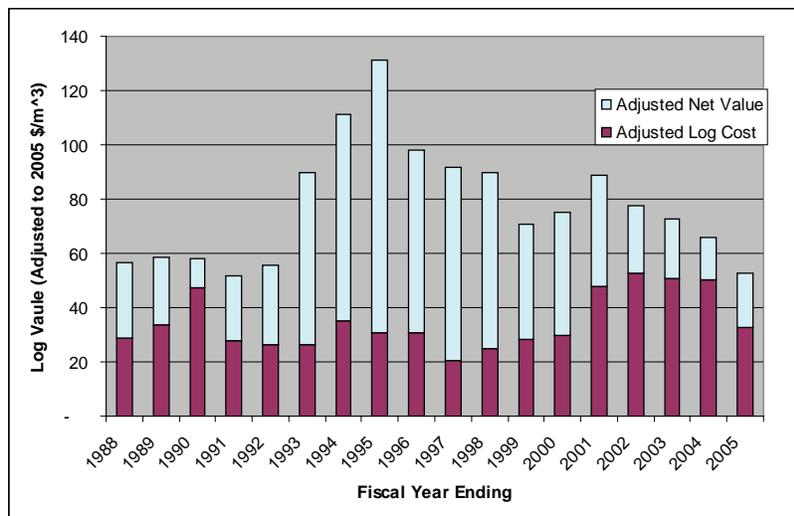


Figure 4: Average market value of log sales from the Alex Fraser Research Forest, comparing average production cost and net value, adjusted to 2005 dollars.

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### **Appendix 1. Research Projects Established 1987-2007 (up to June 8, 2007)**

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- 1 Project No: N/A  
Title: Incremental silviculture of young lodgepole pine - precommercial thinning and repeated fertilization  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.1.1993  
Researcher: Pontus Lindgren  
Title: Forest fuel management for community protection at Knife Creek: potential fire behavior  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.1.2006  
Researcher: Dave Schroeder
- 2 Project No: 2007-09  
Title: Extending the logging season in Mountain Pine Beetle damaged stands by using ground wood to surface in-block roads  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.4.2007  
Researcher: Kevin Lyons
- 3 Project No: 2007-08  
Title: Understanding the spatial and quality attributes of culturally important non-timber forest product species in mountain pine beetle affected areas of the Cariboo-Chilcotin  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.4.2006  
Researcher: Wendy Cocksedge
- 4 Project No: 2007-07  
Title: Provincial Species Selection Guide Update Project  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.3.2007  
Researchers: Bryce Bancroft, Ken Day, Karel Klinka, Richard Lay, Steve Mitchell, Ken Zielke
- 5 Project No: 2007-06  
Title: Balancing disturbances in forest management  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 30.3.2007  
Researcher: Vince Nealis
- 6 Project No: 2007-05  
Title: Knive Creek Agricultural Water Use Assessment  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.6.2005  
Researcher: Katharine VanSpall
- 7 Project No: 2007-04  
Title: Simulation of IDF stand structure for the purpose of testing prescription and survey methods.  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.4.2007  
Researchers: Ken Day, Craig Farnden, Bruce Larson
- 8 Project No: 2007-03  
Title: Linking AFRF wetlands to the Canadian Wetland Inventory  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 26.1.2007  
Researchers: Cathy Koot, Kathleen Moore
- 9 Project No: 2007-02  
Title: Investigating a Best Management Practice for cleaning of heavy equipment to reduce spread of invasive plants  
Forest: Alex Fraser Research Forest  
Start date: 26.1.2007  
Researchers: Cathy Koot, Don Skea
- 10 Project No: 2007-01  
Title: Outdoor Digital Media Longevity Monitoring  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest
-

- Start date: 20.12.2006  
Researchers: Cathy Koot, Gary Mann
- 12 Project No: 2006-12  
Title: Silvae  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 1.7.2006  
Researcher: Laurie McGugan
- 13 Project No: 2006-11  
Title: Rehabilitation using native  
groundcover seed  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: 15.5.2006  
Researcher: Cathy Koot
- 14 Project No: 2006-10  
Title: Rating options for postattack cutting  
on affected stands  
Forest: Alex Fraser Research Forest  
Start date: 1.4.2006  
Researchers: Rasmus Astrup, Kirstin Campbell,  
Bruce Larson
- 15 Project No: 2006-09  
Title: Regeneration under different partial  
cut silvicultural systems  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 7.1.2006  
Researchers: Mariano Amoroso, Bruce Larson
- 16 Project No: 2006-08  
Title: Development of a Field Portable  
Spectrometer to Measure Wood Properties in  
MPB Attacked Trees  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 1.9.2004  
Researcher: Esther Hsieh
- 17 Project No: 2006-07  
Title: Hypholoma as Biocontrol for  
Tomentosis  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 24.2.2006
- 18 Project No: 2006-06  
Title: Sampling for Regeneration Following  
Mountain Pine Beetle Attack  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: 5.6.2006  
Researcher: Peter Marshall
- 19 Project No: 2006-05  
Title: Breeding bird habitat monitoring  
for the Space for Habitat project (Environment  
Canada)  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: 17.5.2006  
Researchers: Kathy Martin, Brenda Morehouse
- 20 Project No: 2006-04  
Title: Grassland restoration using fencing  
and fertilizer  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: 9.8.2005  
Researchers: Bill Chapman, Cathy Koot
- 21 Project No: 2006-03  
Title: Monitoring operational fertilization in  
mid-aged Douglas-fir and Spruce stands.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 7.4.2006  
Researchers: Guy Burdikin, Ken Day, Cathy  
Koot, John Stace-Smith
- 22 Project No: 2006-02  
Title: Modelling regeneration following  
MPB-attack  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: 1.9.1996  
Researcher: Val LeMay
- 23 Project No: 2006-01  
Title: Testing product made from harvesting  
waste  
Forest: Alex Fraser Research Forest  
Start date: N/A
-

