The Foothills Model Forest
Adaptive Forest Management/ History Program
Report # 7

50 Years of Harvest and Reforestation
A Historical Photo Review of
The Hinton Forest Management Agreement Area

by:
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1983

2006

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Acknowledgements

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Images for this publication came from West Fraser's extensive photo collection at Hinton, as well as images from the Alberta Forest Protection History Collection that has been assembled by Robert Stevenson and Peter Murphy. Others came from archival material of the Zimmer Report that Steve Ferdinand discovered and preserved. 2006 ground images were taken by the author, aerial images were mostly taken by Hinton photographer Brian Carnell with some supplementary ones by the author.

I am grateful to staff members from Hinton Wood Products who offered timely support and encouragement. Jim LeLacheur and Aaron Jones suggested the project to me as a unique opportunity to combine my interest in forest history with my hobby of geocaching. Diane Renaud was very helpful in assembling the silviculture record, and Byron Vriend lent great support in the production of maps and photopoints for the project. I have greatly enjoyed working on this project while reflecting on the many interesting issues, events and people that have shaped the exemplary forest management program at Hinton. And revisiting many of the plantations and projects that I personally worked on has been personally enriching.

Bob Udell, November, 2006

Disclaimer

The views and statements expressed in this report are those of the author, and should not be construed as statements or conclusions of, or as expressing the opinions of the Foothills Model Forest or its partners or sponsors.

Abstract

The report is a pictorial and historical record through time of harvest areas on West Fraser's Hinton Forest Management Area (FMA). Drawing upon his own records as well as the archival records of West Fraser and others collected through the Foothills Model Forest Adaptive Forest Management and History Program, the author selected 36 blocks from the 1950s to the 1990s for rephotography.

A continuing pictorial record is thus established, along with a discussion of significant and interesting events associated with the times as well as represented by the blocks themselves.

Most of the blocks, with the exception of some aerial and landscape images, were visited on the ground and photopoints established with GPS coordinates recorded for future retrospectives.

Introduction to Report

The report is organized by decade, each decade preceded by an introduction which sets the ensuing photo essay into a historical context. This introduction is then followed by the blocks chosen from that decade, organized by Working Circle and individual block numbers. There are five Working Circles (Athabasca, Marlboro, Embarras, McLeod, Berland) on the FMA, each of which was once a separate management unit for allowable annual cut calculation. Today the cut is calculated based on the two Forests (Crossley and Loomis) south and north of the Athabasca River respectively.

Each Working Circle is divided into operating compartments and each compartment is then subdivided into blocks for harvest and reforestation. For each block in this report, a short silvicultural history is given, followed by a series of pictures taken at various times since harvest. These vary depending on when someone happened to take the original image after harvest. The 2006 photo series includes ground images from GPS - referenced ground locations (Photopoints) as well as aerial images to put the block into context with the surrounding landscape. Finally, a short photo essay on landscape convergence wraps up the report.

WEST FRASER HISTORICAL PHOTOGRAPHY AND ARCHIVE PROJECT

Introduction

In July 2005, the Forest Resource Improvement Association of Alberta approved a project to relocate and rephotograph a series of harvest areas representing the history of forest management on West Fraser's Hinton FMA since operations began in 1955. Bob Udell, the Company's retired Manager of Forest Policy and Government Affairs, had been present and involved in much of this history and was asked to develop and carry out the poject. Work began in the fall of 2005, and was completed by September 2006 with the publication of the report and the photo archive, a permanent record that can be revisited in future years to continue the record.

Background

The Hinton Forest Management Area (FMA), now owned by West Fraser Mills Ltd is Alberta's oldest FMA, and pioneered the development of large-scale industrial forest management in Alberta. In so doing, the company developed a forest management program that is acclaimed across Canada and internationally. This recognition has come in many forms, for example Donald McKay devoted a chapter of his book "Heritage Lost: The Crisis in Canada's Forests" (MacMillan of Canada, 1985) to describing this program as a bright light in an otherwise gloomy picture across the country. Many awards and citations over the years have reinforced the continuing legacy first established through the vision of the Company's first Chief Forester, Des Crossley, and carried on by his successors.

The operation has not been free of controversy. The records from one such campaign (see Related Reports) that took place in the early 1970s have provided a number of pictures of operations at that time. Some of these locations are revisited in this report, more will be reported in a parallel study underway at Foothills Model Forest. Despite the Company's continuing commitment to adaptive forest management and its effort to incorporate the most up-to-date science in its practices, controversy and ENGO campaigns continue.

This report provides compelling visual evidence that past practices have sustained a healthy and vibrant forest on the landscape. Company studies have shown the all species known to be present at the beginning of forest operations in 1956 continue to enjoy the habitat necessities to survive and thrive. Most are doing so, with the exception of Woodland Caribou, and this species has been in decline along the Eastern Slopes since before large scale forest management operations began in Alberta, and the decline is also seen in Jasper National Park, a large protected area which has not had such forestry operations.

Over the years, many photographs have been taken of the harvested areas in various stages of development but examples of such images immediately following harvest through reforestation and growth over time are sadly deficient. In this photo and archive project we have located a number of such images on the Hinton FMA, revisited and rephotographed them on the ground and from the air. Where possible, we attempted to rephotograph from the same perspective as the original photograph, but prolific growth and the passage of time precluded this in most cases. Indeed, it was very challenging to locate the boundaries between blocks in many cases, as healthy young stands separated by relatively few years are taking on similar characteristics. Instead, points were chosen that had good potential for future relocation and rephotography. Also, the GPS coordinates of the prime ground photopoints were recorded for the continuance of the record in future years.

As the project advanced, it became evident that many of these blocks had linkages to interesting events in the history of forestry at Hinton and these are included in this report also.

Related Reports and Projects

In 1915, Dominion Land Surveyor M.P. Bridgland conducted a photographic survey of Jasper National Park. His images have survived, and in 1998 a Master's student at U of A – Jeannine Rhemtula – relocated all of Bridglands Jasper photopoints. She then took new pictures of the same landscapes using a similar format camera. This remarkable collection, showing landscape and vegetative change over 70 years, has been widely used by researchers and communicators alike. It is a highly valuable collection for the national park system, but because it was Jasper - focused it has little coverage of the adjacent foothills where large scale commercial forestry operations have been underway for 50 years.

In 1971, Arnim Zimmer, representing the environmental advocacy group Save Tomorrow, Oppose Pollution (STOP) visited the FMA and took a series of negative images of fresh cutovers and alleged environmental degradation. His highly publicized 1972 report and the negative publicity it generated caused great consternation within the ranks of the Company and the Alberta Forest Service. The assertions turned out to be unfounded, but such controversy continues. The Zimmer photo series was rephotographed in 1987 by Jack Wright and in 1997 by Bob Stevenson and Steve Ferdinand. The blocks were also ecologically classified by a Company silviculture crew under forester Lyn Bergeron. A new report of the Ferdinand/Stevenson study is also being prepared.

Methodology

The photo collections of West Fraser, Bob Udell, Jim Clark (retired Woodlands Manager), Jack Wright (retired Chief Forester), Ken Armson (retired Chief Forest of Ontario), and the Alberta Forestry Collection (Zimmer files) were searched for images of the early stages of harvest and reforestation during the 1960s, 70s and 80s. Some more recent images from the 90s were also included to add early perspectives to an ongoing legacy. Photos with locations noted were of particular value. The author was able to identify some sites not identified on the archived photos, but unfortunately, many excellent photos had to be rejected because their locations were unknown and could not be determined. The archive is assembled by Working Circle. There are five Working Circles on the FMA, each was at one time treated as a separate sustained yield management unit.

Photos chosen for the project were scanned at high resolution, and paper copies produced for field reference. These, along with orthophoto-based maps from West Fraser's GIS group were used to locate the blocks on the ground. Where possible - which was seldom- the sites were visited and rephotographed from ground positions that appear to be as close to the original photopoints as possible. In most cases, vegetative growth in intervening years obliterated the original photopoints, so new points were chosen that should be easier to relocate in future. Latitude and longitude for each permanent photopoint were recorded using a Garmin GPSmap 60CS GPS unit and images were taken at high resolution using an Olympus E300 digital SLR camera. Aerial photography of these blocks was ground-referenced using features readily relocated. Where possible, similar reference points are shown by arrows in this report.

Finally, some general landscape images were identified and rephotographed to illustrate landscape change and stand "conversion" over time.

The historical context for this report was drawn from a number of reports in Foothills Model Forest's Adaptive Forest Management/History Series, as well as historic timelines used in the development of those reports. Jack Wright and Steve Ferdinand also provided some insights from their own experiences and Jack kindly lent his copy of the Silviculture Records for the purpose of preparing this report.

Blocks of the 1950s

Historical Context

Before the 1950s, all logging operations were by permit or timber berths, normally a sawlog "diameter limit" cut with timber dues paid to the provincial government and no requirements for reforestation or ongoing stewardship. The government assumed reforestation and management planning liability but with extremely limited budgets neither was done, generally. A better way was needed and the Province's Director of Forestry Eric Huestis, set out to design it. First, he developed an Order in Council that declared the Green Area in 1948, rationalizing the areas available for settlement and those to be retained for forestry. In 1949, he hired Reg Loomis to develop a forest inventory for the Province and also developed the new *Forests Act* for Alberta (29 March 1949) that included a new clause authorizing Agreements with industry for ***growing continuously and perpetually successive crops of forest products.***

Entrepreneur Frank Ruben, incorporated (23 May, 1951) North Western Pulp and Power Ltd. and signed such an Agreement with the Province, the genesis of what was to become the first successful Forest Management Agreement in Alberta. He found a joint venture partner in the St. Regis Paper Company and in 1954 the Company started working on developing its new pulpmill in Edson. This effort was disrupted when it became evident that water flow in the McLeod River was inadequate for the proposed mill, and in January 1955 the decision was made to move the site to Hinton, on the Athabasca River. Construction began in May 1955, and a new Pulpwood Lease Area (PLA) with a reserve for expansion was selected, centred around Hinton.

Forest Policy and Planning

Research scientist Des Crossley was recruited from the Canadian Forest Service in March 1955 to become the first Chief Forester for the Company. He was given freedom to design and implement a forest management program on the PLA with the proviso that the cost could not exceed 10% of the all other costs associated with harvest and delivery of wood to the millsite.

Chief Forester Desmond I. Crossley
Aerial Photo of Camp 1 Cuts in Background

Based on his work in pine and spruce silviculture, Crossley had many ideas on how a sustainable forestry program could be designed and implemented and welcomed the opportunity to put them into practice on this large forest estate. He immediately set out to hire a staff of experienced foresters and technicians to help him build his vision and legacy. Among them were Jack Wright, who would later replace Crossley as Chief Forester, and future Woodlands Manager Jim Clark.

Work began on establishing a system of permanent forest inventory plots, as well as a map showing the dates at which the thousands of forest stands on the PLA originated from fire. These became key pillars of the forest management program, and remain so today. In 1958, the preliminary forest management plan was submiited.

Ground Rules

Crossley and Loomis came from much different backgrounds, each with strong and sometimes opposing views on how this forestry program should be designed, but in a remarkable demonstration of collaboration they negotiated Alberta's first set of Operating Ground Rules, a three-page document dated 11 March 1958 which included this clause: "... the cutting system to be adopted ***on a trial basis*** will appropriately be some pattern of clear cutting. ***As many modifications of such cutting systems will be adopted as possible*** in order, ***by***

experiment, to arrive at a system or ***systems best adapted*** to the silvicultural requirements of the species in question, the topography and the operational requirements inherent in economical pulpwood extraction." This statement was an early definition of Adaptive Forest Management that predated its entry into the forestry lexicon by almost 20 years. In 1997, their legacy was recognized when the Hinton Forest was renamed in their honour.

Forest operations

Gordon McNabb, former manager of the Rhinelander/St. Regis operation in Hornepayne, Ontario was brought in as the first Woodlands Manager and set about to locate and inventory 300,000 cords of wood for the first year's operation. Camps 1&2 (McLeod 1) and Camp 5 (McLeod 9) were chosen for this purpose, and camp and road construction began. In 1957, McNabb was replaced by Adrien Provencher, who came to Hinton from a St. Regis affiliate in Hearst, Ontario.

***Camp 1**, Wildhorse Lake, 1957*

Most of the logging was to be done in winter from permanent, 20-year camps. established in operating compartments representing 500,000 cords of wood, to be cut at 25,000 cords/year. Most camps held 100 men. Labour was a challenge but winter operations could attract prairie farmers to supplement their income, thus bolstering the permanent workforce of Company employees.

(Right) ***Nick Tomkiw and His Prized Belgian Draft Horses**, 1957. Tomkiw was the original Camp 1 contractor, and the longest-serving (1956-68) horse logging contractor on the operation.*

Conventional logging at the time was with power saws - still sometimes with Swede or Crosscut saws - with horse skidding to landings where the 8-foor "ricks" of pulpwood would be piled to await hauling. Hauling was done with "bob tail" trucks carrying small loads of 8-foot pulp to the mill yard for stacking and storage.

A number of timber berths were still operating on the PLA at start-up and most of these were allowed to continue operations until the expiry of their 20-year licences, which were not then renewed. The last one ceased operation around 1968.

Operations were barely underway when three large forest fires on the Pulpwood Lease Area belied the assurance that this was an "asbestos forest". Following these fires, many changes were made to the Alberta Forest Service (AFS) protection organization, including a new Fire Protection Agreement with the Company that provided strong commitments on levels of protection and mutual responsibilities.

Silviculture methods

Based on his considerable experience, Crossley selected clear cutting as the appropriate silviculture system for the extensive even-aged stands on the PLA. In spruce stands, this was to be in narrow strips at right angles to the prevailing winds, and in pine stands he believed in large clearcut patches with regeneration to come from the seed in cones, released by the sun's heat to fall on prepared mineral soil. To this end Crossley's Forestry Department experimented with a number of different systems of site preparation before finally designing a three-toothed ripper blade - later named the "Crossley Plough" - to expose the mineral soil. This was mounted at the front of a D-9 Caterpiller, with large anchor chains following behind the Cat to scatter slash and cones on the receptive soil.

Crossley strongly believed in natural regeneration and was initially content to let nature take its course in providing it. Unfortunately, this did not always work and by the late 1950s it was apparent that some form of planting would be necessary on areas where natural seeding did not provide the 40% stocking deemed necessary for adequate regeneration.

"STOP" and the Zimmer Report

"This picture has been purposely chosen...since it very well represents the forest of the future in Alberta if we continue with present regulations under which the "pulp mill" is allowed to operate." STOP Report, 1972

During the late 1960's and early 1970's, the environmental group "Save Tomorrow Oppose Pollution" (STOP) were targeting forestry practices in Alberta, and chose the high profile forestry program at Hinton as their primary focus. In 1971 Arnim Zimmer, a member of this group, visited the operation and made a pictorial record of certain harvest areas from the period 1956 to 1970 that in his mind exemplified the problem. His subsequent 1972 photo essay and report to the Minister and the media (the "Zimmer Report") generated considerable adverse public and media attention on the operation, much to the consternation of Crossley who took great pride in the forest management program he created.

Neither was the Province's Department of Lands and Forests enthralled with the report and its negative focus on the Province's stewardship of the forest resource. In 1972 the Province's Director of Forestry, Fred McDougall, dispatched his Head of Silviculture Dr. Kore Hellum to relocate Zimmer's photopoints and examine his assertions. Hellum took great pains to relocate Zimmer's original photo sites, he also located and staked viable seedlings in the viewscape and calculated an average stocking level. Hellum's report not only refuted Zimmer's assertions of regeneration deficits, but also identified areas of overstocking in these so-called "wastelands" where he predicted that subsequent thinning would be required to maintain growth and yield. This subsequent report and the publicity it generated with its compelling evidence of effective reforestation and promise of a new forest effectively ended the STOP campaign.

In 1987 retired Chief Forester Jack Wright revisited these same areas and rephotographed them. These pictures unfortunately could not be found, so in 1997 retired foresters Steve Ferdinand and Bob Stevenson returned to the area and again relocated and rephotographed the blocks in Zimmer's report. Ferdinand, a former NWP&P forester who served under Crossley at the time of the Zimmer Report subsequently left the Company to himself become Head of Silviculture for the Province. While there, he obtained a copy of the Zimmer Report and original copies of both Zimmer's and Hellum's photographs. The 1997 investigations will be detailed in a separate report, with supplementary material from this one.

Some of the "Zimmer" blocks were chosen for inclusion in this report, along with a 2006 photography update that will be used in the parallel study.

Blocks of the 1950s—The Zimmer Report

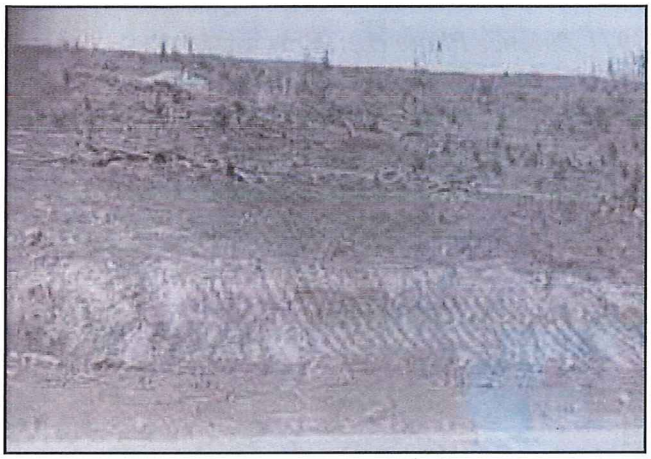
Berland 8, Block 26
Cut 1956
Left for Natural Regeneration

1971 Zimmer Photo (L): This image was a strip road in block 28, a fact which Zimmer chose to overlook, claiming it as an example of early methods of scarification and noted *"you will probably agree with me that there is hardly a blade of grass which grows between those wind rows"* .

1972 Hellum Photo (R): Hellum pointed out that the roadbuilding practice of stripping mineral soil without subsubsequent reclamation had long since been abandoned. Despite this, he placed a white stake wherever he found a seedling and noted that the general area was fully stocked at an average 856 trees/acre with an average height of 12 inches.

The Picture in 2006 (Below). At Photopoint 1 (R), the author stands on an old unreclaimed strip road similar to and in the same general area as the Zimmer picture. Block 26 is to the right of the old Lower Road, the photopoint is near the pipeline intersect. This healthy, fast-growing (Site Index 18) lodgepole pine stand is fully stocked and merchantable by today's standards.

Berland 8, Block 28
Harvested 1959
Scarified for Natural 1960
Seeded by hand 1962
Planted pine (Spenser-Lemaire Seedlings) 8 ha. 1976,1979

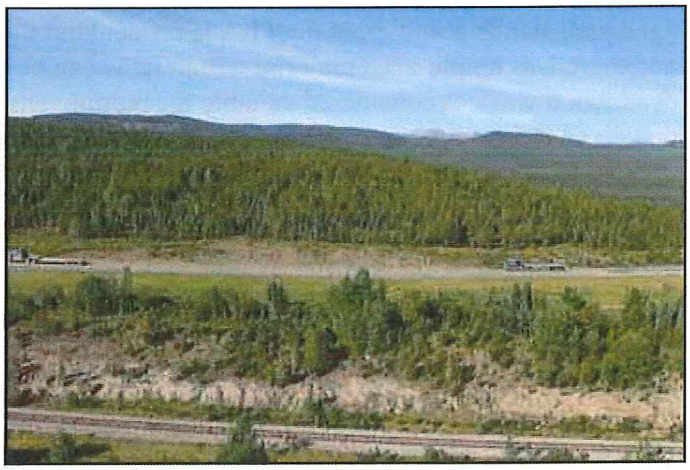


1971 Zimmer Photo (L): Zimmer described a mixture of fir and pine advanced growth, at an average *"ten by eighty feet apart"*. The foreground of the picture shows right of way stripping associated with the recently-constructed Grande Cache Highway (Hwy 40 North)

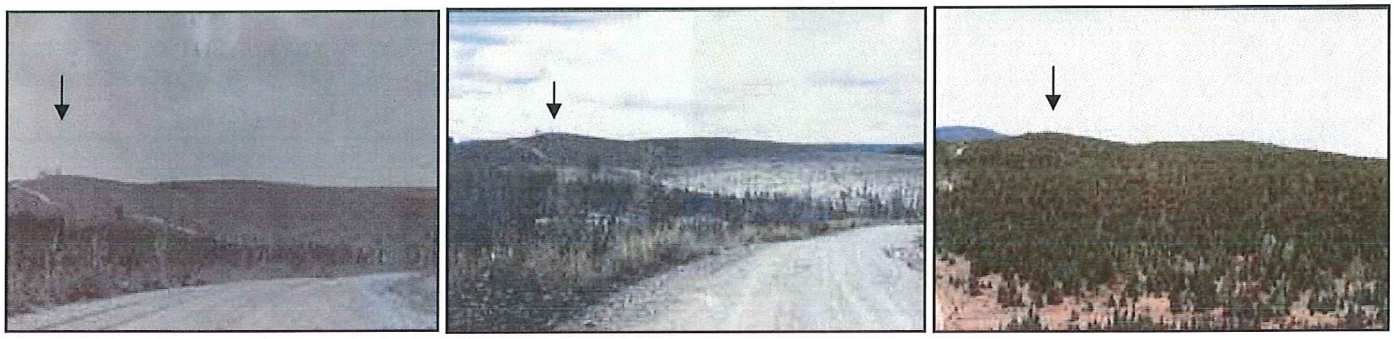
1972 Hellum Image (R): *"This photo shows that there are abundant conifer seedlings in this area, in fact there were on the average 670 seedlings per acre of spruce and pine. Even if one only counted the advanced growth on the plots there would be a tree every 10 X 20 feet not 10 X80 as claimed by Mr. Zimmer."* Hellum, 1972

2006 Perspective (L): This image, from Photopoint 2 shows a well developed and thriving stand of pine, spruce and fir along Hwy 40 north.