- Researcher: Bill Griffin
- 24 Project No: 2005-21  
Title: Solid wood fuel from forest and small mill waste  
Forest: Alex Fraser Research Forest  
Start date: 1.1.2005  
Researchers: Ken Day, Don Skea
- 25 Project No: 2005-20  
Title: Evaluation of Beetle-Killed Hybrid Spruce for Bioethanol and Co-Products  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.2.2006  
Researchers: Alex Berlin, Jack Saddler
- 26 Project No: 2005-19  
Title: Sorption study of interior spruce (*Picea engelmanni* x *glauca*)  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.4.2005  
Researchers: Stavros Avramidis, Anteneh Tesfaye
- 27 Project No: 2005-18  
Title: Management Planning Pilot Project  
Forest: Alex Fraser Research Forest  
Start date: 17.11.2005  
Researchers: Ken Day, Mircea Rau, Kathie Swift
- 28 Project No: 2005-17  
Title: Time and motion study of a fuel reduction treatment in the IDFxM at Knife Creek.  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.12.2005  
Researchers: Ken Day, Janet Mitchell
- 29 Project No: 2005-16  
Title: Bleaching and Finishing of Mountain Pine Beetle Affected Lodgepole Pine Wood  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.10.2005  
Researchers: Muhammed Chowdhury, Phil Evans
- 30 Project No: 2005-15  
Title: Examining causal factors in windthrow experienced after partial cutting.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.10.2005  
Researchers: Ken Day, Mircea Rau
- 31 Project No: 2005-14  
Title: Mule Deer Winter Range Harvesting Assessment  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.9.2005  
Researcher: Chris Nowotny
- 32 Project No: 2005-13  
Title: Establishing which decay fungi degrade wood fibres at a higher rate in standing lodgepole pine killed by Mountain Pine Beetle  
Forest: Alex Fraser Research Forest  
Start date: 1.9.2005  
Researcher: Jae-Jin Kim
- 33 Project No: 2005-12  
Title: Examining the economic impact of mountain pine beetle mortality in juvenile stands.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 27.8.2005  
Researchers: Ken Day, Bruce Larson
- 34 Project No: 2005-11  
Title: Unexplained mortality of regeneration in opening 93A042-339.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.1.1998  
Researchers: Ken Day, Claire Trethewey
- 35 Project No: 2005-10  
Title: Permanent sample plots for measuring growth and yield of the single tree selection silvicultural system on block 112.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 1.9.1996  
Researchers: Ken Day, Mircea Rau
-

- 36 Project No: 2005-09  
Title: Effect of shelterwood Harvest on Black Huckleberry (*Vaccinium membranacem*) Production in Douglas-fir (*Pseudotsuga menziesii*) Forests in the Sub-Boreal Spruce Zone  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 13.6.2005  
Researchers: Sally Sellars, Suzanne Simard
- 37 Project No: 2005-08  
Title: Cavity nester use and structure availability field exercise for F351  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 4.7.2005  
Researchers: Cathy Koot, Kathy Martin
- 38 Project No: 2005-07  
Title: Public Perceptions of Mountain Pine Beetle Management Alternatives  
Forest: Alex Fraser Research Forest  
Start date: 9.6.2005  
Researchers: Brent Chamberlain, Mike Meitner
- 39 Project No: 2005-06  
Title: Field protocol testing for ant monitoring  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 12.5.2005  
Researcher: Rob Higgins
- 40 Project No: 2005-05  
Title: Testing of the Efficacy of 3-Methyl-2-cyclohexene-1-one (MCH) Anti-aggregation Pheromone for Dispersal and Elimination of Isolated Infestations of Douglas-fir Beetle in Old Growth Management Areas and Reserves  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 9.5.2005  
Researchers: Ken Day, Cathy Koot, Leo Rankin
- 41 Project No: 2005-04  
Title: Learning to use prescribed fire for fuel management  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 31.3.2003  
Researchers: Ken Day, Phil Ranson, Don Skea
- 42 Project No: 2005-03  
Title: Performance of ponderosa pine planted north of its natural range.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 3.1.2005  
Researchers: Ken Day, Wayne Nuyens
- 43 Project No: 2005-02  
Title: Developing products for small Douglas-fir logs  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.1.2003  
Researcher: Ken Day
- 44 Project No: 2005-01  
Title: Comparison of Myrtle and Audubon's Yellow-rumped Warblers  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: 21.4.2005  
Researchers: Alan Brelsford, Darren Irwin
- 45 Project No: 2004-10  
Title: Effectiveness of Nordlander pitfall traps for ants, with comparison to standard sampling methods.  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 6.1.2003  
Researcher: Rob Higgins
- 46 Project No: 2004-09  
Title: Mountain pine beetle collection  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.7.2004  
Researcher: Staffan Lindgren
- 47 Project No: 2004-08  
Title: Fungal survey from interior decayed Western Red Cedar and Douglas fir trees

Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 1.8.2004  
Researchers: Russell Chedgy, Young Woon Lim

48 Project No: 2004-07  
Title: A wood and fibre quality deterioration  
model for mountain pine beetle infested trees by  
BEC subzone  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 1.9.2004  
Researcher: Tennessee Trent

49 Project No: 2004-06  
Title: Cost estimates for harvesting small  
roundwood.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: 29.7.2004  
Researcher: Ken Day

50 Project No: 2004-05  
Title: Implementation of STRIP:  
Silvicultural Treatment Rationalization Initiative  
Project  
Forest: Alex Fraser Research Forest  
Start date: 28.7.2004  
Researchers: Ken Day, Kathie Swift

51 Project No: 2004-04  
Title: Bark beetle infestation of juvenile  
lodgepole pine  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: 31.5.2004  
Researchers: Ken Day, John McLean

52 Project No: 2004-03  
Title: Effects of forestry on fish ecology,  
physiology and habitat  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Eric Mellina

53 Project No: 2004-03  
Title: BC University Research Forests  
Integrated Research Project Database

Forests: Alex Fraser Research Forest, Aleza  
Lake Research Forest, John Prince Research  
Forest, Malcolm Knapp Research Forest  
Start date: 21.1.2004

54 Project No: 2004-03  
Title: BC university research forest  
integrated research project database  
Forests: Alex Fraser Research Forest, Aleza  
Lake Research Forest, John Prince Research  
Forest, Malcolm Knapp Research Forest  
Start date: 1.1.2004  
Researcher: Melanie Karjala

55 Project No: 2004-02  
Title: Ecosystem mapping of Cariboo  
woodlots  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: 1.6.2004  
Researcher: Ray Coupe

56 Project No: 2004-01  
Title: Interior University Research Forests  
Bear Den Inventory  
Forests: Alex Fraser - Gavin Lake, Alex  
Fraser - Knife Creek, Alex Fraser Research  
Forest, Aleza Lake Research Forest, John Prince  
Research Forest  
Start date: 21.4.2005  
Researchers: Dexter Hodder, Cathy Koot

57 Project No: 2003-08  
Title: Permanent Photo-points Depicting  
Effects of Forest Management  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 15.1.2003  
Researcher: Ken Day

58 Project No: 2003-07  
Title: University Research Forests Integrated  
Research Program Database  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ionut Aron, Dexter Hodder,  
Melanie Karjala, Cathy Koot

- 59 Project No: 2003-06  
Title: Fertilizing in high density lodgepole pine stands  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: David Brisco, Karel Klinka
- 60 Project No: 2003-05  
Title: Wood product potential of Douglas-fir thinnings from overstocked uneven-aged stands  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Ken Day
- 61 Project No: 2003-02  
Title: Effects of mountain pine bark beetle attack on pulp properties and processing  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: James Drummond, Paul Watson
- 62 Project No: 2003-01  
Title: Linking stand management regimes with stand structure classification system in uneven-aged dry-belt Douglas-fir forests  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Dave Conly, Ken Day, Peter Marshall
- 63 Project No: 2002-21  
Title: Investigation of mountain pine beetle and associated pathogenecity.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A
- 64 Project No: 2002-20  
Title: Stocking assessment method for complex stands  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Pat Martin, Kim Peel
- 65 Project No: 2002-19  
Title: Dry-belt Douglas-fir commercial thinning lumber recovery study  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Guenter Weckerle
- 66 Project No: 2002-18  
Title: Dry-belt Douglas-fir commercial thinning timing trial  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Janet Michell
- 67 Project No: 2002-17  
Title: Pre and post commercial thinning dry-belt Douglas-fir fuel and fire behavior assesement  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Robert Gray
- 68 Project No: 2002-16  
Title: Cattle grazing impacts on restored landings  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Maja Krzic, Reg Newman
- 69 Project No: 2002-15  
Title: Growth and yield implications of managing for mule deer winter range in dry IDF forests  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Femke Dolstra, Bruce Larson
- 70 Project No: 2002-14  
Title: Use of fire in dry interior Douglas-fir forests  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Ken Day
-

- 71 Project No: 2002-13  
Title: Criteria and Indicators of Joint Forest Management  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Gail Fondahl, Erin Sherry
- 72 Project No: 2002-12  
Title: Feasibility test of fir removal targets in Cariboo Region mule deer winter range type 3 harvest strategy  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Sean Meisner
- 73 Project No: 2002-11  
Title: Climate Change Impacts and Adaptation  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Hamish Kimmins
- 74 Project No: 2002-10  
Title: Gavin Lake Ecosystem Mapping  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Karel Klinka, Claire Trethewey
- 75 Project No: 2002-09  
Title: Knife Creek Ecosystem Mapping  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 1.6.2002  
Researchers: Ken Day, Karel Klinka, Claire Trethewey
- 76 Project No: 2002-07  
Title: Some solutions to the Mountain Pine Beetle Epidemic -- A Value Chain Approach  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: John Innes
- 77 Project No: 2002-06  
Title: Wildlife Habitat Assessment Tool  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Joanna Dawlings, Susan Leech
- 78 Project No: 2002-05  
Title: Evolutionary consequences of clonal reproduction in trembling aspen (*Populus tremuloides*).  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Dilara Ally, Kermit Ritland
- 79 Project No: 2002-04  
Title: Management planning for university research forests  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Jennifer Brickey
- 80 Project No: 2002-03  
Title: *Populus tremuloides* - genetics and wood properties  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Shawn Mansfield
- 81 Project No: 2002-02  
Title: Biomass energy conversion - utilising thinnings  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 22.12.2006  
Researchers: Gary Bull, Ken Day
- 82 Project No: 2002-01  
Title: First Nations Culture and the Forested Landscape  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: John Lewis, Stephen Sheppard
- 83 Project No: 2001-19  
Title: Stand level modelling of various silviculture systems in the SBSdw1  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

- Start date: N/A  
Researchers: Hamish Kimmins, Jennifer Turner
- 84 Project No: 2001-18  
Title: Small Woodlands Program  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Chris Hollstedt, Cathy  
Koot, Claire Trethewey
- 85 Project No: 2001-17  
Title: POSSIBLE FOREST FUTURES for  
land use planning  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Hamish Kimmins
- 86 Project No: 2001-16  
Title: A Guidebook for Improving  
Aboriginal Participation in Forest Management  
Decision Making  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Melanie Karjala, Erin Sherry,  
Dewhurst Stephen, Claire Trethewey
- 87 Project No: 2001-15  
Title: Remote Sensing of Forest Health  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Jeff Alexander, Peter Murtha,  
Rajeev Sharma
- 88 Project No: 2001-14  
Title: VRI plot for Williams Lake timber  
supply analysis  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Eric Johansen, Gregor Lee,  
Kristina Luke-Airey, Nona Philips
- 89 Project No: 2001-13  
Title: The effects of light on regeneration  
performance in partially cut stands  
Forest: Alex Fraser Research Forest
- Start date: N/A  
Researcher: John Barker
- 90 Project No: 2001-12  
Title: Past Fire Regimes in the IDFdk3  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, Kristi Iverson
- 91 Project No: 2001-11  
Title: Testing bark beetle pheromones,  
host volatiles, and beetle produced volatiles as  
attractants and repellents  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: John Borden, Deepa Pureswaran
- 92 Project No: 2001-10  
Title: Coarse woody debris requirements for  
ant fauna in the IDF and SBS  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Rob Higgins
- 93 Project No: 2001-09  
Title: Effects of nursery mature needle  
production on stem form in lodgepole pine  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Bev Atkins, Claire Trethewey
- 94 Project No: 2001-08  
Title: Implementing Prognosis BC at the  
tactical and operational level  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Kieth Dufresne, Jim  
Kirkpatrick, Claire Trethewey, Phil Winkle
- 95 Project No: 2001-07  
Title: Acceptability of cedar regeneration in  
the ICH  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest
-

- Start date: N/A  
Researchers: Ken Day, Claire Trethewey
- 96 Project No: 2001-06  
Title: Seral Attributes In the Interior Douglas-fir Forests  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Rick Dawson, Melanie Karjala, Ordell Steen
- 97 Project No: 2001-05  
Title: Remote sensing and vareigated magenta theory for mountain pine beetle detection  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Peter Murtha, Dan Stebbens
- 98 Project No: 2001-04  
Title: Stem analysis of growth response to shelterwood cutting  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Steve Mitchell
- 99 Project No: 2001-03  
Title: Development and extension of management tools for small-scale forestry  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Rod Blake, Ken Day, Brian McNaughton, Jane Perry
- 100 Project No: 2001-02  
Title: Seed class demonstration planting  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A
- 101 Project No: 2001-01  
Title: Reconstruction of historical forest conditions  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest
- Start date: N/A  
Researchers: Stephen Dewhurst, Michelle McGregor
- 102 Project No: 2000-19  
Title: NRIN - Natural Resources Information Network  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ionut Aron, Trina Innes, Claire Trethewey
- 103 Project No: 2000-18  
Title: Effects of grazing on vegetation and soil quality  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Maja Krzic
- 104 Project No: 2000-17  
Title: Productivity and cost analysis of tree marking for various partial cutting retention levels  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Michelle Dunham, Janet Michell
- 105 Project No: 2000-16  
Title: Seasonal Use and Habitat Selection of Moose in Wetland/Riparian Habitats and Adjacent Forested Areas  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Peter Arcese, Bruce Catton, Youds John, Randy Wright
- 106 Project No: 2000-15  
Title: Using indiginous knowledge to support sustainable forest management  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Mark Hamm, Claire Trethewey
-

- 107 Project No: 2000-14  
Title: Effects of commercial thinning on range and wildlife forage production in drybelt fir stands  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Harold Armleder, Rick Dawson, Ken Day, Cathy Koot, Claire Trethewey
- 108 Project No: 2000-13  
Title: Remote Sensing for detection of mountain pine beetle green attack  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Robin Brown, Val Fletcher, Jamie Heath, Leo Rankin
- 109 Project No: 2000-12  
Title: Overstory/Understory Interactions  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Steve Mitchell, Rod Negrave
- 110 Project No: 2000-11  
Title: Effects of spacing on western spruce budworm infestation and damage in the IDF  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Jeff Jensen, Joan Westfall
- 111 Project No: 2000-10  
Title: Knife Creek growth response to management - paired plot monitoring program  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Claire Trethewey
- 112 Project No: 2000-09  
Title: Benefits of compacting forest road subgrade at the time of construction  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Don Skea
- 113 Project No: 2000-08  
Title: Natural durability of western red cedar  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Bob Daniels, Paul Morris
- 114 Project No: 2000-07  
Title: Effects of modified light and temperature on stream ecology  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Charlotte Gjerlov, John Richardson
- 115 Project No: 2000-06  
Title: Utilising small diameter Douglas-fir commercial thinnings for pulpwood  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Tony Sauder, Paul Watson
- 116 Project No: 2000-05  
Title: Biological control of *Phellinus*  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Bill Chapman
- 117 Project No: 2000-04  
Title: Incorporating risk into environmental impact assessment systems and forest management plans  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Pablo Cerda Juan, Steve Mitchell
- 118 Project No: 2000-03  
Title: Wetbelt mule deer winter range silviculture options  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Karen Campbell, Simon Liddell, Steve Mitchell
- 119 Project No: 2000-02
-

Title: Seasonal extractives variation in hybrid white spruce, lodgepole pine, and subalpine fir.