(Left) ***Photopoint 2, Block 28 - 2006:*** Interior of the 45 year old regenerated stand, Site Index 17.5.

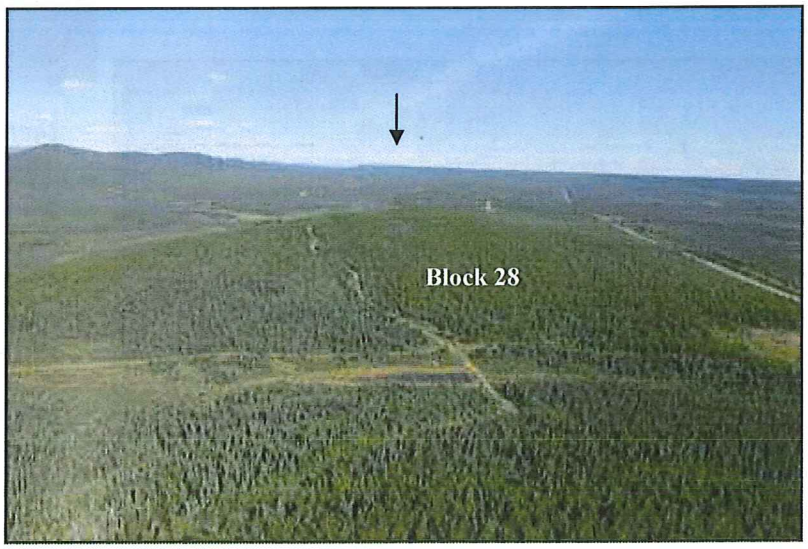


(Right) ***Aerial View, 2006.*** Traffic along Hwy 40 provides a perspective on stand development in Block 28 alongside and west of the Highway.



Zimmer/ Hellum/ Ferdinand & Stevenson Images (L-M-R): Zimmer's 1971 report—"*What we see here is a complete denuded area almost bald from horizon to horizon...* The *area here shows very little reforestation evident* " was contradicted by Hellum: *"There is an abundance of pine and spruce regeneration all over this hill, but it is not made visible by photography from over a mile away".*

(Right) ***Aerial View of Block 28 from the South, 2006***
Zimmer's *"denuded area"* fills the centre of the picture with a carpet of green trees.

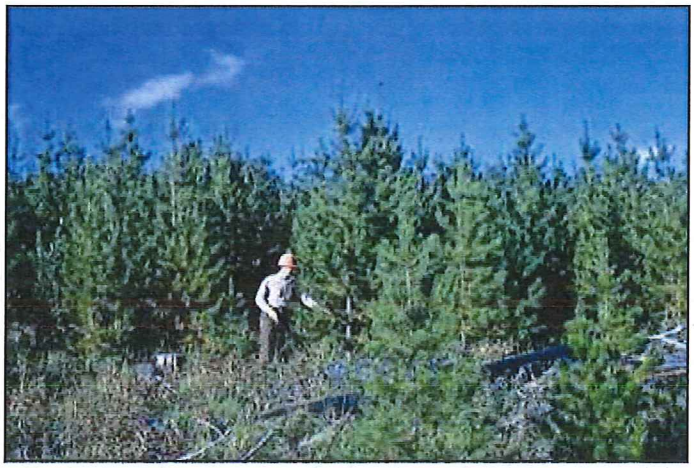


Blocks of the 1950s - Images and Discussion

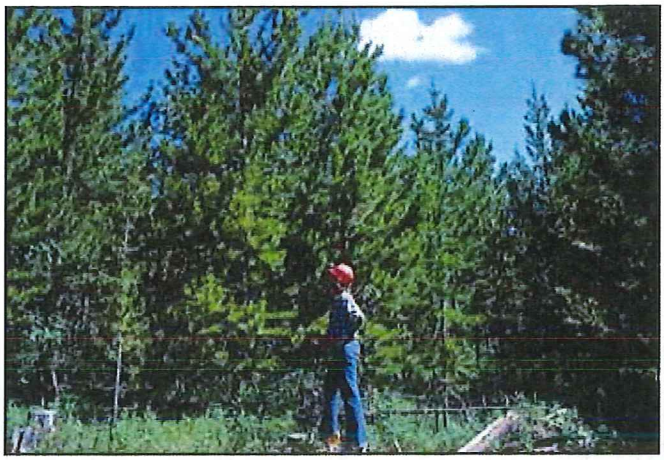
McLeod 9, Block 28 - Large Pine Cuts
Cut 1956 - 270 Ha
Scarified for Natural 1957
Aerial Seeding 1962
Parts Planted 1965, 1967
Crossley's conviction that clear cuts - and the larger the better - were the best prescription for the largely even-aged pine stands dominating the PLA is reflected in this very large cut just south of Hinton. The stand was old, and there was ample dead material within it, as can be seen from pictures taken during the harvest. At the time, dead wood was not considered suitable for pulping and was normally left standing or knocked down if it was perceived to be a hazard to workers. Scarification completed the job, and it was necessary to use very large tractors to break up this material and expose sufficient mineral soil/scatter sufficient cone-bearing slash for natural regeneration to take place.

(Left) ***Block 28 Harvest Area, 1956.***
Note 8 foot pulpwood "ricks" in block, as well as standing dead trees. Today's Workers Compensation Board regulations would not allow this amount of dead material to be left standing while loggers with powersaws were working in the block, for safety reasons.

(Right) ***Block 28 ca 1966***
Forester Russ Powell (l) and
Silviculture Manager Bob Carman (r)
examine pine regeneration in Block 28



(Left) ***Block 28, 1973***
This famous picture of Jack Wright in Block 28 appeared on the cover of the report "Environmental Effects of Timber Harvesting Operations in the Edson and Grande Prairie Forests in Alberta" by C.D. Schultz & Company (the "Schulco Report") - a commissioned report for the Minister of Lands and Forests which concluded that timber operations were environmentally appropriate for the area.



(Left) ***Block 28, 1981***
Technologist Larry Matwie examines the thrifty pine stands in Block 28.

(Right) ***Block 28, Photopoint 1, 2006***
Unless the traveler left the road and entered the stand, there is little visual evidence that this stand is anything but a "natural" forest—and indeed it now provides the ecological services that a natural forest of a somewhat more advanced age would do.

Block 28, Photopoint 1, 2006
50 years following harvest, a merchantable and still growing stand fully occupies the hillside.

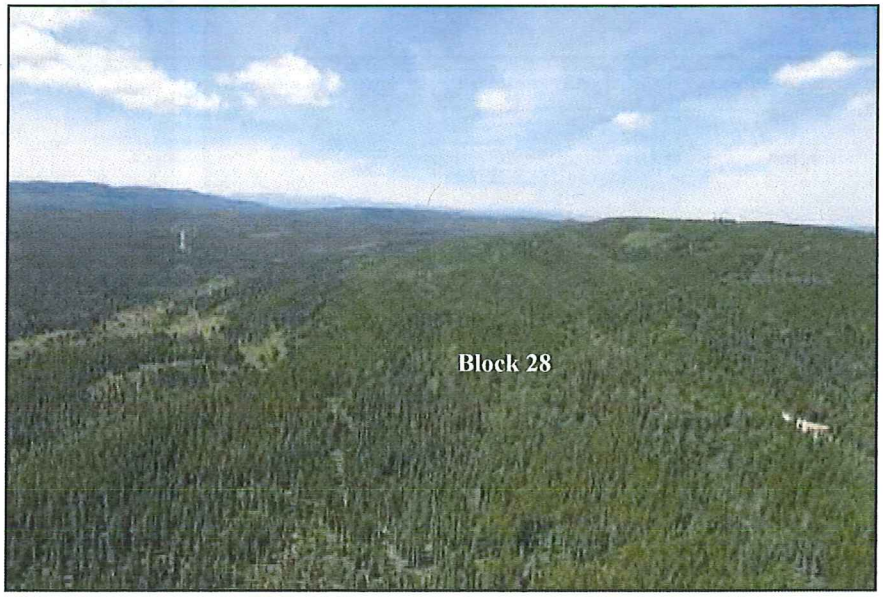
Block 28, Photopoint 1, 2006
The author is dwarfed by the 18m trees on the site.

(Left) ***Block 28, Photopoint 2 (L) 2006***
View of the hillside from the access road crossing Quigley Creek.

(Right) Block 28 - Aerial view 2006 - same perspective as the image above, looking NE

(Left) Block 28, Aerial View 1981
Crown closure is not complete, pine, aspen and alder have have completely occupied the old strip roads running parallel to the contour lines

(Right) Block 28 Aerial View to the West, 2006
Looking towards Hinton, 2006
Crown closure on the Block 28 hillside above Quigley Creek is virtually complete



Marlboro 7, Block 2 - High Impact Juvenile Spacing
Cut 1958
Scarified for Natural 1959
Mechanical Thinning/ Juvenile Spacing 1977

The Company began juvenile spacing in the 1970s, initially to reduce overdense stocking in fire origin stands, but later to accelerate stand development and set the stage for subesquent commercial thinning in regenerated pine stands.

Surveys of this block in the early 70s showed it to be overstocked with pine regen by the standards of the time. A juvenile spacing program was underway, and the Company was looking for ways to increase its efficiency and cost. This block was chosen to test the use of mechanical thinning.

(Left) Kershaw Clearway Thinning Operation, 1977

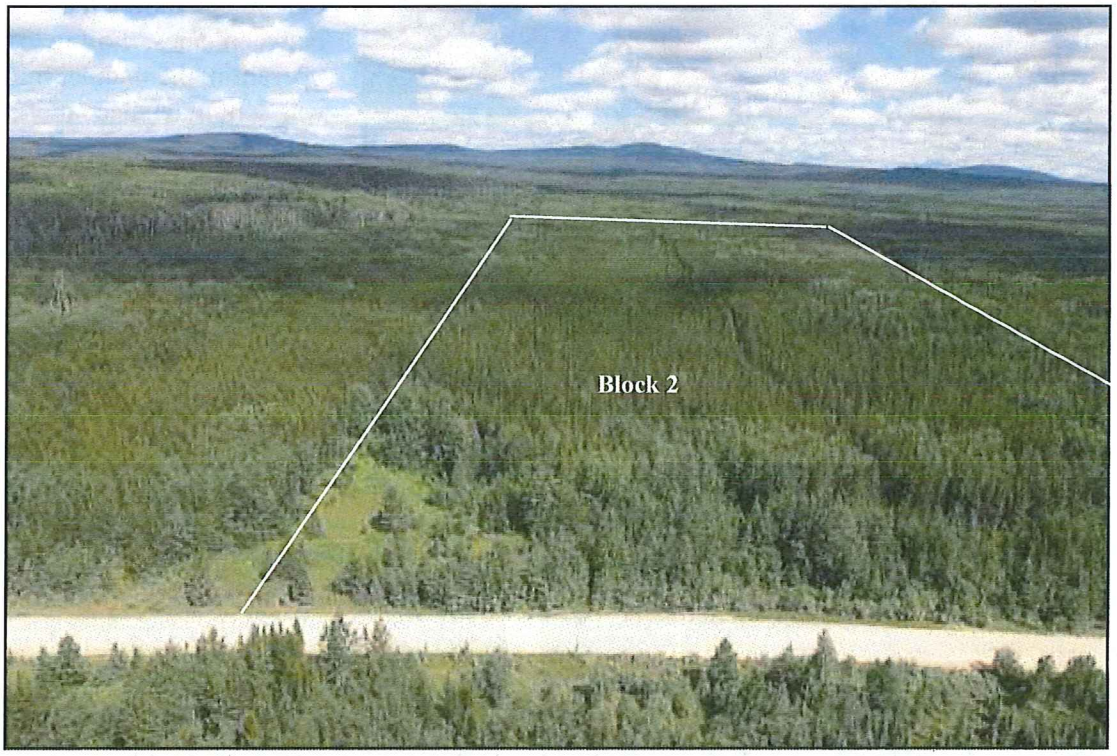
A Kershaw Clearway thinning machine - seen here - mounted on a crawler tractor was used to clear lanes, each about 3m wide, through the 5-6m high pine regeneration, leaving about 2 m between lanes. Following this operation, the manual thinning crew was sent in to space the trees in the untreated rows between lanes.

(Below) Aerial View after Spacing - 1977 (left) and 2006 (right)
The corridors left by the Kershaw Klearway can be clearly seen in the 1977 image. In 2006—21 years later, the corridors have largely faded from view, and a mixed pine/ aspen stand occupies the site.

(Left) Marlboro 7 - Block 2, 1985

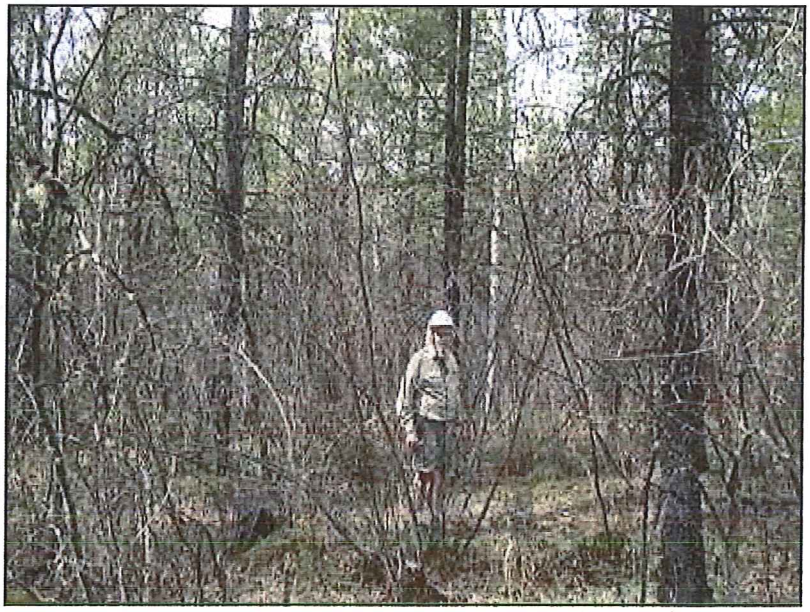
In the years following the mechanical thinning, this block was a frequent stop on Company tours such as that of the 1985 Canadian Pulp and Paper Association's Forest Management Committee, seen here. Slash from the hand thinning between rows can still be seen on the Kershaw cleared rows.

Research by the BC Ministry of Forests leading to the development of the Tree and Stand Simulator model (TASS) in the 1980s began to call into question the value of juvenile spacing programs - particularly at the stocking levels normally found in pine stands originating following harvest and reforestation, and especially where those stands were growing on rich sites. Block 2 is one such site, and looking back from the 2006 perspective the results largely support the BCMOF conclusions from the 1980s. The heavy handed spacing was a useful experiment but it was never repeated - nor should it be. Although the trees that survived are now merchantable, full site occupancy by pine is incomplete.



Aerial View of Block 2, looking North 2006
The Emerson Creek Road is in the foreground
Block 2 is north of the road. The line shows the block boundary

(Left) Block 2: Photopoint 1, 2006
A pleasing young forest of pine and aspen



(Right) Block 2: Photopoint 2, 2006
Some loss of full site occupancy has occurred following mechanical/ hand thinning

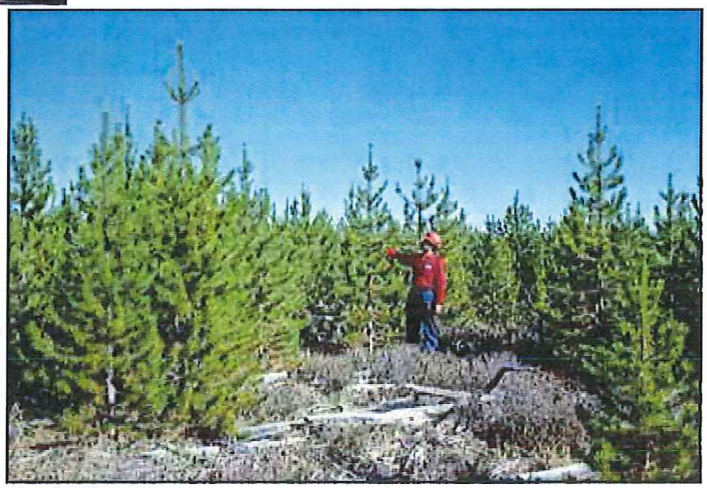
(Right) Wellsite near SE Corner of Block 2
Parts of Blocks 2 and Block 3 to the East were taken out by the construction of this wellsite and pumping station. The road forms the boundary between the blocks. Photopoint 1 is in the SW corner of the wellsite, Photopoint 2 just off the NW corner.

Berland 3, Block 15
Cut 1959
Scarified for Natural 1961
Juvenile Spacing 1981

(Left) Block 15, early 1970s

Pine blocks in the Berland Working Circle traditionally have been slow to establish following harvest and scarification, perhaps because of the advanced age of the stands at time of harvest. But natural regeneration is relatively easy to achieve in this pine-dominated Working Circle.

(Right) Block 15, 1977
Jack Wright examines the healthy, fast-growing pine in the 18-year old cutblock.



(Left) Photopoint 1, 2006

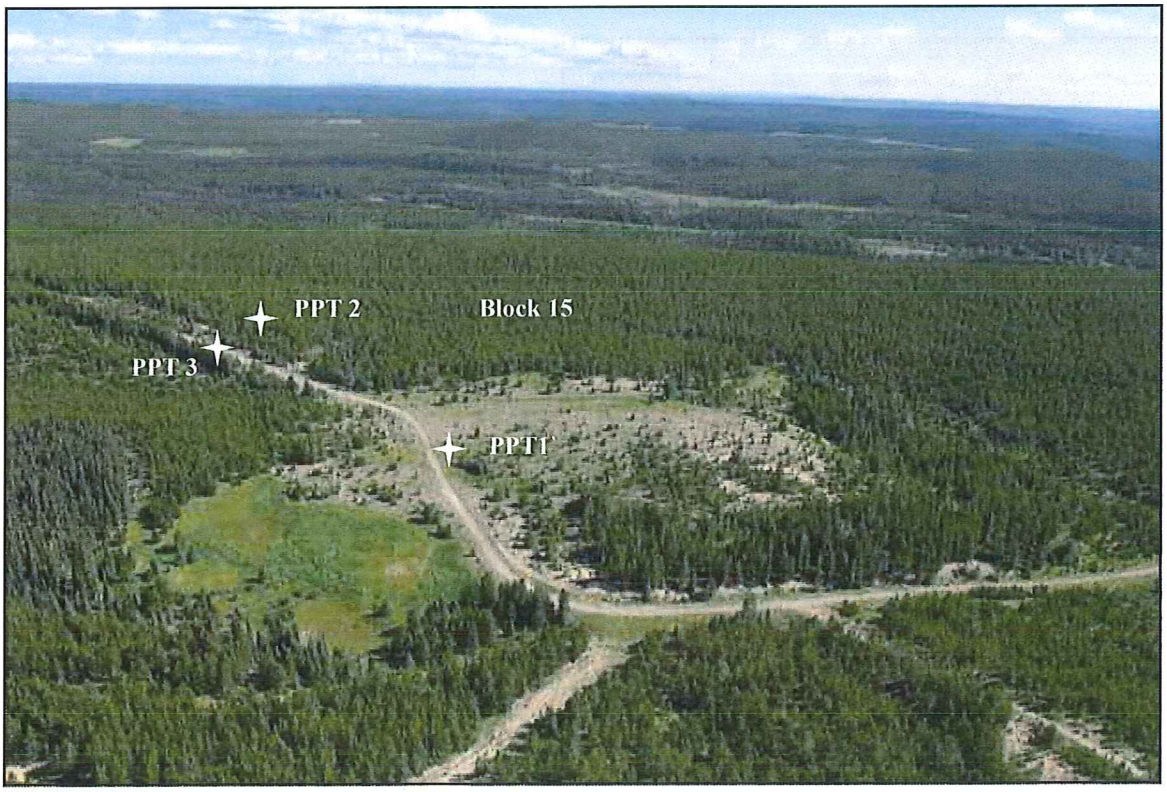
Standing on the original Camp 23 site, the young forest established on Block 15 is seen to the right of the road entering the campsite.

(Left) Photopoint 2, 2006 - Stand Interior

Trees are well established and growing in this pleasant forest stand.

(Right) Photopoint 3 (R), 2006
Along the access road, adjacent to stand interior photopoint.

(Below) Aerial View, 2006
The old camp 23 site sits on the bench below Block 15. The passage of time has largely obscured the boundaries between first and second pass blocks on the landscape. Stars indicate photopoints



Blocks of the 1960s

Historical Context

Many significant events took place in the 1960s. New Forest Management Agreements were announced in Grande Prairie (Canadian Forest Products 1964, Procter & Gamble 1969); the Quota System was developed in Alberta in 1966 - a management partnership whereby the Crown undertakes forest management planning and inventory, while the quota holder accepts other costs of harvest planning, development and reforestation; a major expansion including an expanded pulpmill and sawmill was announced at Hinton along with a new expanded FMA (1968).

The Hinton FMA saw strong oil and gas industry development, along with a revitalized coal industry causing growing concern in Crossley's mind about the integrity of the forest. This led to a major confrontation about the Company's rights regarding the trees and lands of the FMA, and it culminated in legal action.

In 1967, Premier E.C. Manning visited Hinton operations and presented the Company with a Certificate of Merit for its "outstanding contribution to the development, progress and prosperity" of the Province.

Forest Policy and Planning

In 1961, management forester Jack Wright completed the first detailed forest management plan for the FMA. The establishment and measurement of 3,000 permanent sample plots was also completed and used as the management inventory. In 1966, Wright revised the plan, setting the stage for the pending FMA expansion.

Crossley encouraged many of his former Canadian Forest Service colleagues to establish a number of research trials on the FMA examining a wide spectrum of the ingredients necessary for a successful and sustainable forest management program. This remarkable partnership between industry and the CFS continued for many years in Alberta. He also installed operational trials of his own and encouraged his staff to do the same. Nor was research limited to one external agency, and one such research trial that stepped well "outside the box" is featured in this report (p 34).

Some of Crossley's Forestry Team:
McLeod River Campsite ca 1962
L-R back row: Steve Ferdinand, Bill Hanington, Ray Ranger, Jack Wright, Des Crossley;
L-R front row: Eric Marrison, Phil Appleby, Hank Somers

Ground Rules

In 1967 the Ground Rules were revised and expanded to six pages including new rules on erosion control, stream crossings and streambed protection during road construction.

Forest Operations

Continuing challenges with finding 450 loggers and horses for Woodlands Operations led to experiments with various types of mechanized harvest and skidding. In 1964, trials using tree length logging and skidding to roadside with a Garrat Tree Farmer showed much promise and forest engineer Owen Bradwell was charged with expanding these trials in 1965, culminating in a large purchase of 55 Timberjack skidders in 1967, and the complete phase-out of horse logging by decade's end.

(Left) Garrat Tree Farmer Trial
Camp 22, 1964

At the close of the 1960s, workers no longer lived in camps, but commuted daily from town to the worksite. This meant a large-scale program of all weather access road development. The 8 foot wood program ended and operations were 100% treelength. Heavy trucks moved the wood to the millsite, where a new "slasher deck" bucked it to length before sending it to the woodroom for debarking and chipping.

Also in the late 60s, major weather problems combined with lack of progress in road development led to a number of "emergency cuts" where the Department allowed the Company to remove second pass cuts well before they would otherwise be scheduled. Some results of this decision will also be discussed in this report.

Silviculture

Scarification for natural regeneration continued as the first line of silviculture treatments, but the need for and level of planting continued to rise. Crossley was not satisfied with the quality of bare root stock provided by the Alberta Provincial Tree Nursery at Oliver and cast about for alternatives. This led to the hire of Bob Carman (1964), an Ontario forester with considerable expertise in containerized seedling production. Carman built the first Forestry Greenhouse in Hinton, producing containerized seedlings in "Ontario Tubes", which replaced bare root stock in the planting program. Carman introduced other innovations in silviculture, most notably the Management Opportunity Survey (MOS) - a formal post-harvest survey characterizing and mapping the harvested area with a silviculture prescription. This would remain as the key silviculture planning tool until supplemented with the Preharvest Prescription in the 1990s.

Regeneration surveys were introduced, along with minimum stocking standards and a requirement that all cutovers be stocked to acceptable species by 10 years after harvest. Second pass cutblocks could not be removed until this restocking was successful.

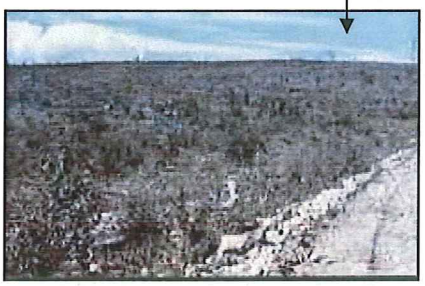
Crossley's strategy for natural reforestation of spruce through alternate strip cuts at right angles to the prevailing winds was paying off at Camp 1, as the first pass blocks were generally well stocked. Some challenges with grass competition and growth rates were observed, leading to some fertilization trials also featured in this report.

Increasing concern over the slow growth of heavily stocked pine stands following the large fires of the 1950s led to the establishment of a number of spacing trials and other experiments aimed at reducing this stocking to promote better pine growth. Many of these trials were established in the Gregg Burn, including a series of 1963 CFS trials that are today maintained by the Foothills Growth and Yield Association (FGYA). The FGYA is a cooperative of nine Alberta forest companies whose FMAs have a high component of lodgepole pine and they have pooled their resources to conduct research in the growth and yield of pine in Alberta.

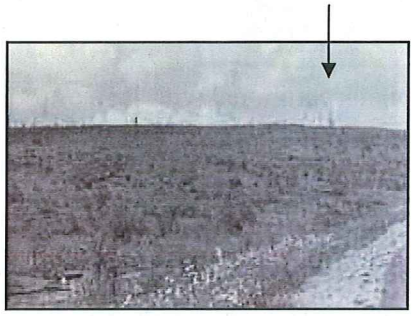
Blocks of the 1960s—The Zimmer Report
Most of the blocks visited by Arnim Zimmer were cut during the 1960s, and some of them will be revisited in this report.

McLeod 6, Block 139
Cut 1961
Scarified for Natural, 1961
Juvenile Spacing 1979

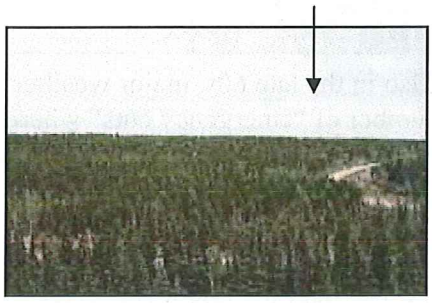
Zimmer's 1971 comment on this block - *" we can see how sparse coniferous tree life is in this area, which I described earlier as being bald from horizon to horizon"* - decried the lack of conifer regeneration, although the new growth is quite evident even in his own photo of the block (centre, below) Hellum rephotographed the block (left, below—1972) and summarized his own investigation: *"According to our survey, the foreground contains the average 815 lodgepole pine seedlings per acre. This constitutes overstocking by our standards in that any area with more than 600 seedlings per acre three years or older will encounter crowding problems before the trees reach maturity."* The Ferdinand/Stevenson aerial view at right shows the same bend in the road and a well stocked mid-rotation stand, site index 17.



(Above) Hellum, 1972



(Above) Zimmer, 1971

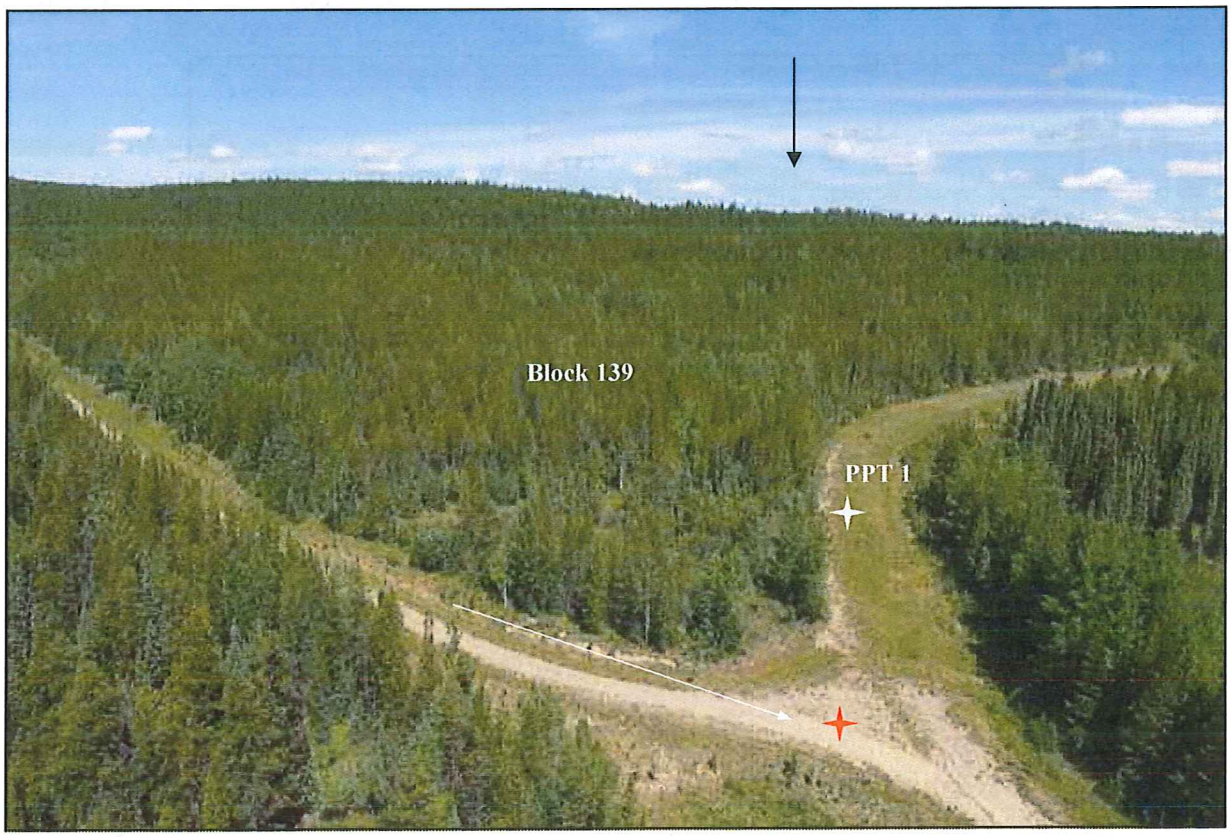


(Above) Ferdinand, 1997

(Above) View west along Yellowhead Trail
The access road leading along the south side of the block overlies the old Yellowhead Trail and was part of the 1980 St. Regis Marathon ski trail from Hinton to Robb.

(Above) Photopoint 1: 2006
The Pembina River road has been realigned and this part of the road, seen in the original Zimmer image curving away to the right, has been reclaimed.

(Below) Block 139 looking north. The aerial view of this block in 2006 shows the access road to the west (old Yellowhead Trail) which forms the southern boundary of the block, and the abandoned/reclaimed section of the PR road curving north and east. Boundaries between blocks are indistinguishable. White star indicates photopoint, red star is camera location in ski image at bottom, white line shows skiers' route.



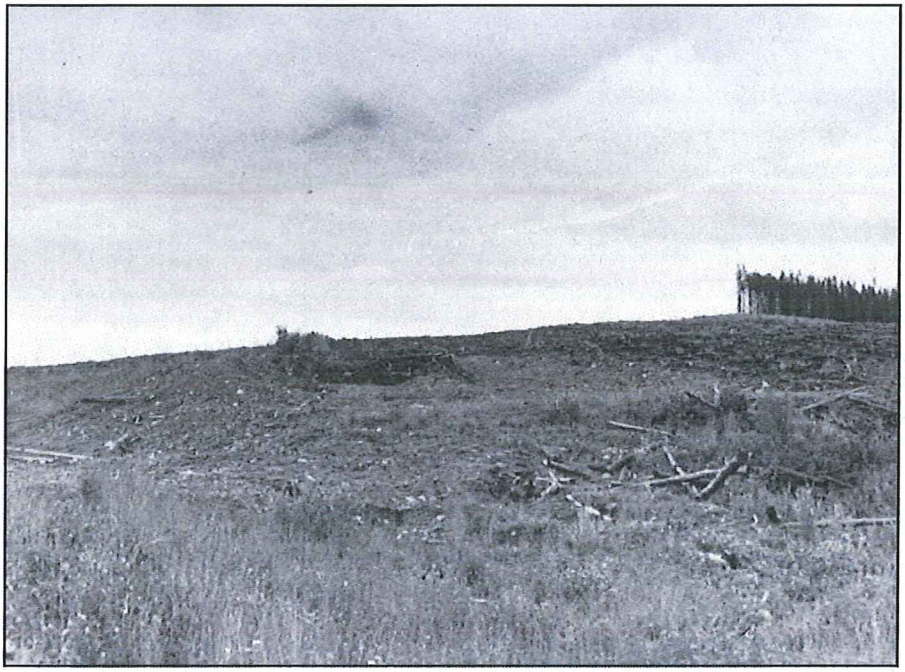
(Left) St. Regis Marathon, 1980

A competitor in the 1980 St. Regis Ski Marathon approaches the junction where the Yellowhead Trail (see line, image above) met the Camp 22 access road. This 60 km trail was used only once, then replaced with a loop circuit at Camp 29.

McLeod 6, Block 211
Harvested 1966
Scarified for Natural 1967

Again, Zimmer's discussion around his photo (below, 1971) and Hellum's around his own (bottom, 1972) disagree. Zimmer: *"We still can not detect anything of significance as far as regeneration is concerned"*

(Right)
Block 211,
Zimmer 1971

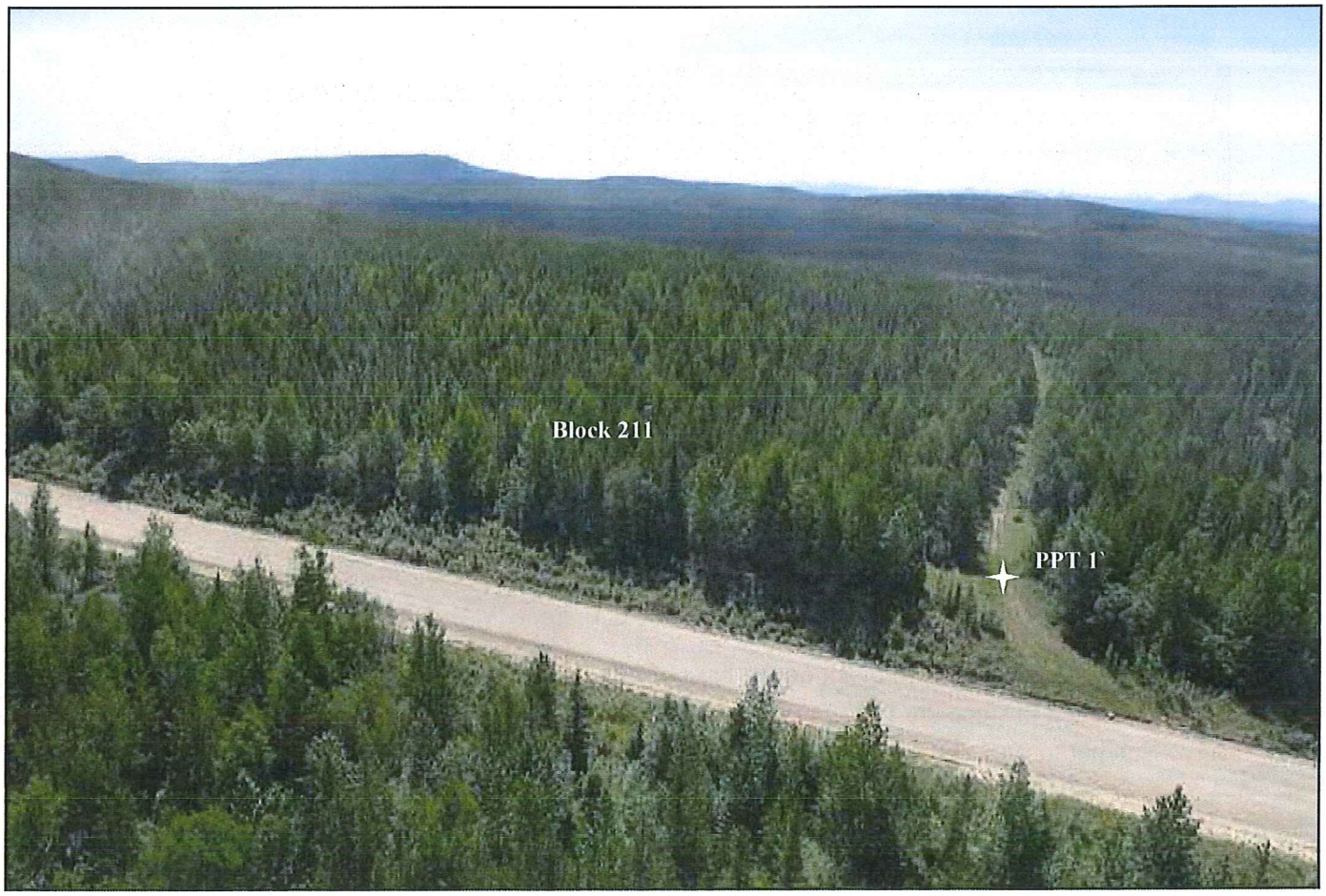


Hellum: *"Photo shows this area to have some considerable stocking to coniferous seedlings"*. Hellum's report described only 335 pine and spruce seedlings per acre, somewhat below acceptable stocking at the time. However, pine continues to infill for many years following harvest, and the area was 88% stocked at the first survey in 1973. Hellum's staked trees can be seen in the upper frame of the picture.

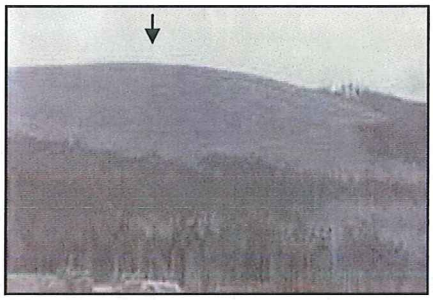
(Right)
Block 211,
Hellum 1972

(Right) Photopoint 1, Block 211: 2006
Just north of the Robb Road on an old access trail - See white star below.

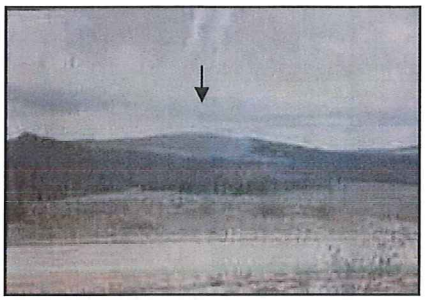
(Below) Aerial View, Block 211: 2006
Photopoint 1 (star) is just off the Robb Road in the clearing along the old road. A fast-growing stand of mixed pine, spruce and aspen fully occupies this rich site.