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Shanley Pitts, Paul Watson

120 Project No: 2000-01

Title: Developing Methodology for Implementation of Commercial Thinning Treatments in Dry-belt Douglas-fir Stands on Mule Deer Winter Range in the Cariboo Forest Region

Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researchers: Harold Armleder, Rick Dawson, Ken Day

121 Project No: 1999-13

Title: Mule Deer Winter Range Strategy - Integration Project

Forest: Alex Fraser Research Forest

Start date: N/A

Researchers: Ken Day, Gord Rattray

122 Project No: 1999-12

Title: Woodlot Pilot Project - Results Based Code

Forest: Alex Fraser Research Forest

Start date: N/A

Researchers: Rod Blake, Ken Day, Brian McNaughton

123 Project No: 1999-11

Title: Commercial thinning in the ICHmk3

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Ken Day, Guy Newsome

124 Project No: 1999-10

Title: Grassland encroachment

Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researcher: Susan Glenn

125 Project No: 1999-09

Title: Mine Site Reclamation

Forest: Alex Fraser Research Forest

Start date: N/A

Researcher: Greg Smyth

126 Project No: 1999-08

Title: A comparison of stump vs. regular planting on moisture limited sites

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researcher: Ruth McArthur

127 Project No: 1999-07

Title: Raptor nests and listed bird species on the Alex Fraser Research Forest

Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researcher: Laura Smith

128 Project No: 1999-05

Title: Real-time visualization tool - prototype development

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Duncan Cavens, Stephen Sheppard

129 Project No: 1999-04

Title: Critical periods of aspen competition control - effects on crop tree growth

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researcher: Phil Comeau

130 Project No: 1999-02

Title: Comparing species for pulpwood chipping

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Paul Bicho, Paul Watson

131 Project No: 1999-01

Title: Testing repellent volatiles in mountain pine beetle infected trees

Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: John Borden, Dezene Hubert

Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Yves Clareau, Phillip Comeau,  
Chrisian Messier

132 Project No: 1998-15  
Title: Mountain pine beetle detection using  
remote sensing  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Jayme Heath, John McLean, Peter  
Murtha, Leo Rankin

138 Project No: 1998-09  
Title: Dynamics of Spruce Weevil Attack in  
Interior Spruce Plantations  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Rene Alfaro, John McLean, Lara  
Payne, Claire Trethewey

133 Project No: 1998-14  
Title: Interior Douglas-fir growth and yield  
modelling  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Dave Conly, Ken Day, Ian Moss

139 Project No: 1998-08  
Title: Composting animal and wood waste  
for forest fertilizer  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Dave Fernie

134 Project No: 1998-13  
Title: Field verification of forest cover  
stratification  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Gregor Lee, Nona Philips

140 Project No: 1998-07  
Title: Integrating First nations into Resource  
Planning with GIS  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: John Lewis, Stephen Sheppard

135 Project No: 1998-12  
Title: Genetic effects of high grading in  
interior Douglas-fir and spruce stands  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Sally Aitken

141 Project No: 1998-06  
Title: Visual quality modelling of partial  
cutting near Gavin Lakes  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, Stephen Sheppard

136 Project No: 1998-11  
Title: Neighbourhood relationships in  
uneven-aged dry belt fir.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Ordell Steen

142 Project No: 1998-05  
Title: Growth response to harvesting entries  
and juvenile spacing in unven-aged interior  
Douglas-fir stands.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, Dalcyce Dobson, Peter  
Marshall, Claire Trethewey

137 Project No: 1998-10  
Title: Acclimations of forest tree seedlings  
to light intensity

143 Project No: 1998-04

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Title: Biological Control of Fireweed  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Sam Hicks, Judy Meyers, Simon  
Shamoun

144 Project No: 1998-02  
Title: Biological Control of Mistletoe  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Tod Ramsfield, Simon Shamoun,  
Bart van der Kamp

145 Project No: 1998-01  
Title: Biological versus mechanical control  
of Armillaria after harvesting  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Bill Chapman

146 Project No: 1997-09  
Title: Multi-scale landscape interactions  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Mark Perdue

147 Project No: 1997-08  
Title: The effects of forest development  
on some some plants with high first nations  
traditional use values.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Leila Sumi, Jean Williams

148 Project No: 1997-07  
Title: Forest Genetics -- Realized gain  
demonstration planting  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Sally Aitken

149 Project No: 1997-06

Title: EMAN-Ecological Monitoring and  
Assesment Network  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Susan Leech

150 Project No: 1997-05  
Title: Clonal Structure of Armillaria  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Jeremy Dettman, Bart van der  
Kamp

151 Project No: 1997-03  
Title: Siberian Larch growth and  
performance trial  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A