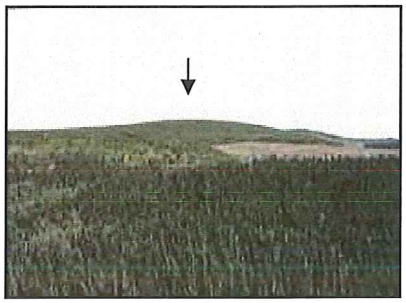
McLeod 6, Block 213
Harvested 1966
Scarified for Natural 1967



(Above) Zimmer, 1971



(Above) Hellum, 1972

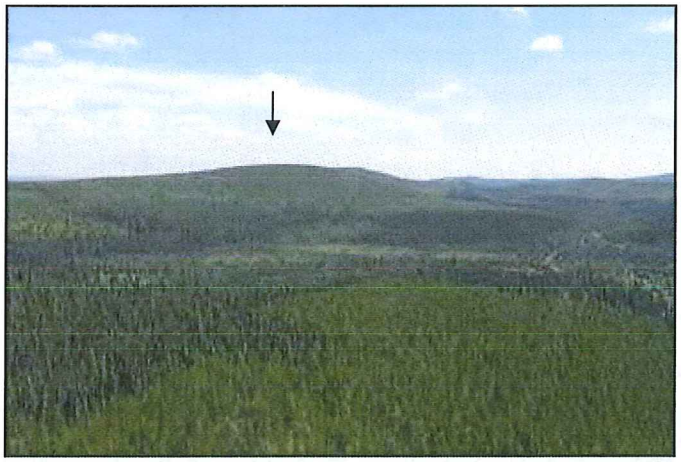


(Above) Ferdinand, 1972

Mr. Zimmer's telephoto lens captured this image (left, above) of block 213, far from where he stood and he commented *"but there is quite some erosion going on, on the top of the that hill".*

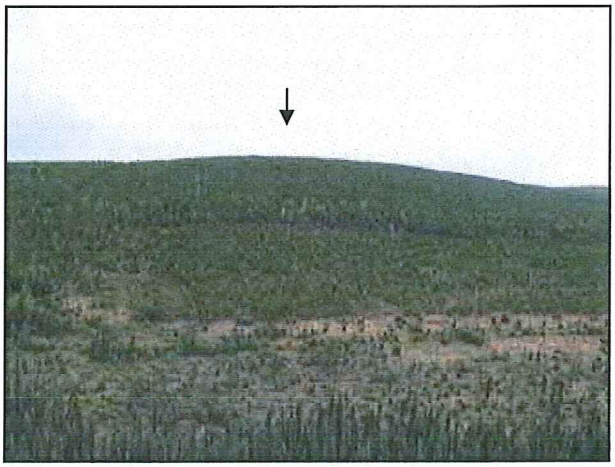
Hellum (above, middle) noted the risks associated with such judgement at such a distance, but opined that: *"the charge of "quite some erosion" is unlikely in view of what has been found to be the case everywhere else where Mr. Zimmer photographed scarification and regeneration"*

The Ferdinand/Stevenson image (above, right) from 1997 bears out Hellum's perspective on the issue, as do the 2006 images below.



(Left) Block 213 2006

View from across Block 210, same perspective as Hellum 1972 image (above middle).



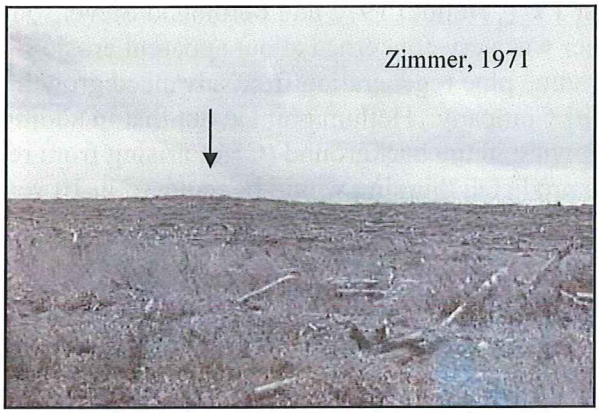
(Right) Closer view of Block 213, 2006

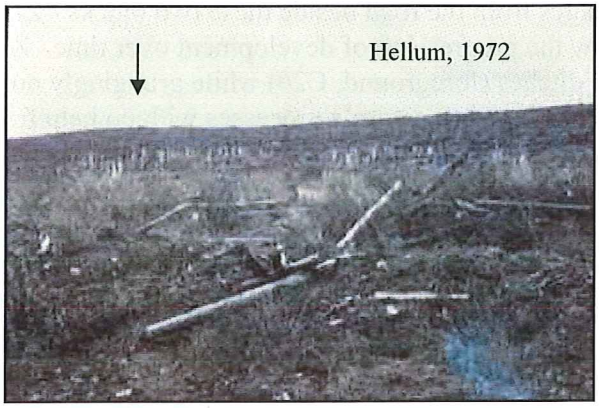
Note the pine regeneration in block 663 at base of hill which has filled in since the 1997 Ferdinand/ Stevenson photo (top, right).

McLeod 6, Block 532
Harvested 1969
Scarified for Natural 1969

This block, immediately adjacent to Block 211, was harvested only three years later, and scarified to promote natural regeneration. Clearly, it is one of the "emergency cuts" described in the introduction to this decade. Today, 37 years following harvest, it is virtually impossible to see a boundary characterized by tree size or stage of development between the two blocks and the only means to locate the block location was by careful study of the map and ground features (see image bottom left).

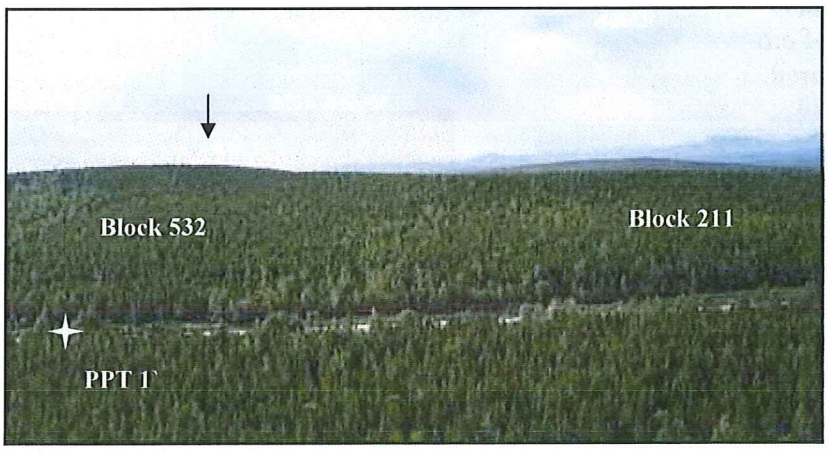
Zimmer chose Block 532 (below, left) as the last in his McLeod W.C. series, and his comment is telling: *"This picture has been purposely chosen as the last picture since it very well represents the forest of the future in Alberta if we continue with present regulations under which the "pulp mill" is allowed to operate. What we are looking at is an area bald from horizon to horizon, there is not very much forest environment left"*





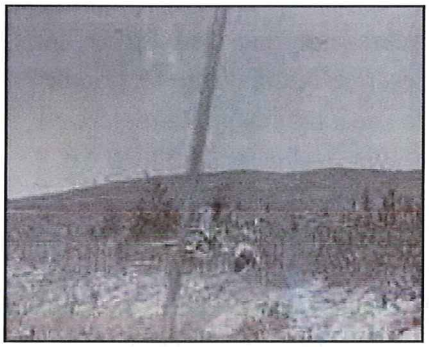
Hellum's 1972 picture (above, right) shows a sea of white stakes where he has found seedlings already established - in only three years - at a stocking level of 543 coniferous seedlings per acre, averaging 6 inches in height.

The 2006 aerial image (below, left) of Zimmer's *"area bald from horizon to horizon"* and ground view from Photopoint 1 on the Robb Road leave no doubt that a healthy stand has established on this site and is growing quite well towards Mr. Zimmer's *"forest of the future in Alberta"* but in a much more promising manner than he predicted.



Above: Photopoint 1, 2006

Berland 3, Block C14 & C20
Harvested 1966, 1970
Scarified for Natural 1966, 1971



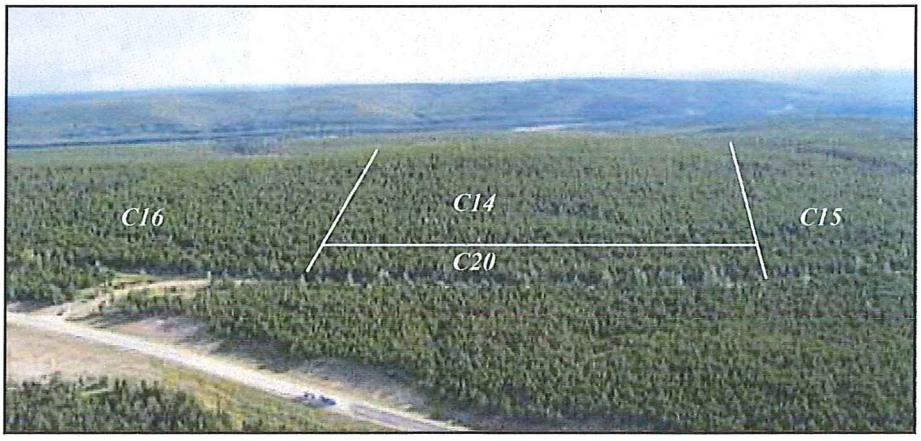
(Above) Zimmer, 1971

(Above) Hellum, 1972

(Above) Ferdinand, 1997

Three images from the road beside these two blocks - Zimmer 1971, Hellum 1972 and Ferdinand/Stevenson 1997 show the progression of development over time. Zimmer was very concerned about apparent erosion along the ditches (foreground, C20) while grudgingly noting some pine regeneration from advanced growth which he attributed to nature's processes with no help from the Company. Hellum pointed out that in addition to this advanced growth there were 1110 seedling per acre growing in the background (C14), arising from re-forestation efforts. They averaged 10 inches in height and he predicted thinning would be required in 10 years.

(Right) Aerial View, Blocks C14, C15, C16, C20: 2006
The 2006 image (right) shows a re-forested hillside where it is impossible to distinguish one block from the next. Lines show approximate divisions between block.



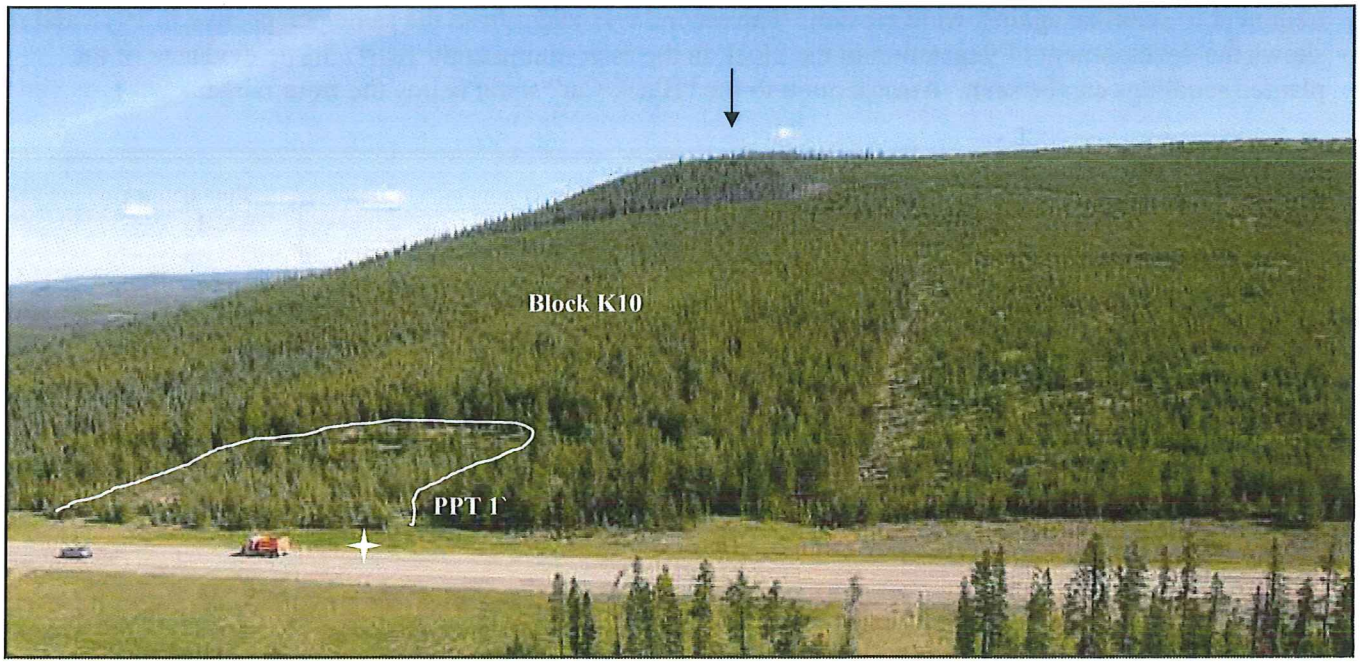
(Below) Photopoint 1, Block C20:
Along old Lower Road shows a healthy stand growing right up to the road. Any signs of erosion in the ditches has long since disappeared.

(Below) Photopoint 2, Block C20:
Stand interior.

Berland 4, Block K10
Harvested 1965
Scarified for Natural 1966
1976, 1980—3 ha planted ("borrow pit" reclamation)

(Left) Zimmer Image, Block K10: 1971
Zimmer decries that the area in the foreground has been *"completely stripped in that area of all plant life"* . Hellum noted that this observation was correct but went on to point out that it had been stripped for grade materials for the recently-constructed Grande Cache Highway. He noted that the hillside in the background contained 1360 seedlings per acre, all growing vigourously and probably would need thinning in 10 years.

(Right) Photopoint 1, 2006
The author stands beside Hwy 40 north in the reclaimed and replanted area that was stripped of vegetation and excavated for highway grade materials. This "borrow pit", as it is known, is also visible in the 2006 aerial view (below, outlined in white). An old trail separates block K10 from the more recent harvest on the right side of the aerial image below. The star shows the camera position for Photopoint 1.



More Blocks of the 1960s - Images and Discussion

Athabasca 5, Block 36 - Early Planting to Control Wind Erosion

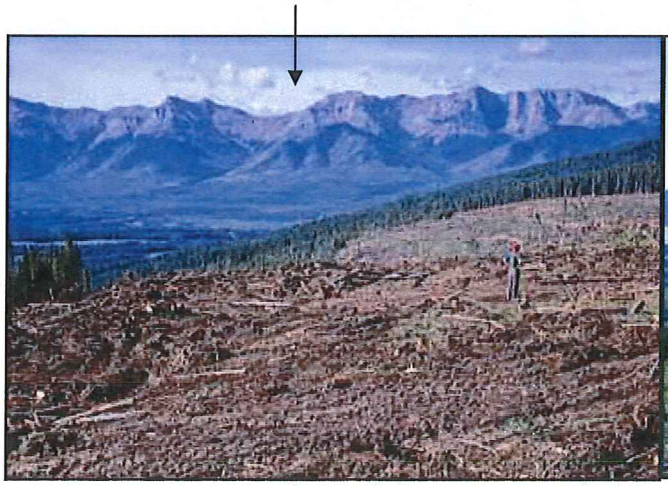
Cut 1966
Scarified 1967
Planted 1967,1968,1969

This high-profile and high elevation block sits near the top of a large hill on the south side of Solomon Mountain. It includes part of an area withdrawn from the FMA for the Brule Horse Pasture, when boundaries were redistributed with the 1988 expansion. The decision to immediately plant the area rather than await natural regeneration was linked to concerns around wind erosion, because immediate measures were taken following harvest to reclaim and stabilize roads and landings.

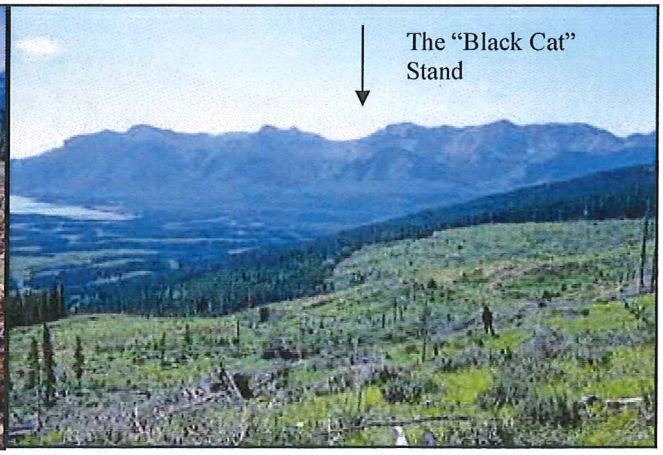
The block was planted using Ontario Tubes and it is likely that few of them survived to become part of the final crop, as experience with these containers has shown that they were not generally successful in dry, harsh environments. The author was in charge of the 1967 planting crew that planted the first section of the block.

(Left) Harvest Operations 1965
A photo taken by Jim Clark during harvest operations shows the heavy slash left following harvest, 8 foot pulpwood piled in the block. Note the standing dead and unmerchantable trees. Today, these would be left for stand structure services but in earlier days they were leveled by the scarification cats during site preparation activities. In the background the first pass cuts of "Camp 1" are evident.

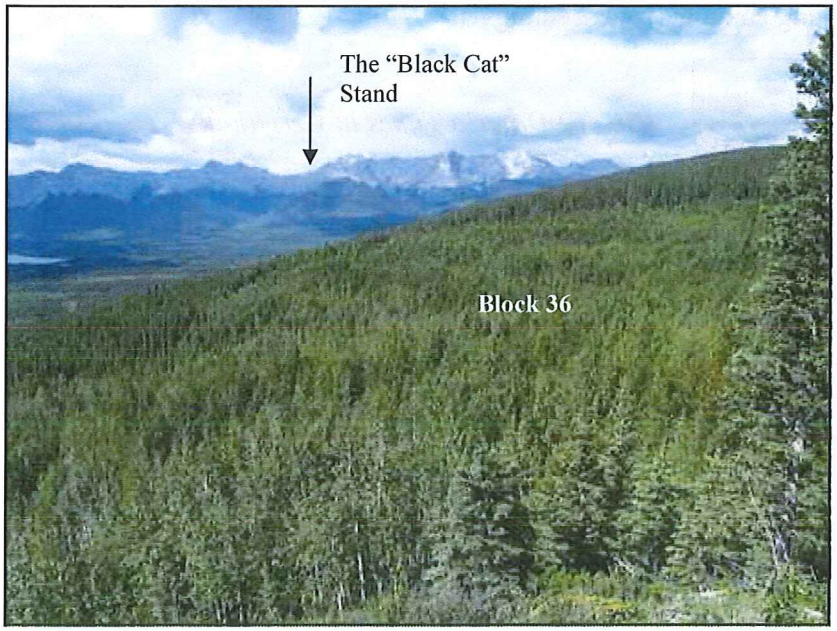
Below are two scenes taken in the block, the first in 1967 the year following harvest, site preparation and treatment to stabilize against wind erosion. The second was taken from the same perspective in 1975 and it shows the development of vegetation in the block in the intervening eight years. Little evidence of the planted seedlings can be seen. Arrows point to the "Black Cat" stand below the front range.



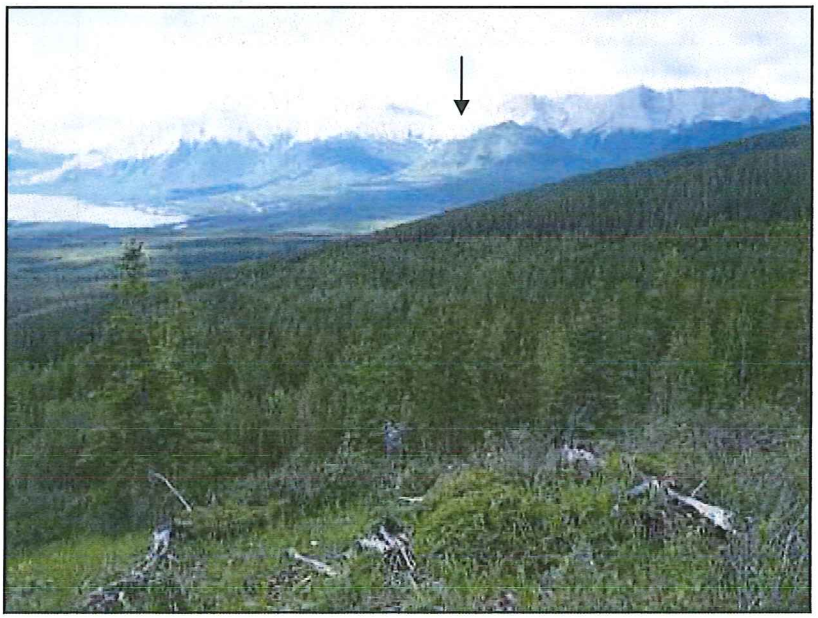
Block 36, 1967



Block 36, 1975



(Left) Block 36, Photopoint 1
This view from the first bench shows the mixed pine/aspen/spruce forest now growing on the block. The arrow continues to point to the "Black Cat" stand which is beginning to fade into the surrounding landscape.

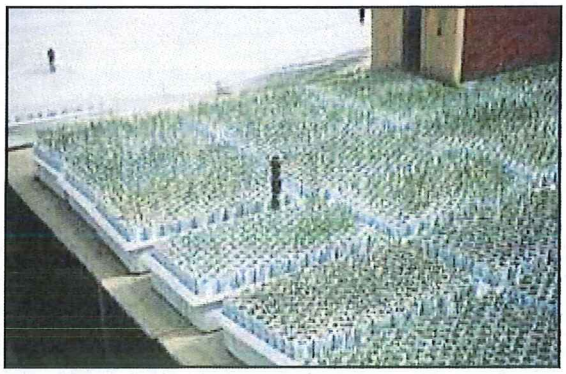


(Right) Block 36, Photopoint 2
Hunters have removed regeneration to maintain a clear view of the block below this ridge

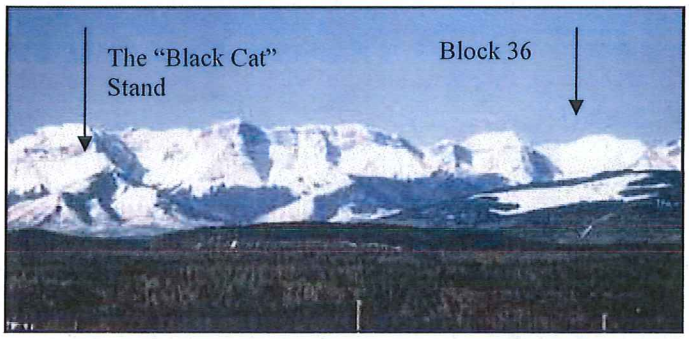
(Left) Photopoint 3
The author provides a early spring perspective on the size of the young growth in the block.

Tree planters (below) in Block 36 - planting containerized seedlings

(Below) Ontario Tubes in Greenhouse

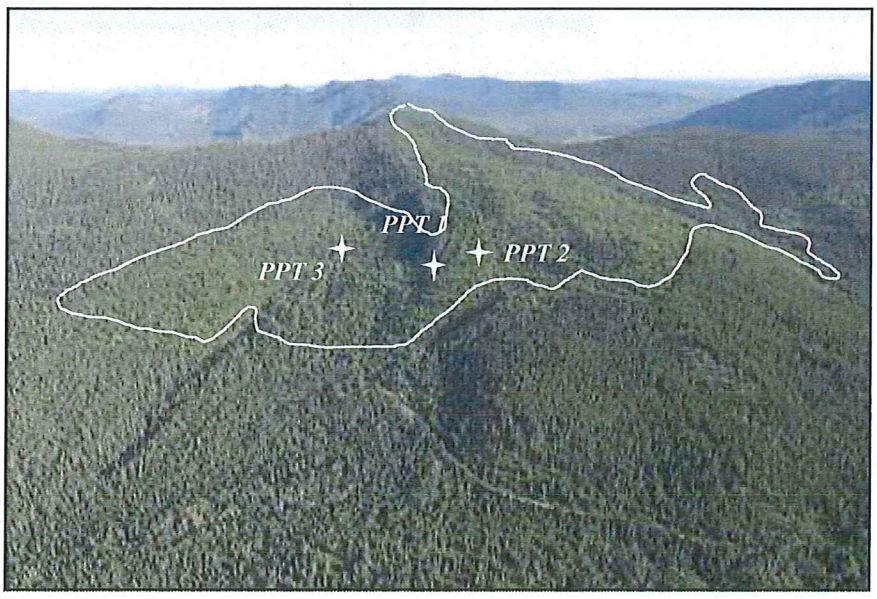


(Right) The first Forestry Greenhouse (1965-1981) -now part of the woodyard

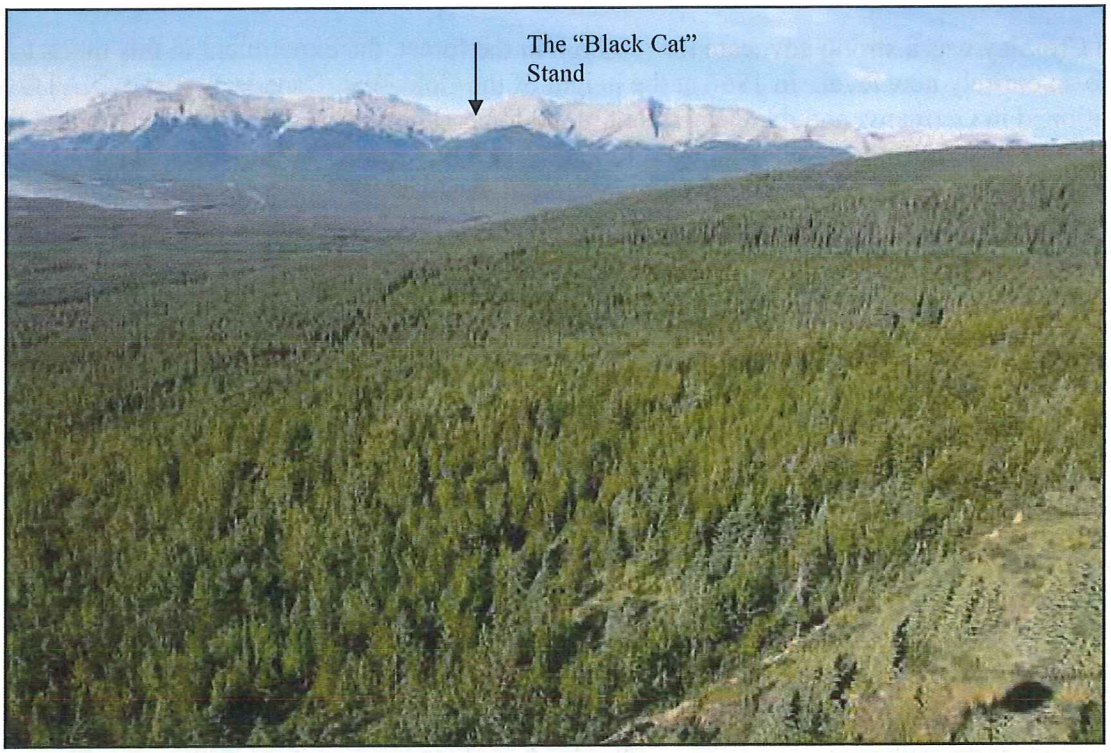


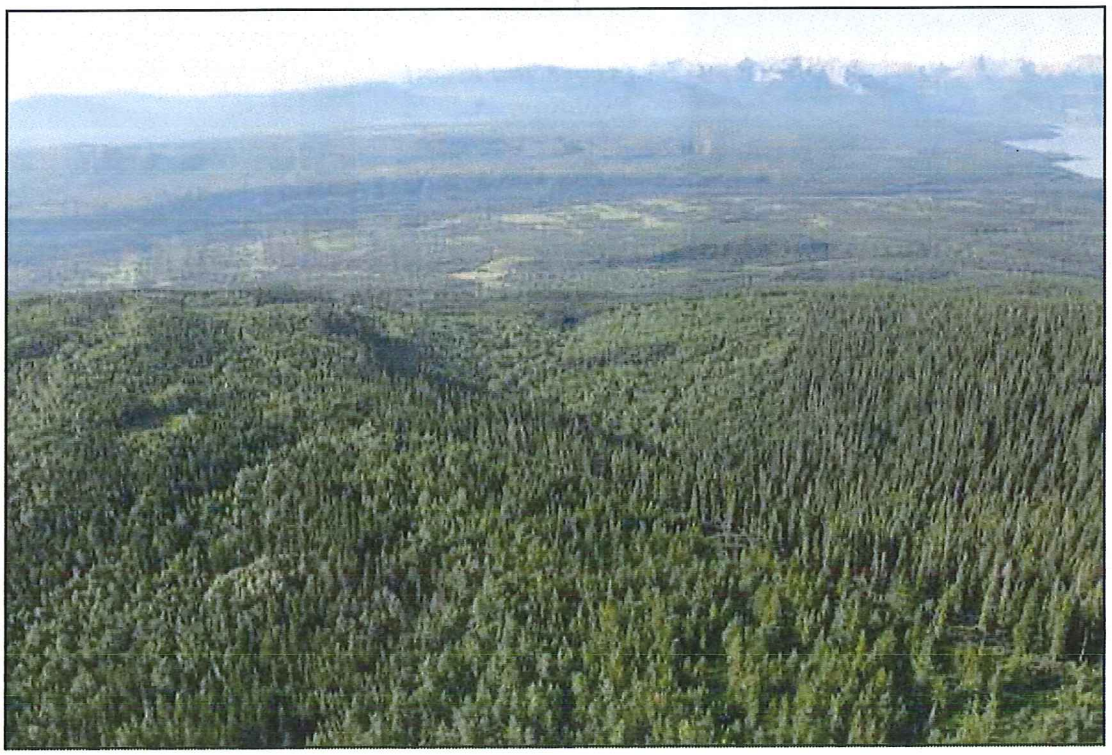
The outline of the block is clear on the 1972 photo (left) while today (below) in a view looking north the young growing stand is softening the visual impact. Approximate photopoint locations are marked with stars, approximate boundary in white.

(Right) Block 36 Looking North, 2006



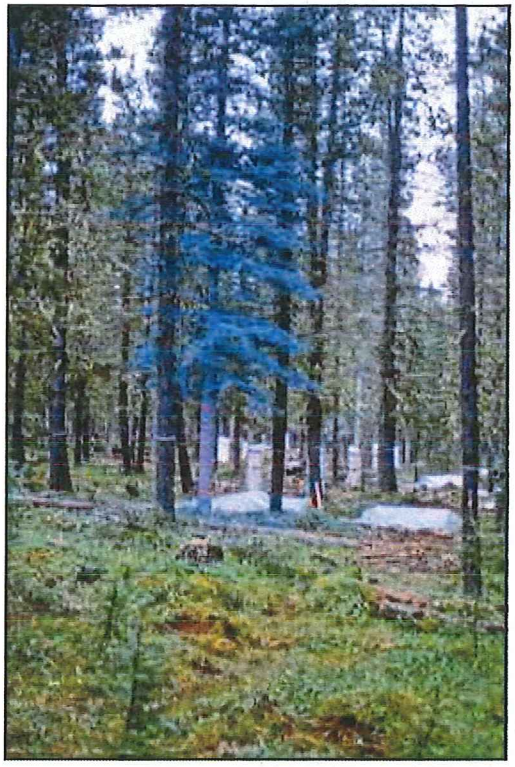
(Below) Two images from the air provide perspectives on the block within the larger landscape. The top image is inside the block, looking west towards the Boule Range. The bottom image is from the north side of the block, looking south towards the the Brule Horse Pasture and the Camp 1 cuts across the river. Only the first pass cuts in the horse pasture were reforested, the second pass cuts were left for forage development.





Athabasca 13, Block 107a - An Explosive Experiment
Harvested 1966
Blown up 1966
Salvage Logged 1967
Scarified for Natural 1967

Although Crossley was a strong advocate for research in the forest, the experiment in this block took the concept to an entirely new level. In 1966 at the height of the Cold War, Canada as part of NATO had troops stationed in Germany, and the Department of National Defense (DND) wanted to prepare them for field conditions in a "European-style managed forest" after a nuclear. DND approached the Company to request help in selecting a forest stand to be thinned and then subjected to the explosion of 50 tons of TNT placed within it. Block 107a was selected, it lay between two blocks logged in 1963, and would normally have been harvested in 1973. Alastair Fraser of the British Forestry Commission arrived in Hinton to mark the trees for thinning, but the Canadian Army had forged ahead with its own version of thinning in the chosen block. Fraser observed that the result bore little resemblance to a European forest, but the explosives were already in place and the Army was anxious to set them off. Many dignitaries, Hinton residents and media representatives turned out to witness the dramatic blast from a distance. The site was salvaged and scarified in 1967 and regenerated with no further treatment or planting.



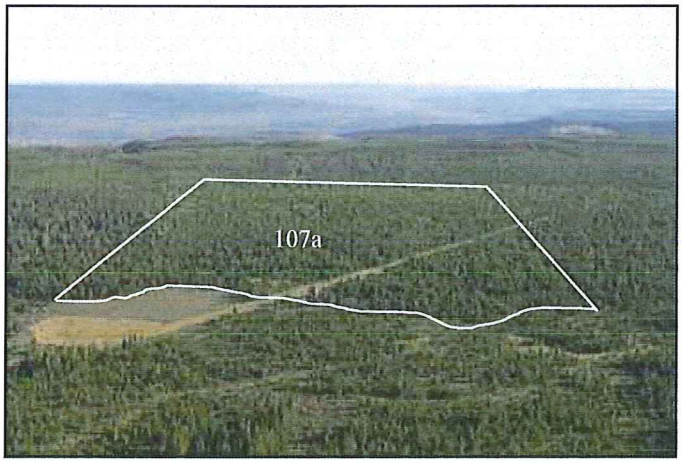
(Above and Right) Explosion

Blast site (above, left) before the explosion, note stumps and debris from thinned trees in foreground, marked trees to be left uncut.

Observers, including many media representatives, were not allowed near the blast but from an observation post several kilometers away the sight and sound was still dramatic.

(Left) Aftermath of Explosion, 1966
Little was left standing in the immediate area (left). Even monitoring towers were destroyed.

(Right) Des Crossley in Block 107a, 1966
Crossley picks up monitoring cables as he examines the aftermath of the explosion before salvage operations began.



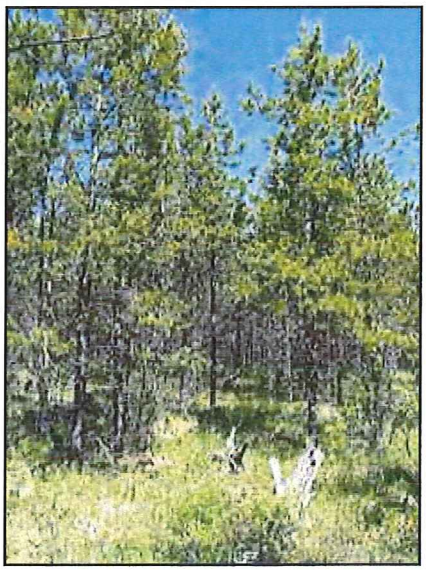
(Left) Aerial Oblique Looking north across Block 107a from the air, 2006.
The wetland in the middle left of the image is at the Southwest corner of the block. White lines approximate the boundaries of the block. Who would suspect that this site was "bombed" 40 years ago?

(Right) Aerial View of Possible Blast Site, 2006
A vertical view from looking from NE to SW shows an area of open forest 2/3 distance between the road and the wetland that may have been the blast site. Photopoint 1 is the white star on the image.

Blocks of the 60s Cont'd
Athabasca 13, Block 107a Cont'd

(Left) Photopoint 1, Block 107a
A healthy 40 year old pine stand grows on the site, adjacent to the access road.

(Below) Photopoint 2, Block 107a
Looking west along the access road.



(Above, Left) Stand Interior.
This image was taken in the open grown site described on the previous page.

(Right) Landscape in the area of Block 107a
Meanwhile, the surrounding landscape shows little evidence that it was once harvested in a two-pass alternate clearcut system.

Berland 4, Block 22
Harvested 1964
Scarified for Natural 1965
Planted 4 ha 1976
Juvenile Spacing 8 ha 1986

(Above) Winter view to south, 1969.
Old "Lower Road" visible on right side of picture

(Above) Jack Wright in Block 22, 1977

(Above) Photopint 1, from old "Lower Road", 2006

(Above) Stand Interior showing old stumps

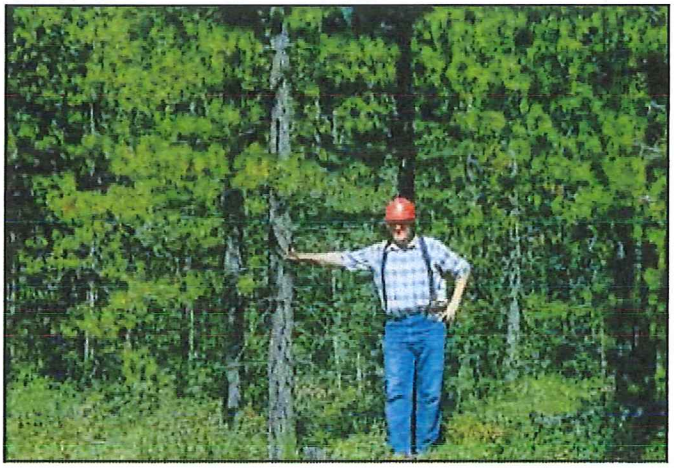
(Left) 2006 Aerial view gives similar perspective to 1969 picture top left

Embarras 3, Block 1
Harvested 1963
Scarified for Natural 1963
Juvenile Spacing 1981

(Above) Block 1, 1995

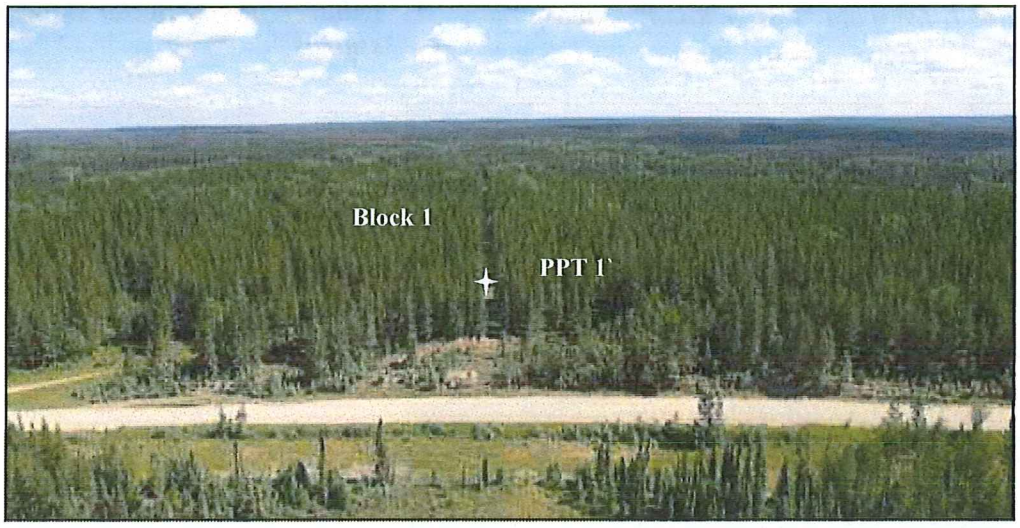
Block 1, 2006 (above)

(Below) David Presslee in block



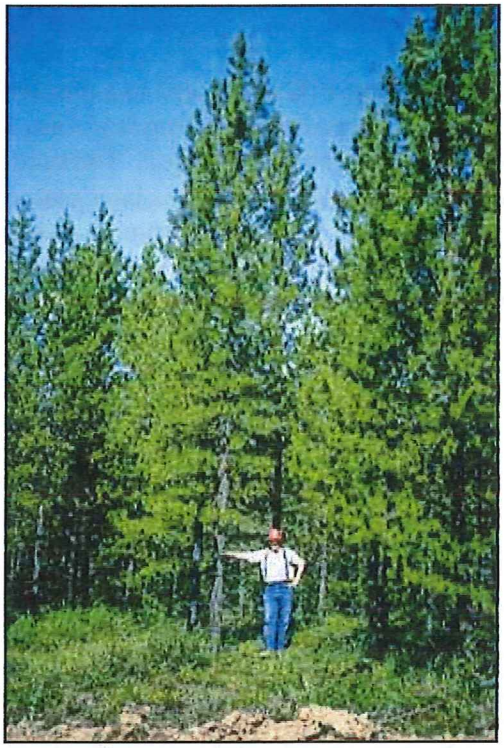
Although we do not have early images of this block, I visited it with Silviculture Manager David Presslee in 1995 and recorded the visit in pictures at that time. Dave was an energetic, innovative and passionate forester who was making major strides in advancing and revitalizing the silviculture program at Hinton. Unfortunately, his contributions were curtailed by his untimely death in January 2000 but these 1985 images capture him in the environment where he was most happy.