152 Project No: 1997-02  
Title: Nitrate and ammonium uptake in  
forest seedlings - preferences and site interactions  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Rob Guy

153 Project No: 1997-01  
Title: Growth loss in weevil attacked spruce  
plantations  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Daniel Barker

154 Project No: 1996-10  
Title: Transfer of forestry research  
information: A Pilot Project  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Tom Rankin, Lynda Wilson

155 Project No: 1996-09  
Title: Logging Load Recorder  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest

- Start date: N/A  
Researchers: Marv Clarke, Ken Day
- 156 Project No: 1996-08  
Title: GIS for higher level planning on AFRF  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Jeff Hayward
- 157 Project No: 1996-07  
Title: Bioherbicide for *Rubus - Fusarium avenaceum*  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Simon Shamoun
- 158 Project No: 1996-06  
Title: Relationship between forking and planting depth in young lodgepole pine plantations  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 159 Project No: 1996-05  
Title: Incremental silviculture in interior Douglas-fir stand  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 160 Project No: 1996-04  
Title: Stream benthos response to riparian management  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: John Richardson
- 161 Project No: 1996-03  
Title: Monsanto herbicide/conifer damage trial  
Forest: Alex Fraser Research Forest  
Start date: N/A
- 162 Project No: 1996-02  
Title: Sport Fisheries-Adaptive Management  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Francois Landry, Jack Leggett, Carl Walters
- 163 Project No: 1996-01  
Title: Pulping, pulp and fibre properties of interior BC spruce/pine/fir mixtures.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Paul Watson
- 164 Project No: 1995-92  
Title: Building Capacity to Reduce Interface Fire Risk  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 165 Project No: 1995-14  
Title: Remote sensing - landscape modelling  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Wolfgang Vrzal
- 166 Project No: 1995-13  
Title: Bat research - Gavin Lake  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Anna Roberts, Gina Roberts, Jim Young
- 167 Project No: 1995-12  
Title: Development of Canadian plantation hardwoods  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Ken Hunt
- 168 Project No: 1995-11
-

Title: Comparison of cottonwood whips with rooted naturals to restock wetter NSR strata  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot

169 Project No: 1995-10  
Title: Suitability of using under utilised species for pulp and paper - Subalpine fir  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Paul Watson

170 Project No: 1995-09  
Title: Pinosylvin animal repellent trial to reduce small mammal damage  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Pontus Lindgren, Tom Sullivan

171 Project No: 1995-08  
Title: Regression analysis with remote sensing data  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Peter Murtha

172 Project No: 1995-07  
Title: Visual Impact Modelling - Gavin Lake  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Jennifer Morrison

173 Project No: 1995-06  
Title: Modelling riparian corridors as linkages  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Susan Glenn

174 Project No: 1995-05  
Title: Spruce weevil permanent sample plots  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A  
Researcher: Leo Rankin

175 Project No: 1995-04  
Title: Forensic entomology - burial  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Gail Anderson, Sherah VanLaerhoven

176 Project No: 1995-03  
Title: Forensic entomology - above ground  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Gail Anderson, Leigh Dillon

177 Project No: 1995-02  
Title: Road and landing restoration - An access management strategy  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Ken Day

178 Project No: 1995-01  
Title: Relationship between incidence of aphid tending ants and spruce weevil attack levels  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Rob Higgins

179 Project No: 1994-18  
Title: Spread and incidence of *Inonotus tomentosus* in various planted tree species after logging  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A

180 Project No: 1994-17  
Title: Vole damage control with alternative food source  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Don Reid, Tom Sullivan

- 181 Project No: 1994-15  
Title: Natural and Managed Disturbance Patterns and Implications for Biodiversity Management in the IDF Zone: Phase 3, Wildlife Diversity  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: 5.1.1994  
Researchers: Harold Armleder, Michaela Waterhouse  
Start date: N/A  
Researchers: Rick Dawson, Jerry Dobry, Ordell Steen
- 182 Project No: 1994-14  
Title: Characterization of the wood quality of lodgepole pine with respect to wood composites  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Simon Ellis
- 183 Project No: 1994-13  
Title: Limiting vole population size by predation enhancement  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Maria Leung, Don Reid
- 184 Project No: 1994-12  
Title: Impact of logging activity on local ant populations  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Rob Higgins
- 185 Project No: 1994-11  
Title: RTI fertilizer trials  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Neil Anderson
- 186 Project No: 1994-10  
Title: Fire periodocity, stocking and regeneration in the IDF  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest
- 187 Project No: 1994-09  
Title: Control of spruce terminal weevil with neem seed extract  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Naumann, Leo Rankin
- 188 Project No: 1994-08  
Title: Comparison of Pli copper treated and untreated plug seedling growth within the SBS  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 189 Project No: 1994-07  
Title: Spruce weevil effects on lumber recovery  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Stavros Avramidis, Bruce McLean
- 190 Project No: 1994-06  
Title: Archeological overview of Alex Fraser Research Forest using GIS  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Damon Oriente
- 191 Project No: 1994-05  
Title: Whole tree harvesting and the Sustainability of Forest Ecosystem Productivity-Forcye calibration  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researchers: Hammish Kimmins, Xiaohua (Adam) Wei
- 192 Project No: 1994-04  
Title: Effects on vegetation of prescribed fire on Interior Douglas-fir - lodgepole pine forests

- Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Michael Feller, Claudia Hanel
- 193 Project No: 1994-03  
Title: Douglas-fir release in the IDF  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Karel Klinka, Harry Williams
- 194 Project No: 1994-02  
Title: NIVMA installation - Fd/Pl planting  
density trial in the SBS  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 195 Project No: 1994-01  
Title: Weevil attacked spruce stem analysis  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Rene Alfaro, Leo Rankin
- 196 Project No: 1993-15  
Title: NIVMA installations -- vegetation  
response to clump vs mixed bag planting regimes  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 197 Project No: 1993-14  
Title: Planting microsite selection and  
conifer seedling performance  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Phil Burton
- 198 Project No: 1993-13  
Title: Shade tolerance of Douglas-fir and  
lodgepole pine in the IDF zone  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A
- Researchers: Gordon Kayahara, Karel Klinka
- 199 Project No: 1993-12  
Title: Silviculture systems windfirmness  
pilot study  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Steve Mitchell
- 200 Project No: 1993-11  
Title: Effects of rapid on-site thawing  
of planting stock on seedling quality and  
establishment success  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Rob Guy, Salim Silim
- 201 Project No: 1993-10  
Title: Integrated management of forest  
mammal pests: Mustelid semiochemicals and  
diversionary foods  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Maria Leung, Don Reid, Tom  
Sullivan
- 202 Project No: 1993-09  
Title: Biological control of Armillaria  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Bill Chapman, Guoping Xiao
- 203 Project No: 1993-08  
Title: Vegetation inventory system for BC  
-- Pilot Study  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: John Johnson, Verne Sundstrom
- 204 Project No: 1993-07  
Title: Large scale photography digital frame  
cameras for forest inventory  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest
-

- Start date: N/A  
Researchers: Dave Clark, Xiaoping Yuan
- 205 Project No: 1993-06  
Title: Tree tubes: Comparison of several types for vole damage  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 206 Project No: 1993-05  
Title: NIVMA installation - Tredegar brush blankets field trials  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 207 Project No: 1993-04  
Title: Aquamend polymer field trials  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Jack MacDonald
- 208 Project No: 1993-03  
Title: Planting prescriptions to reduce spruce weevil damage  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Cathy Koot
- 209 Project No: 1993-02  
Title: Armillaria and juvenile spacing in IDF  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Bart van der Kamp
- 210 Project No: 1993-01  
Title: Development of stand goals for small group selection management systems on mule deer winter range  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A
- 211 Project No: 1992-12  
Title: Global positioning system field testing  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Rudi Durfeld
- 212 Project No: 1992-11  
Title: Art in the forest  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Rick Gibson
- 213 Project No: 1992-10  
Title: Palatability to mule deer of Douglas-fir seedlings from different latitudes  
Forests: Alex Fraser - Gavin Lake, Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Dawn Vernon
- 214 Project No: 1992-09  
Title: Calibration of "Prognosis" for IDF forests  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Catherine Bealle-Statland
- 215 Project No: 1992-08  
Title: Birch interplanting with Douglas-fir  
Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Ken Day
- 216 Project No: 1992-07  
Title: Biodiversity in interior Douglas-fir zone  
Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researcher: Rick Dawson
- 217 Project No: 1992-06
-

Title: Uneven-aged interior Douglas-fir stand development and factors influencing tree and stand growth

Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researchers: Mike Bonnor, Paul Boudewyn

218 Project No: 1992-05

Title: Acid rain monitoring plots

Forest: Alex Fraser Research Forest

Start date: N/A

Researcher: Cathy Koot

219 Project No: 1992-04

Title: Seedbed ecology in shelterwood sites

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researcher: Phil Burton

220 Project No: 1992-03

Title: Arbortech brush blankets for control of competing vegetation in conifer plantations

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Bev Atkins, Ken Day, Claire Trethewey

221 Project No: 1992-02

Title: Biodiversity in lodgepole pine managed stands

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Pontus Lindgren, Tom Sullivan

222 Project No: 1992-01

Title: Wildlife diversity in shelterwoods

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Dagmar Keisker, Herb Langin

223 Project No: 1991-10

Title: Knife Creek Growth and Yield Permanent Sample Plots

Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researcher: Sam Davis

224 Project No: 1991-09

Title: Diversity of small mammals in the IDFb2: Preliminary survey on mule deer winter range at the Knife Creek block.

Forests: Alex Fraser - Knife Creek, Alex Fraser Research Forest

Start date: N/A

Researcher: Harold Armleder

225 Project No: 1991-08

Title: Survival, growth and yield of three native hardwoods, lodgepole pine and interior spruce on five sites in the Cariboo Forest Region

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researcher: Nola Daintith

226 Project No: 1991-07

Title: Biotechnology and lodgepole pine

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Linda Abraham, Colette Breuil

227 Project No: 1991-06

Title: Ecological effects of slashburning

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researcher: M.C. Feller

228 Project No: 1991-05

Title: Rhizobacterial inoculation of conifer seedlings with 5 different strains

Forests: Alex Fraser - Gavin Lake, Alex Fraser Research Forest

Start date: N/A

Researchers: Chris Chanway, Greg O'Neill

229 Project No: 1991-04

Title: Relationship of small mammal populations to uniform even-aged shelterwood systems

- Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Thomas Friese, Tom Sullivan,  
Charlotte Von Trebra
- 230 Project No: 1991-03  
Title: Control of spruce weevil damage in  
spruce plantations by introduction of alternate  
commercial species  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, John McLean
- 231 Project No: 1991-02  
Title: Assessment of bacterial strains for  
effectiveness in promoting the growth of conifer  
seedlings on a forest site.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Paige Axelrood, Reed Radley
- 232 Project No: 1991-01  
Title: Integration of timber and mule deer  
management on the Gavin Lake Block: A case  
study in integrated management planning  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Ken Day
- 233 Project No: 1990-14  
Title: Effects of cold storage on physiology  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Al Balisky, Phil Burton
- 234 Project No: 1990-13  
Title: Douglas-fir beetle mortality and  
foliage colour change.  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Alana Murray
- 235 Project No: 1990-12
- Title: Forest land disposal of sewage solids  
(sludge) for forest fertilization.  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Hamish Kimmins
- 236 Project No: 1990-11  
Title: Ecophysiological assessment of  
embryogenesis-derived seedlings (emblings) vs  
seedlings.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Steve Grossnickle, John Major
- 237 Project No: 1990-10  
Title: Bt for control of *Pissodes strobi*  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Aileen Wardle
- 238 Project No: 1990-09  
Title: Treatment response of lodgepole pine  
to juvenile spacing when infested with Dwarf  
Mistletoe.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Bart van der Kamp
- 239 Project No: 1990-08  
Title: Spruce terminal leader clipping for  
*Pissodes strobi* control.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: John Harris
- 240 Project No: 1990-07  
Title: Gypsy moth trapping  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Owen Croy
- 241 Project No: 1990-06  
Title: Operational perspectives on  
management of Douglas-fir bark beetles and mule  
deer winter range in the Cariboo.
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Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Ken Day

242 Project No: 1990-05  
Title: Lethal trap logs for Douglas-fir bark  
beetle.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Leo Rankin, Von Vickers

243 Project No: 1990-04  
Title: Douglas-fir beetle: Management with  
trap logs and the anti-aggregation pheromone  
MCH  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, Staffan Lindgren

244 Project No: 1990-03  
Title: Volume loss due to *Armillari ostoyae*  
in the Moffat Supply Block  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Don Doidge

245 Project No: 1990-02  
Title: Cariboo fisher transplant study  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Alton Harstad, Darryl Hebert

246 Project No: 1990-01  
Title: Application of the PlanTS yield  
simulator to the UBC/Alex Fraser Research  
Forest  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: Ken Day, Jordy Tanz

247 Project No: 1989-10  
Title: An unusual case of winter bud damage  
in B.C. Interior conifers

Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: John Worrall, Bart van der Kamp

248 Project No: 1989-09  
Title: Risk/hazard rating for Mountain Pine  
beetle, and a link to GIS.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
- Knife Creek, Alex Fraser Research Forest  
Start date: N/A  
Researchers: John Kwa, Jerry Maedel, John  
McLean, Peter Murtha

249 Project No: 1989-08  
Title: Mule deer pellet group transects in the  
Knife Creek winter range.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Herb Langin

250 Project No: 1989-07  
Title: Productivity of interior spruce in the  
SBSdw subzones.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Karel Klinka

251 Project No: 1989-06  
Title: *Armillaria* in the Alex Fraser Research  
Forest  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Bart van der Kamp

252 Project No: 1989-05  
Title: Juvenile spacing lodgepole pine by  
girdling (demonstration)  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Ken Day

253 Project No: 1989-04  
Title: Spacing regimes for maintenance of  
habitat diversity

- Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: 21.7.1989  
Researcher: Harold Armleder
- 254 Project No: 1989-03  
Title: Alternative silviculture systems for the SBSk subzone  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: 1.6.1989  
Researchers: Chris Burger, Ken Day, Craig Sutherland
- 255 Project No: 1989-02  
Title: Comparative efficiency of Lindgren funnel traps and traditional trap for Douglas-fir beetle census at Beaver Valley  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Ken Day
- 256 Project No: 1989-01  
Title: Overwinter survival of Douglas-fir bark beetle at Knife Creek.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Ken Day, Leo Rankin
- 257 Project No: 1988-92  
Title: Effect of frontalinal on trap trees for Douglas-fir beetles.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A
- 258 Project No: 1988-13  
Title: Lodgepole pine provenance trial  
Forest: Alex Fraser Research Forest  
Start date: N/A  
Researcher: Oscar Sziklai
- 259 Project No: 1988-12  
Title: Spruce weevil surveys in the Cariboo Forest Region.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest
- Start date: N/A  
Researcher: Kornelia Lewis
- 260 Project No: 1988-11  
Title: Spacing regimes to develop mule deer winter range habitat  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Harold Armleder, Ken Day, Peter Marshall
- 261 Project No: 1988-10  
Title: Christmas tree culture for School District 27  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: Lloyd Csizmadia, Ken Day
- 262 Project No: 1988-09  
Title: Lethal trapping systems for Douglas-fir bark beetle.  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: John McLean
- 263 Project No: 1988-08  
Title: Growth and yield plots located in the Gavin Lake block  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest  
Start date: N/A  
Researcher: Sam Davis
- 264 Project No: 1988-07  
Title: Colour IR photography of Douglas-fir bark beetle infestations  
Forests: Alex Fraser - Knife Creek, Alex Fraser  
Research Forest  
Start date: N/A  
Researchers: N. Krajci, Peter Murtha
- 265 Project No: 1988-06  
Title: Plantation of Douglas-fir seedlings on a frost prone site in the ICHe2.  
Forests: Alex Fraser - Gavin Lake, Alex Fraser  
Research Forest
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