(Below) Aerial View looking East

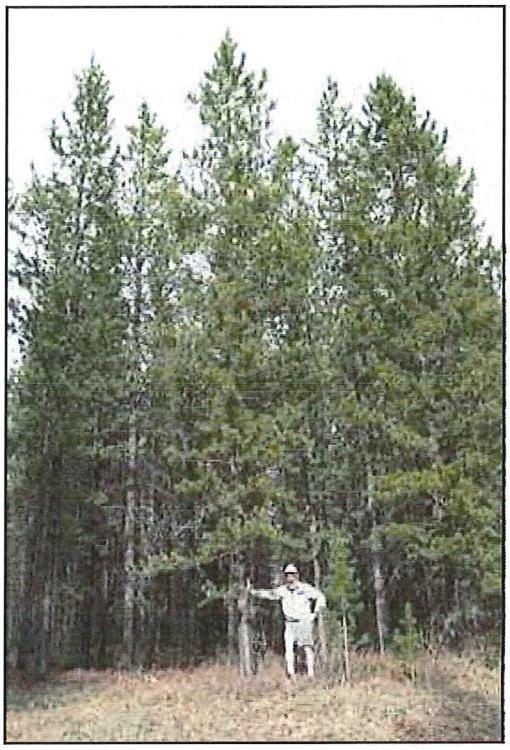


Embarras 3, Block 1 Cont'd

(Below) Presslee in Block 1—1995



(Below)Photopoint 1, Block 1, 2006



(Left) Interior of block (2006) showing stand development following juvenile spacing

(Below) Stumps from the juvenile spacing operation are still visible in 2006, 25 years after treatment.

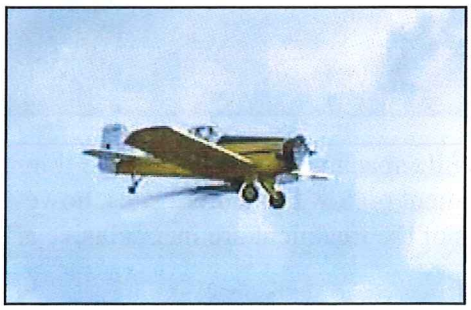
Juvenile spacing, or precommercial thinning(PCT) as it is otherwise known, is a low risk stand management treatment on low to medium sites, however the benefits in terms of AAC or product value relative to the costs of the treatment are inconclusive at this time.

McLeod 1, Block 51Y - Aerial Fertilization Experiments
Harvested 1962
Scarified for Natural 1963
Fertilized 1968
Planted Pl 1970

Concern about the slow growth of regeneration at McLeod Compartment 1 (Camp 1) led to a number of efforts to improve it. In this trial, the Company's Silviculture Manager Steve Ferdinand worked with Sheritt Gordon to develop a fertilizer mix designed for the dry, highly calcareous sites at Camp 1. The mixture, 27 - 27 - 0 with iron chelate added as a trace element to neutralize the calcareous effect, was later marketed by Sheritt Gordon as a popular garden fertilizer mix. In the trial, the fertilizer did little to promote conifer growth, and in fact promoted competition as it was captured by grass, shrubs and herbs in the block. It apparently produced good forage, because Steve Ferdinand reports that he shot deer out of this block in the two consecutive years following the treatment.

(Above) A Snow Commander cropdusting aircraft spreads fertilizer, 1968.

The subsequent planting to pine proved fruitless, as all pine plantations in McLeod 1's windblown, calcareous sites have proven to be. The block continued to restock itself to white spruce and aspen, both doing well in 2006.



Blocks of the 1960s

McLeod 1, Block 51Y Cont'd

(Left) Photopoint 1, Block 51Y

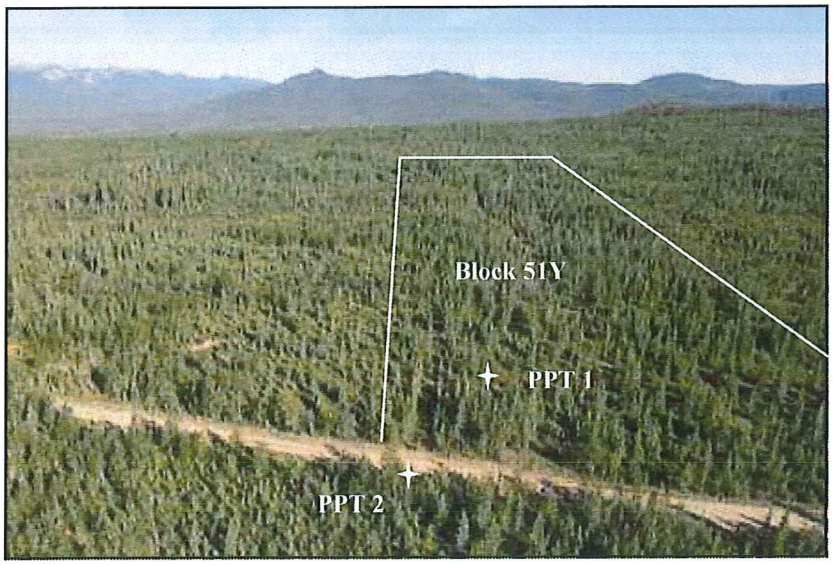
(Below) Photopoint 2, Block 51Y

Trees in this block originated following seedcast from the standing trees in an adjacent uncut strip aligned at right angles to the prevailing winds. Growth in this compartment is slow due to the harsh environment characterized by unusually dry conditions and - because of its proximity to the Yellowhead Pass - unremitting winds.

However, studies have shown that these regenerated trees are growing at rates that surpass those of the natural forests from which they sprang.

(Below) Aerial View of Block 51Y looking north

The aerial view of this block - centred above the road - shows it between two second pass blocks, both of which were site prepared and planted to spruce. Boundaries between passes (white lines) are beginning to blur. Camera photopoints shown as white stars



McLeod 1, Block 168Y - Planting "Ontario Tubes"
Harvested 1962
Scarified 1963
Planted 1969

A 1969 planting crew is planting "Ontario Tubes" while maintaining proper planting spacing as they move across the block. A flag line is set and the first planter follows the line, while the others distance themselves three steps (about three metres or nine feet) apart. A hole is punched into the ground with the "dibble" seen in the planter's hand at left and the seedling, still in the split plastic tube, is inserted. One person carries the seedlings, distributing them as the crew moves forward in line, planting about 450 trees/acre (around 1100 trees/ha). As each flag is passed, it is moved over to establish the next line.

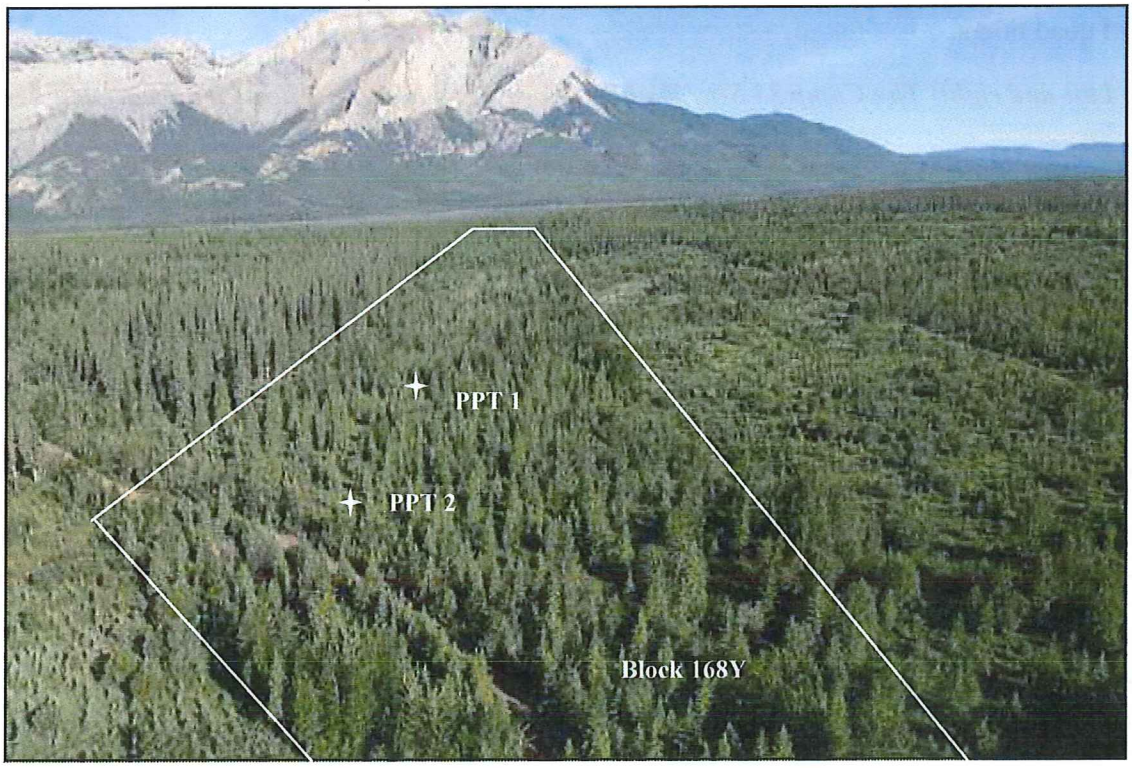
There were problems with "Ontario Tubes". In theory the trees as they grew would split the tube and the roots would emerge along the sides. In practice, this rarely happened and the roots emerged out the bottom if at all. There were associated problems with frost heaving and excessive drying of the seedlings. Ravens proved to be a nuisance as well, often plucking the tubes out of the ground.

At left, staff member Rod Rowley—who later became a crew foreman before resigning to go into private business demonstrates the custom-built tray carrying system mounted on a Himilayan pack frame.

(Left) Block 168y, Photopoint 1
A good young stand of white spruce is now growing on this site, mostly from natural seedthrow from the adjacent uncut residual, which has become popular with ATV users and is heavily impacted by random camping (below)

(Right) Block 168y, Photopoint 2
This image shows the relative size of the regeneration in the block, while an aerial view (below) shows the block stretching towards Brule Lake with the uncut residual at left and Block 913 (1985) to the right. The road in the image is near the bottom of the block.

(Below) Oblique Aerial View Looking Northwest
At Camp 1, the company experimented with 5 chain and 10 chain strip widths for natural seeding. Both worked well, Block 168Y was a 5-chain strip (boundary in white).



Other Forest Industry: Sale Unit Operations

When Company operations began in the 1950s there were several timber berths and other licensed operations already working on the FMA. Some chose to continue to operate their berths until their licenses expired, the last of these ended in 1968. Others, such as Terris Lumber and Bighorn Forest Products chose to work under the Company's licence as Sale Units, taking the products they needed from their operating areas and selling the residual pulpwood to North Western Pulp & Power. The Company did all the block planning, annual operating plan preparation and post-harvest site preparation and reforestation for the blocks harvested.

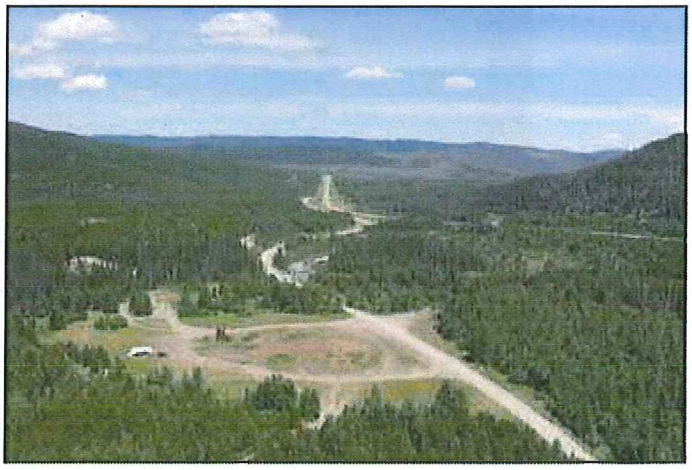
Bighorn Forest Products operated in McLeod 2 for many years, initially from Hinton and later moving its millsite and burner to the old Camp 33 site after the Company's camp was decommissioned in the late 60s. Bighorn harvested overstocked pine stands that, although mature, had very low merchantability due to small stem diameters. Bighorn used these to produce fence posts, selling the merchantable stems to NWP&P for pulp-

(Above, left and right) Camp 33 site in 1965 and in 2006.

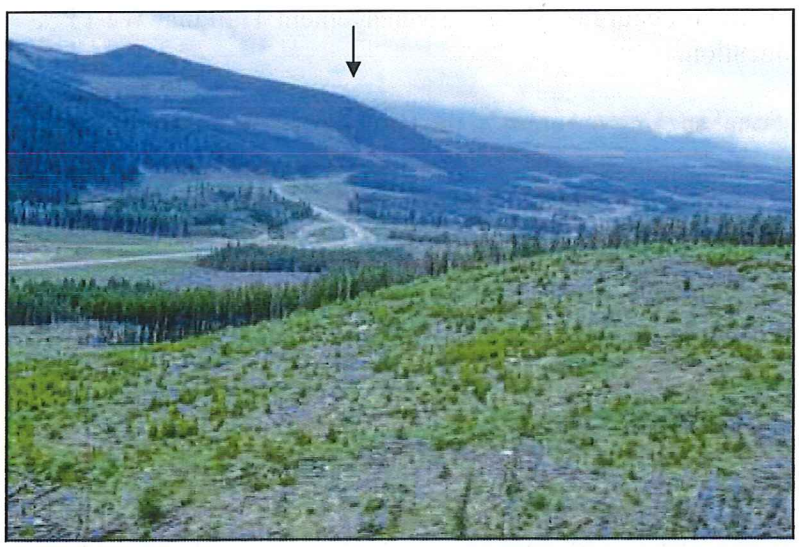
No longer used by industry, the old campsite is now a very popular random camping site, particularly with groups of quad riders.

(Below. Left and right) The Camp 33 Site/ Bighorn Forest Products millsite as it appeared in 1981 and 2006.

The intervening years have blurred the pattern of cut and leave. The impact of the 1997 "Christmas Fire" can be seen on the right horizon of the 2006 image. Bighorn's abandoned "teepee burner" for sawmill residue burning can be seen in the 2006 image, just to the right



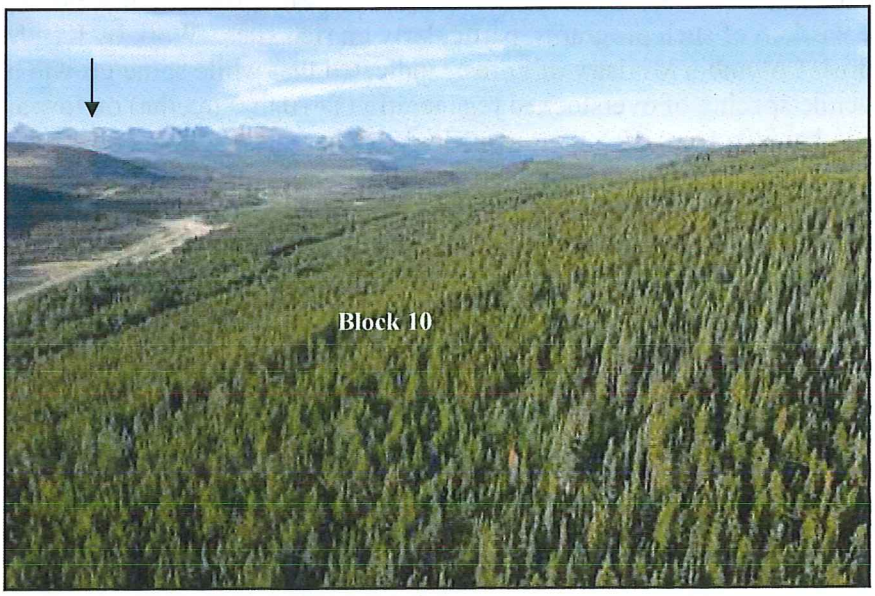
McLeod 2, Block 10
Harvested 1960
Scarified for Natural 1962
Precommercial Thinning 1977



(Left) Aerial View to South, 1972
10 years after harvest, regeneration is well established on the block.

(Below) Aerial View to South, 2006
The 2006 image facing south shows the same perspective with the block fully stocked and growing well.

A discussion on landscape convergence, later in this report includes a photo series of the hillside that includes this block and Block 27, discussed in the next few pages.



(Left) Photopoint 1
The author near the bottom of the block on the access road just above Hwy 40. Shooting North

Juvenile Spacing Program

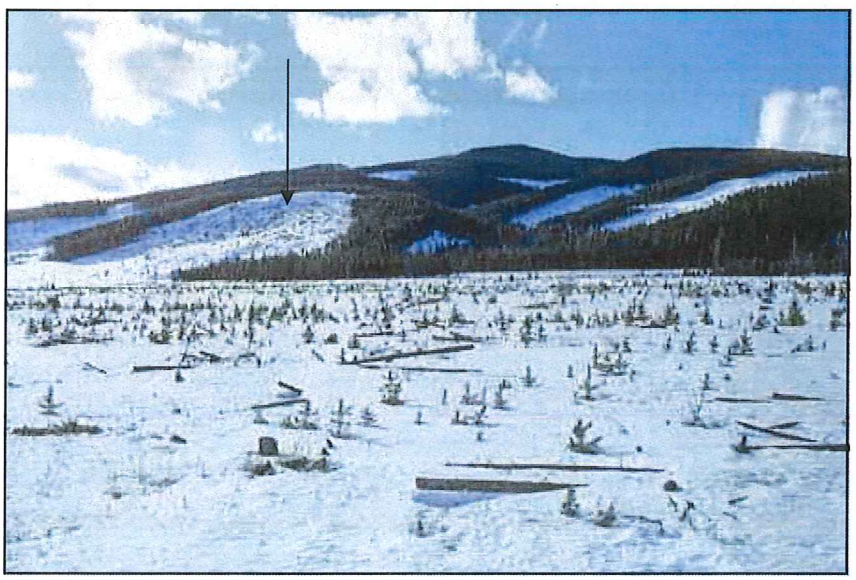
In 1963, the Canadian Forest Service established spacing trials in the 1956 Gregg Burn where growth in the "dog hair" pine—up to 1,000,000 stems per hectare—was stagnating. These trials, still maintained today, demonstrated the growth and yield benefits that would accrue from spacing in such overstocked fire origin stands. The CFS and Company foresters experimented with a number of other possibilities for juvenile spacing in the Gregg Burn and these are described in the brochure for the Pine Management Trail that West Fraser continues to maintain for public use and education.

In the early 70s, the Company began an operational spacing program in the Gregg Burn, initially using Swedish brush axes, later switching to brush saws. By the mid-70s it was apparent that the costs of this program (approx $4300/ha in 2006 dollars) were prohibitive compared to any estimate of future benefit and it was discontinued in 1976.

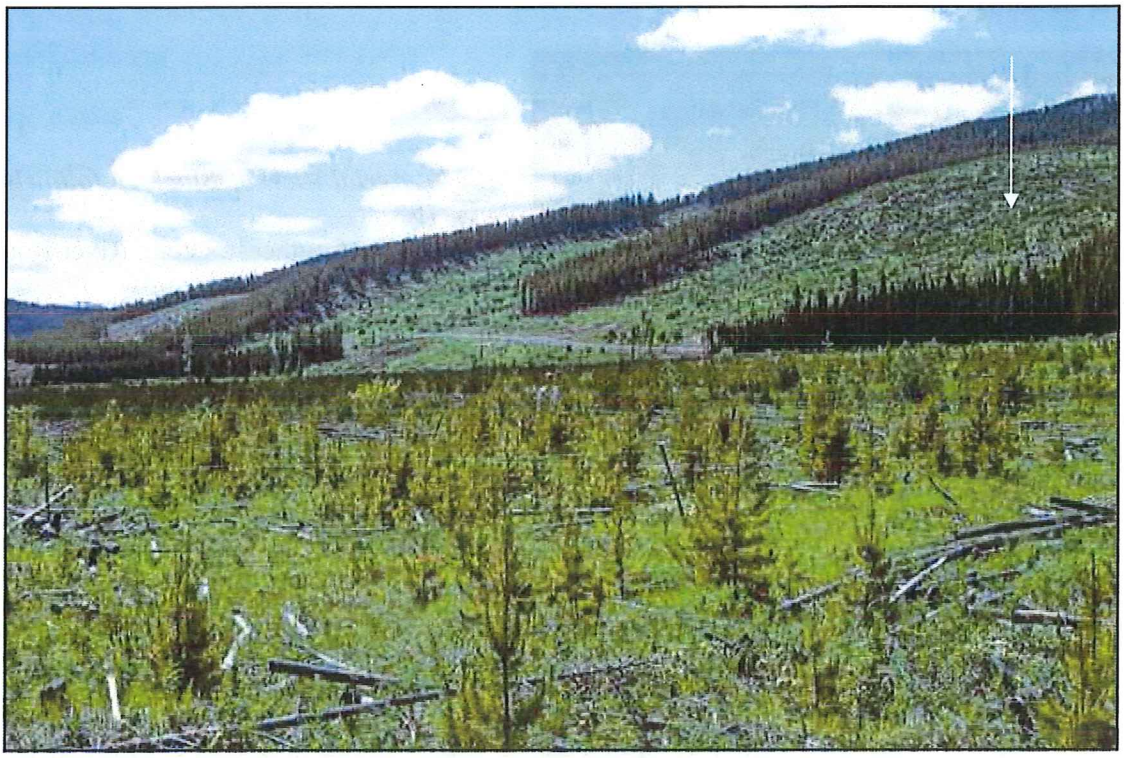
Juvenile spacing moved over to regenerated stands in 1977, and the block next featured (McLeod 2, Block 16) in this report was the first block so treated. Benefits expected from this program included higher final volumes at the time or harvest, and also the accelerated development of individual trees within the thinned stands which would thus be "set up" for a commercial thinning program as the trees approached maturity. In 1977 the juvenile spacing crew began working in such stands throughout the Forest Management Area, treating 200-300 ha/year.

By the late 1980s, costs were continuing to rise and growth and yield experts were beginning to challenge the wisdom of such programs, particularly on rich sites. Work by Ken Mitchell and Jim Goudie from the British Columbia Ministry of Forests indicated that while some growth and yield benefits could derive from juvenile spacing of overstocked regeneration (>10,000 tree/ha) on low and medium site classes, there would be no benefits from such treatments in the richer sites. Others noted risks such as pathogen attacks facilitated by stem damage during thinning, invasion of competitive species, loss of site occupancy etc. Juvenile spacing was suspended pending a more careful review of the site and stand-specific benefits and costs of such enhanced forest management treatments compared to other EFM treatment options for the same investments.

McLeod 2, Block 16
Harvested 1960
Scarified for Natural 1961
Precommercial Thinning 1977

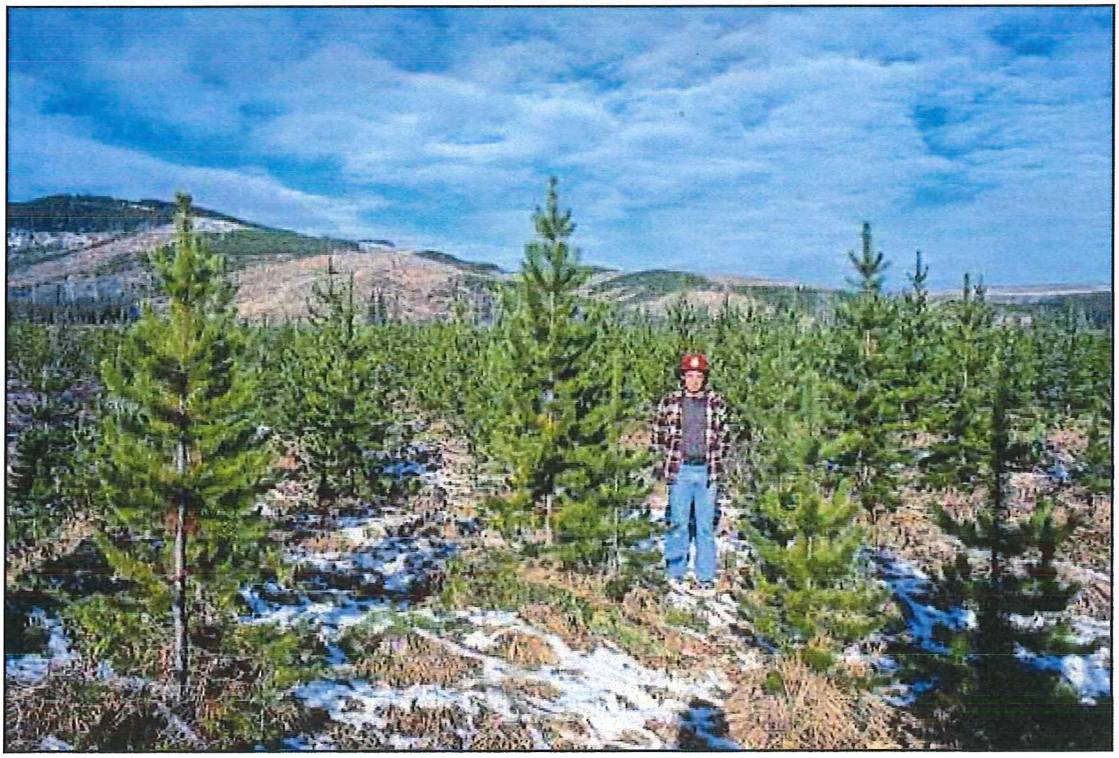


(Left) Block 16 in 1972
This 1972 image of Block 16 is towards Hwy 40 and the blocks on the hill above it. Block 10, described on Page 45 is shown by the arrow in the image.



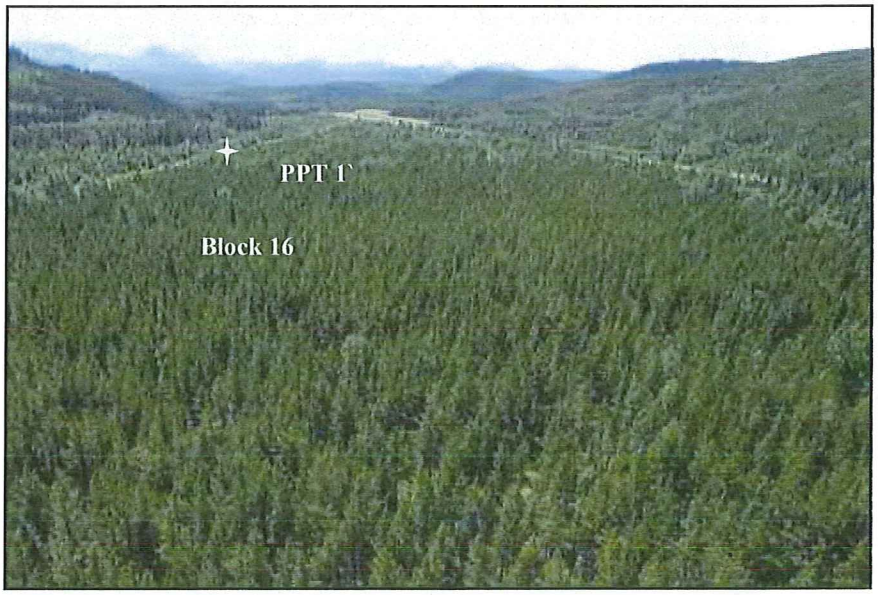
(Above) Jack Wright inspects a stocking plot in Block 16, 1973.
Block 10 (see p 43) is shown by the arrow.

(Below) Block 16, fall 1977
Peter Sziklai, Company Tree Improvement Forester stands in the newly-spaced Block 16, fall 1977.



McLeod 2, Block 16 Continued

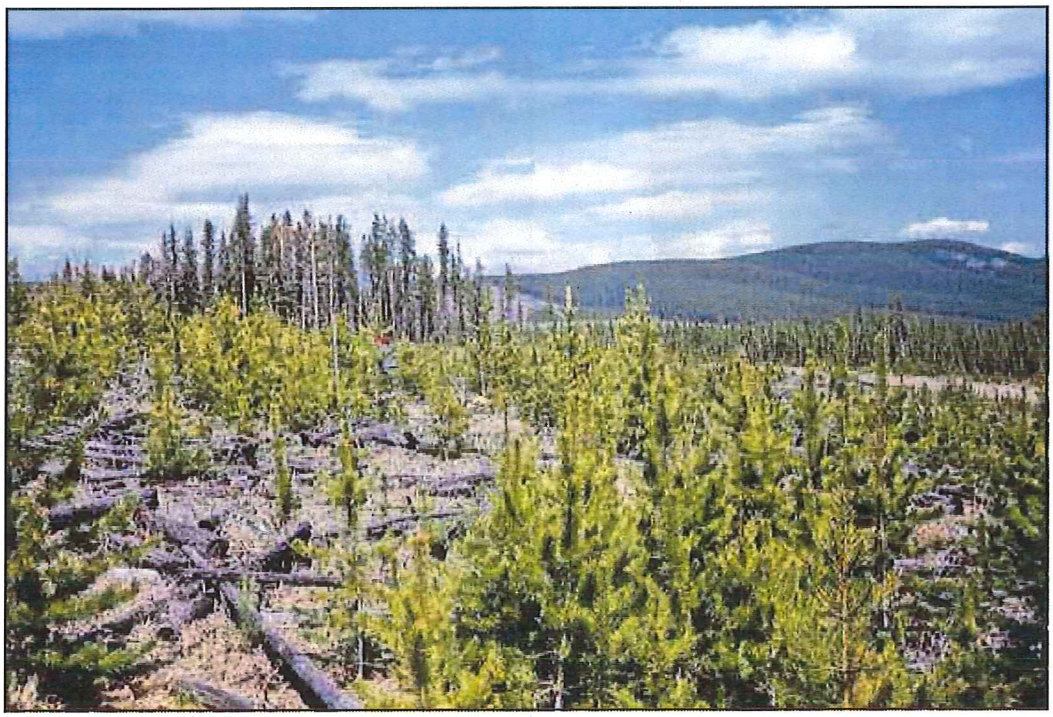
(Left) Aerial View of Block 16 following spacing, 1977.
View to the Southeast, Gregg River Road in background



(Right) Aerial View of Block 16, 2006, looking southwest.
Gregg River Road on left, Hwy 40 on right of image. The site is fully occupied with young vigorous pine with dominant heights around 12m. Camera photopoint is the white star.

(Below, left) Photopoint 1, Block 16. The view from the Gregg River Road. Beside it is an image from inside the block showing well developed stems, many of them merchantable.

McLeod 2, Block 27 - "The Two Metre Rule"
Harvested 1962
Scarification for Natural 1962
Juvenile Spacing 1977

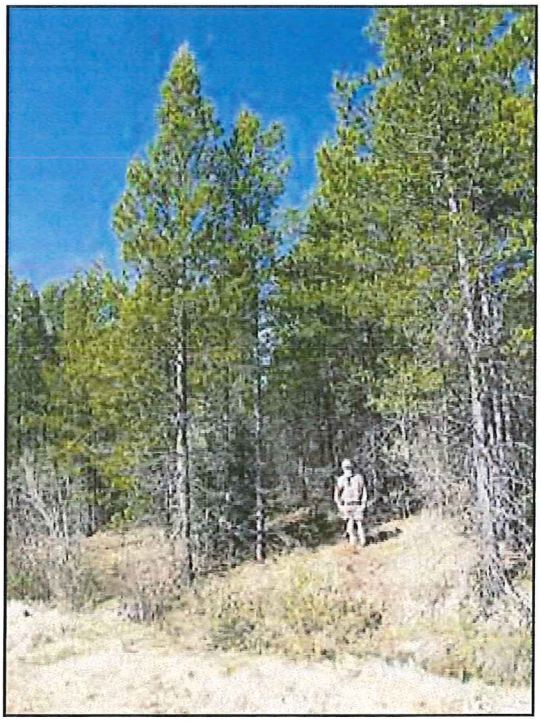


(Left) A research plot in Block 27, 1973.
11 years after harvest, the pine regeneration is well advanced. Hwy 40 intersects the picture, and the hills on the south side of the Gregg River are in the background.

(Above) Forest Protection Superintendent Brent Simmonds and Horse in Block 27, 1973
In 1973, the Fish and Wildlife Division was urging the Company to change the Ground Rules to delay second pass harvest until regeneration in the first pass achieved an average height of two metres. Crossley strongly opposed this, and sent Brent Simmonds and his horse to record a series of pictures to support his hypothesis that large ungulates could easily be screened by average regeneration heights shorter than two metres, as evidenced in this block.

McLeod 2, Block 27 Continued.

(Below, left and Right) Photopoint 1, Block 27
These images show the location of the block along Hwy 40 south (Sphinx Mountain on the horizon) and the size of the regeneration relative to the author.

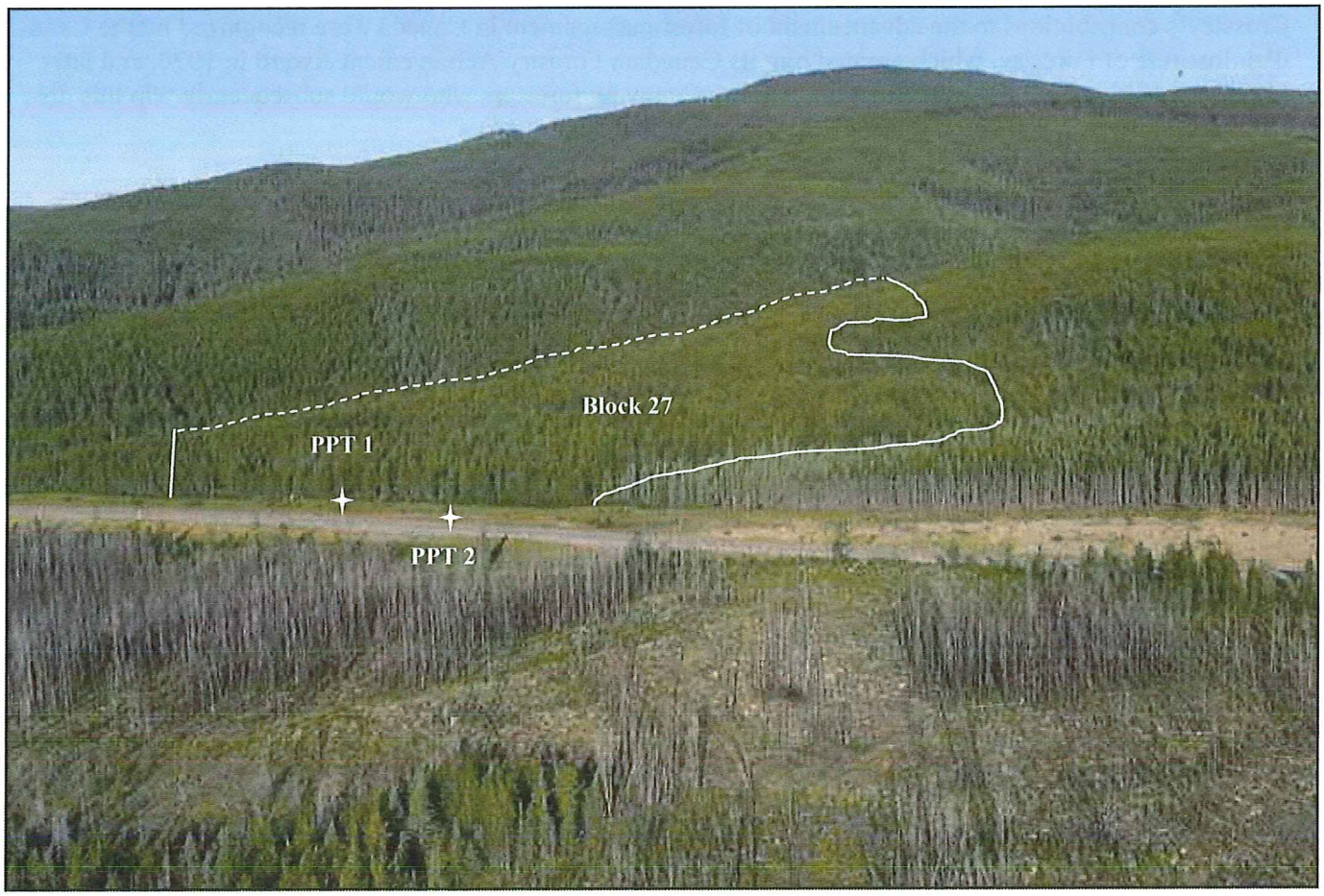


(Right) Photopoint 2, 2006

View of the stand from Hwy 40. Note the old Company interpretive sign at mid - right of image and below (left).

(Below) Aerial view of Block 27, 2006, shooting northwest

The block is adjacent to Hwy 40 and stretching up the hill from mid-frame, approximate boundaries in white. The boundaries between first and second pass harvest have disappeared with the passage of time. In the foreground of the picture is an area of fire-killed timber, some of it now removed by firewood cutters. In the early morning hours of Dec. 14 1997, high Chinook winds fanned embers from a highway clearing project and two fires spread down the Gregg Valley consuming 3,000 ha of reforestation, old forest stands and younger lodgepole pine regrowth from a 1956 fire. This was the point of origin of one of those fires.



(Right) 1998 Image showing the aftermath of the December 1997 "Christmas Fire" in the Gregg River drainage.

Blocks of the 1970s

Historical Context

The pace of change accelerated in the 1970s, as many events within and external to Company operations impacted all aspects of forest operations and management. Failure to expand operations required under the 1968 Agreement led to the canceling of the expanded FMA which reverted to its original size in 1971. Meanwhile, a 50 million fbm studmill, a partial deliverable of the 1968 Agreement, began operations in 1972.

Crossley's contributions to the advancement of forest management in Canada were recognized by the Canadian Institute of Forestry, which granted him its Canadian Forestry Achievement Award in 1970, and later (1979) made him a Fellow of the Institute. Other Company foresters who would subsequently win this distinguished award include Don Laishley (1996) and Bob Udell (2006).

Timber Development Area hearings were held for the Whitecourt (1970) and Grande Cache (1979) areas, resulting in the granting of Forest Management Agreements to Simpson Timber Limited and British Columbia Forest Products Limited. The Company submitted an unsuccessful bid, which included an expanded pulpmill and lightweight coated paper plant at Hinton for the Grande Cache TDA.

The continuing and expanding controversy surrounding oil and gas versus forestry rights on the land was clarified when the new 1971 Forests Act clearly conveyed ownership of the trees on FMA lands to the FMA holder. This set the stage for the development of the Timber Damage Assessment program in Alberta.

In 1971 a new Progressive Conservative Government under Peter Lougheed ended 30 years of Social Credit rule in Alberta and led to a complete review of all government policy and agreements.

C.D. Shultz & Company delivered the "Shulco Report" - ***"The Environmental Effects of Timber Harvesting Operations in the Edson and Grande Prairie Forests"*** - to the Minister of Lands and Forests in 1973. Among the many conclusions was that "Timber harvesting can remain as a principal and highly legitimate use of the project area."

Des Crossley retired as Chief Forester in 1975, and was replaced by Jack Wright.

In 1977, the **Forest Regeneration Conference** in Quebec City was sponsored by Canadian Forestry Association and Canadian Institute of Forestry. It highlighted nation-wide problem with inadequate forest regeneration. The Hinton program was cited as a notable exception to this sorry record.

A series of forest land use studies along the foothills led to publication of ***A policy for resource management of the Eastern Slopes*** in 1977. Eight zones were described and maps showed their locations. Parts of the northern areas affected the Hinton FMA area.

Also in 1977, the **Environment Council of Alberta** began hearings on the ***Environmental Effects of Forestry Operations*** in Alberta. Retired Chief Forester Des Crossley was appointed as one of four panel members, along with Bruce Dancik (chair), J.F. Reynolds and Alistair Crerar (ECA *ex officio*). Its 1979 report was generally complimentary to the province and industry, but it also included several recommendations aimed at further and continuous improvement.

In 1978, the Company name changed to **St. Regis (Alberta) Ltd.** from **North Western Pulp & Power Ltd.**

Forest Policy and Planning

In 1970, the second complete measurement of the original Continuous Forest Inventory plots was completed and the third measurement in the 10-year remeasurement cycle began with the renaming of the program to the **Permanent Growth Sampling (PGS)** program. The new title reflected the program's emphasis on measuring the growth and volume yield of forest stands.

In 1973, the Company began its recreation program with the start of construction on the **Wild Sculpture Hiking Trail.** This was a tangible expression of the Company's commitment to public use and enjoyment of the FMA that continues to this day. In the early 1970s the Company had also assisted the Junior Forest wardens to reconstruct a 12 mile (20 km) portion of the Bighorn Trail, the former Dominion Forestry trail to the Gregg River which is still maintained by the Company.

1977 saw the second revision of the Forest Management plan, under lead author Bob Udell.

Ground Rules

The Ground Rules were renegotiated in 1973, with major changes in a continuing pattern of expansion and specificity that placed more emphasis on "rules" than "guidelines as suggested in the preamble. Additional stream protection guidelines were included, and standards for road construction and road classification were added. Management of allowable cut by working circle and five year periodic cut control was introduced. The FMA was divided into "foothills" and "lowland" zones with maximum block sizes for each. Maximum block size 500 acres (200 hectares) in "lowland" zone. Minimum standards of merchantability and reforestation stocking standards were introduced, including the "two metre rule" (notwithstanding Crossley's objections and horse pictures). Planning for "contingency wood" was now required to forestall any future "emergency wood" crises such as those of the late 60s. The document grew to 21 pages including appendices.

Forest Operations

In 1974 a large Progressive Clearcut experiment began in the Berland Working Circle. In the next four years, over 5000 acres (2023 ha) would be cut as part of this large scale program.

(Above) Berland 5 Progressive Clearcut as it appears in 2006.

The trend to mechanized operations continued in the 1970s. In 1976 a self-loading truck program was introduced and proved to be an efficient system to assure wood delivery during inclement weather conditions, and in the late 70s trials began using shearhead feller-bunchers with grapple skidders to replace conventional (hand falling, line skidders) harvest systems.

Silviculture

In 1970 Crossley prepared a report proposing an intensive silviculture program on the FMA, but it was not implemented, as the allowable annual cut was in excess of current mill requirements.

In 1972, **Save Tomorrow Stop Pollution (STOP)** member Arnim Zimmer presented a damaging report on the Company's operations, alleging erosion problems and lack of regeneration. A subsequent Company and AFS investigation negated its findings, but the report was very controversial at the time. In 2006, a Foothills Model Forest project is re-examining the blocks highlighted in the STOP report.

Problems with the Ontario Tube containerized seedling program led, in 1972, to Steve Ferdinand working with Hank Spencer to design the Ferdinand Rootrainer containers for seedlings. These seedlings were grown in containers which opened like a book, allowing the planter to lift the seedling out and drop it into a planting hole prepared by the Finnish Pottiputki tool, which replaced the dibble used for the Ontario Tubes.

In 1976 the Bracke Scarifier was introduced as a site preparation tool to address continuing problems with site preparation for planting, especially in McLeod 1 (Camp 1). The scalps produced by the machine proved very effective in preparing planting sites, a major step towards the reforestation of second-pass cuts in the wind-parched compartment.

In 1979 the Cazes & Hepner (C & H) plough was introduced to address problems with excessive vegetative competition, especially poplar. On about 10 per cent of planting sites, the rapid growth of hardwoods (aspen) created too much competition for the conifer seedlings. A C&H plough was acquired in 1979 and mounted on a modified Komatsu tractor in an attempt to deal with this problem.

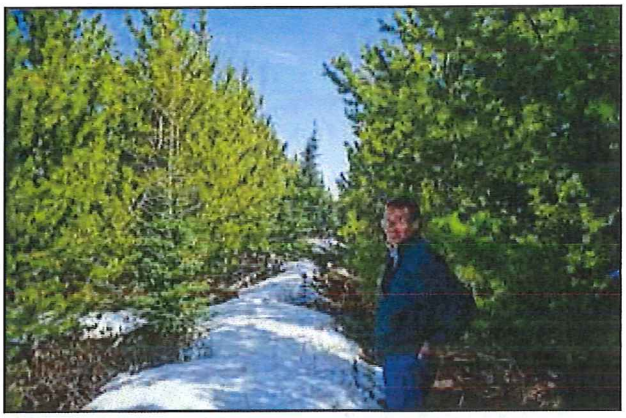
(Above) Bracke Scarifier at work in McLeod 1, 1976.

Blocks of the 1970s - Images and Discussion

Athabasca 14, Block 619 - Reforestation of Cold Organic Sites

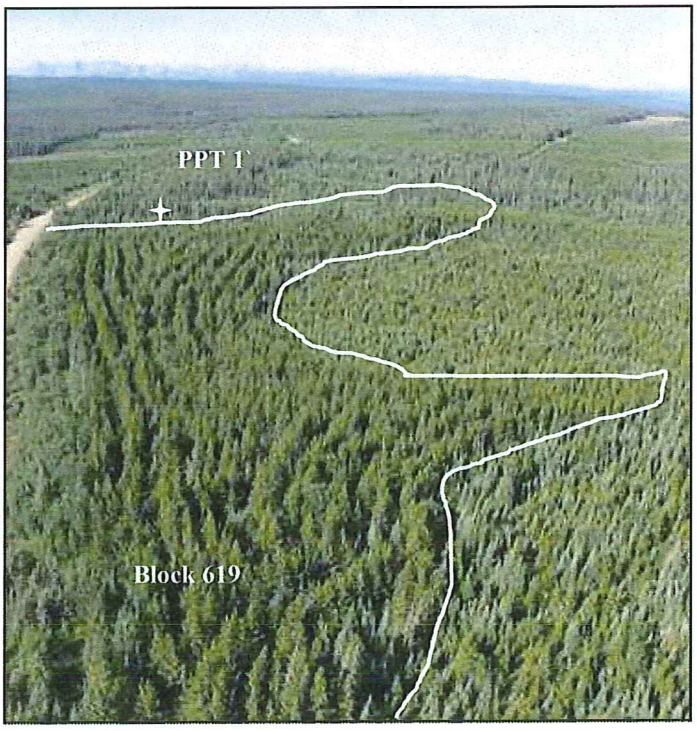
Harvested 1972
Bladed 1973
Planted Lodgepole pine and White spruce 1973

Reforestation was difficult on the cold, deep organic sites prevalent in poorly drained overmature forest stands such as those on the plateau north of Hinton. Horse logged sites generally reforested with advanced growth already growing on the site at time of harvest, but some of these suppressed trees were already decades old and slow to respond to release. With the advent of mechanized skidding used in the second pass harvests, advanced growth was destroyed, and the sites had to be planted. In the 1970s the Company used front mounted plows to strip the cold duff away and expose mineral soil for planting. This treatment was successful, and the trees quickly caught and surpassed the growth performance of the advanced growth in adjacent blocks. However, plowing to mineral soil also removed nutrients and today's favoured treatment is "mounding" (digging out and overturning a mound of earth), with seedlings planted on top of the mounds.



(Right) Block 619, 1973
In 1993, the Company's newly-appointed Chief Forester **Rod Beaumont** visited Hinton operations and toured this site. The windrows from the bladed strips are clearly visible between the planted rows of trees.

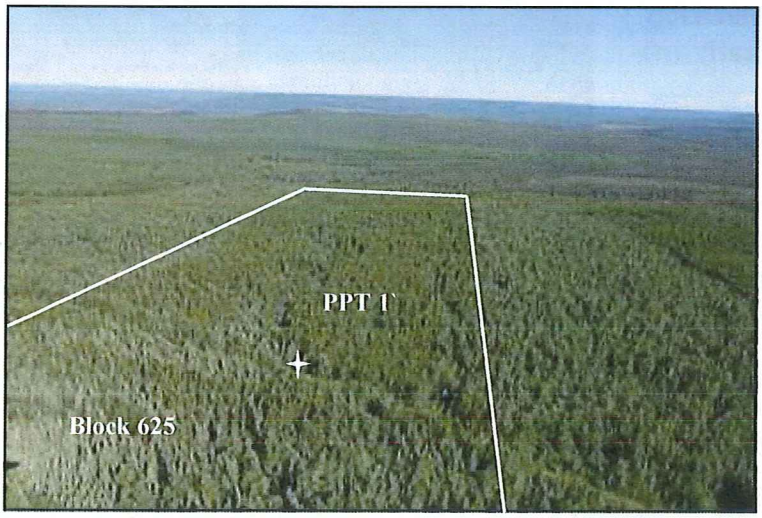
(Above) Photopoint 1, Block 619, 2006
Considerable growth has ensued since the 1993 visit. The white star at right is the approximate camera photopoint.



(Right) Oblique Aerial View, 2006
The bladed rows are still visible in this 2006 aerial image looking south along the Fish Creek Road. Block boundary in white.

Block 625, Athabasca 14
Harvested 1972
Bladed 1973
Planted pine and spruce 1973

(Right) Block 625, 1977
Four years after treatment, the young planted pine was beginning to peek above the grass in the bladed rows, looking northwest down the Barbara Creek Drainage.



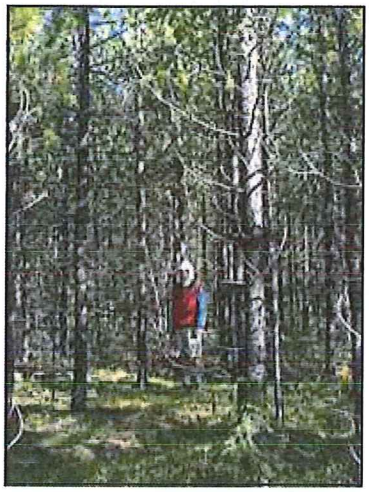
(Left) Aerial Oblique of Block 625, looking northwest, 2006
In 2006, the same perspective shows the site fully occupied by regenerated pine and spruce. Block 625 is outlined in white, Photopoint 1 is the star.

(Right) Photopoint 1, 2006.
The author stands in a small clearing adjacent to the old access road visible in the photo above, and just east of the Barbara Creek headwaters, also visible in the aerial image. Leader growth on the pine and spruce on this moist, rich site is remarkable.

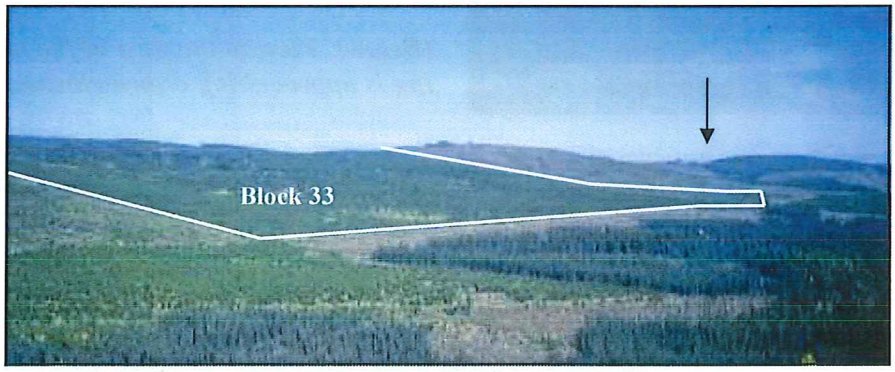
McLeod 7, Block 33
Harvested 1973
Scarified for Natural 1973
Juvenile Spacing 1987

This block, as well as the adjacent Block 118 featured later in this report, is often visited by Company as well as Model Forest tours in the Gregg River area. The two blocks are separated by 14 years and offer a good opportunity to see the progress of stand development in regenerated cutblocks over time.

(Above, Left and Right) Photopoint 1 in 1993 and in 2006. Considerable height growth has ensued.

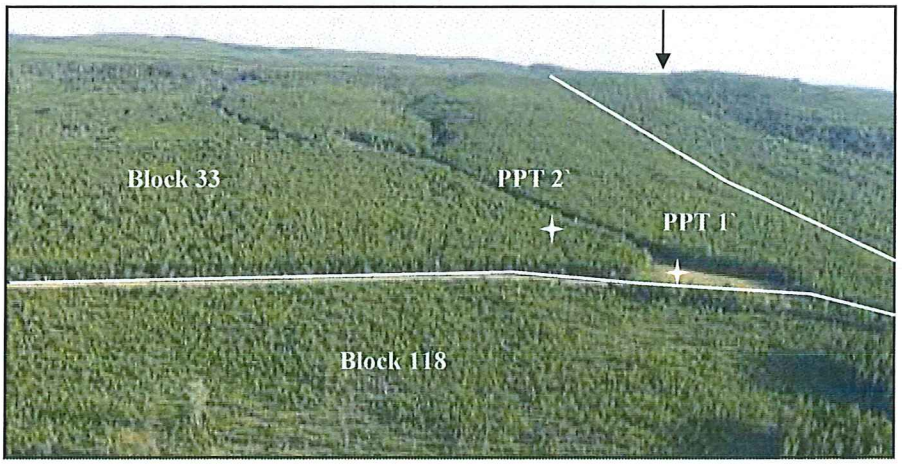


(Left) Photopoint 2, inside the stand. At this point, 33 years after harvest, average dominant height is about 10 metres, and many stems are merchantable.



(Right) Aerial views in 1993 and 2006, looking north.

Block 33 is north of the road, block 118 south. **Photopoint 1** (star) is in the clearing at the road junction.



Berland 5, Block 24—Progressive Clearcut Experiment
Harvested 1975
Scarified for Natural 1975

Between 1975 and 1978, approximately 5,000 acres (2000+ hectares) were harvested in a large experimental clearcut in Berland compartments 2 and 5. The large experimental cut was divided into blocks for administrative purposes, but each block flowed into the next and Block 24 was one of them, cut in the early days of the experiment.

(Above) Views of the large clearcut advancing to the east in 1975 (left) and 1977 (right)

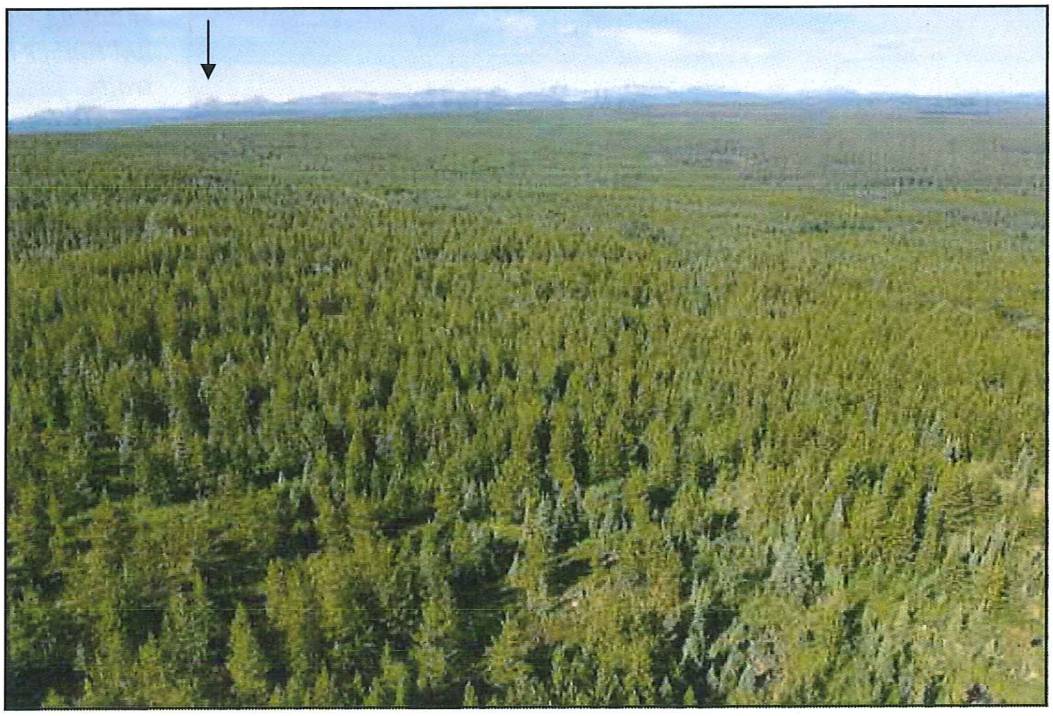
(Left) Treelength truck on haul road through large clearcut, circa 1976.

(Below) View to the west of the large clearcut in 1994. Full pine stocking is approaching crown closure.

Photopoint 1, Block 24, 2006
Fast growing pine has achieved crown closure and dominant heights of around 8 m.

(Left) A 2006 aerial view to the east showing same general area as the images at the top of the face page.

(Below) 2006 view to the west showing progress since 1994 image lower page left. Office review of this image revealed a black bear, somewhat surprised at our flypast - bottom right of image.



Berland 2, Block 37 - A Puzzling Viewscape
Harvested 1978
Scarified for Natural 1979, 1980

Block 37 and Block 36 just to the east of it are separated by a narrow corridor. Together, they approach 400 ha in size and are just north of the progressive clearcut experimental program in Berland 5.

(Right) Aerial View looking northwest, 2006

The view of Block 37 from a distance is puzzling. Dark lines cross the hillside which, viewed closer, are actually old timber berth roads. Jack Wright, retired Chief Forester, explained that these were built for Kennedy's railroad tie operation, a selective cut. When the Company came to log the remaining trees, pine was well established on the trails, and the Fish and Wildlife Division asked that they be left as wildlife corridors. This increased costs, as each corridor became a barrier to what would have been a relatively straightforward hillside tree length logging operation with long downhill skids to a landing at the base of the hill.

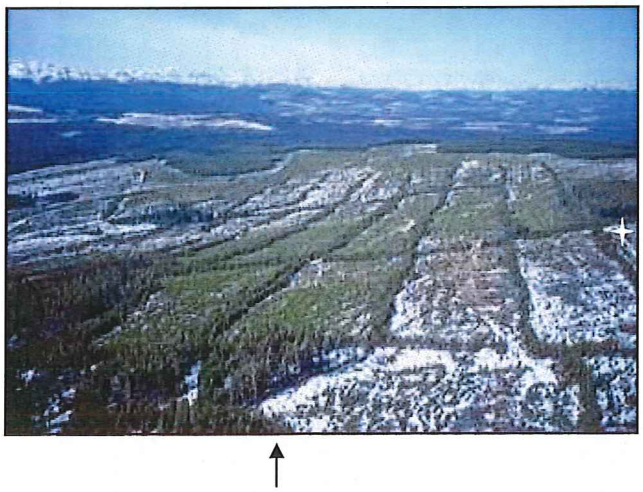
(Left) 2006 aerial oblique from east side of Block 37, shooting west along old timber berth trails.

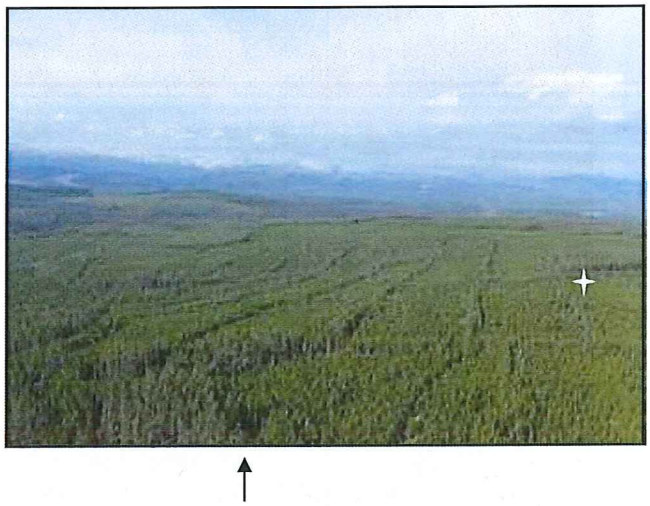
This perspective gives a closer view of the corridors and size of the pine in them relative to the regeneration established since 1978.

(Above, Left and Right). Images taken in 1979 and 1994, towards the east. White stars are common reference points on this page.

(Above) a view from below the block, looking north

(Above) A closer view of the treelength decks in the block, awaiting haul, in 1979.





(Above) Westward views of Block 37 in 1994 and 2006 Note the increase in tree crown closure in 12 years.

McLeod 2, Block 570 - 1981 Greenhouse Opening Demonstration
Harvested 1975
Scarified for Natural 1976
Bracke Site Preparation 1981
Planted pine 1981

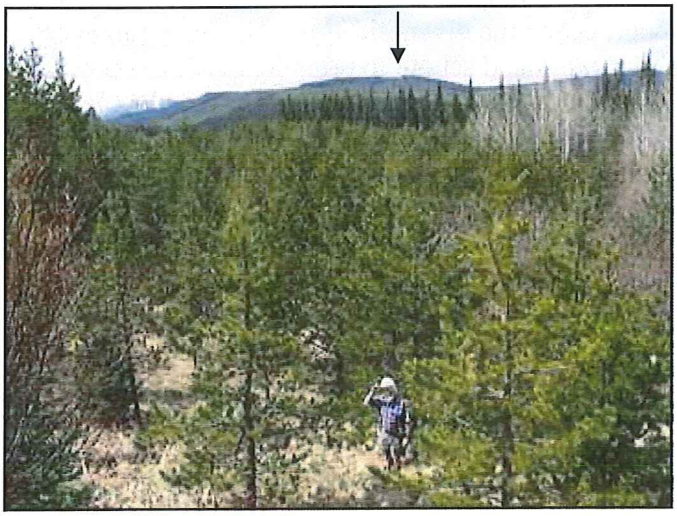
In 1981, the Company officially opened its new greenhouse for the production of Spencer-Lemaire seedlings. The old greenhouse had outlived its usefulness and was unable to produce the 3 million trees/year now needed for the program. The new greenhouse could grow 1 million trees per charge, or 3 million trees per year in much improved growing conditions. A number of dignitaries attended the opening, and enjoyed a tour of the new greenhouse as well as a field tour to observe Bracke site preparation and tree planting in Block 570.

By 1999, privatization of the nursery business in Alberta, combined with the withdrawal of government support for seedling production costs, had resulted in a very competitive greenhouse business environment. The Company greenhouse could only provide about 30% of the Company's annual seedling requirements, and high quality seedlings were now available from private growers at costs the Company's unionized greenhouse could not begin to meet. It was closed that year, and is now West Fraser's Greenhouse Learning Centre.

(Left) Interior view of greenhouse, 1981.

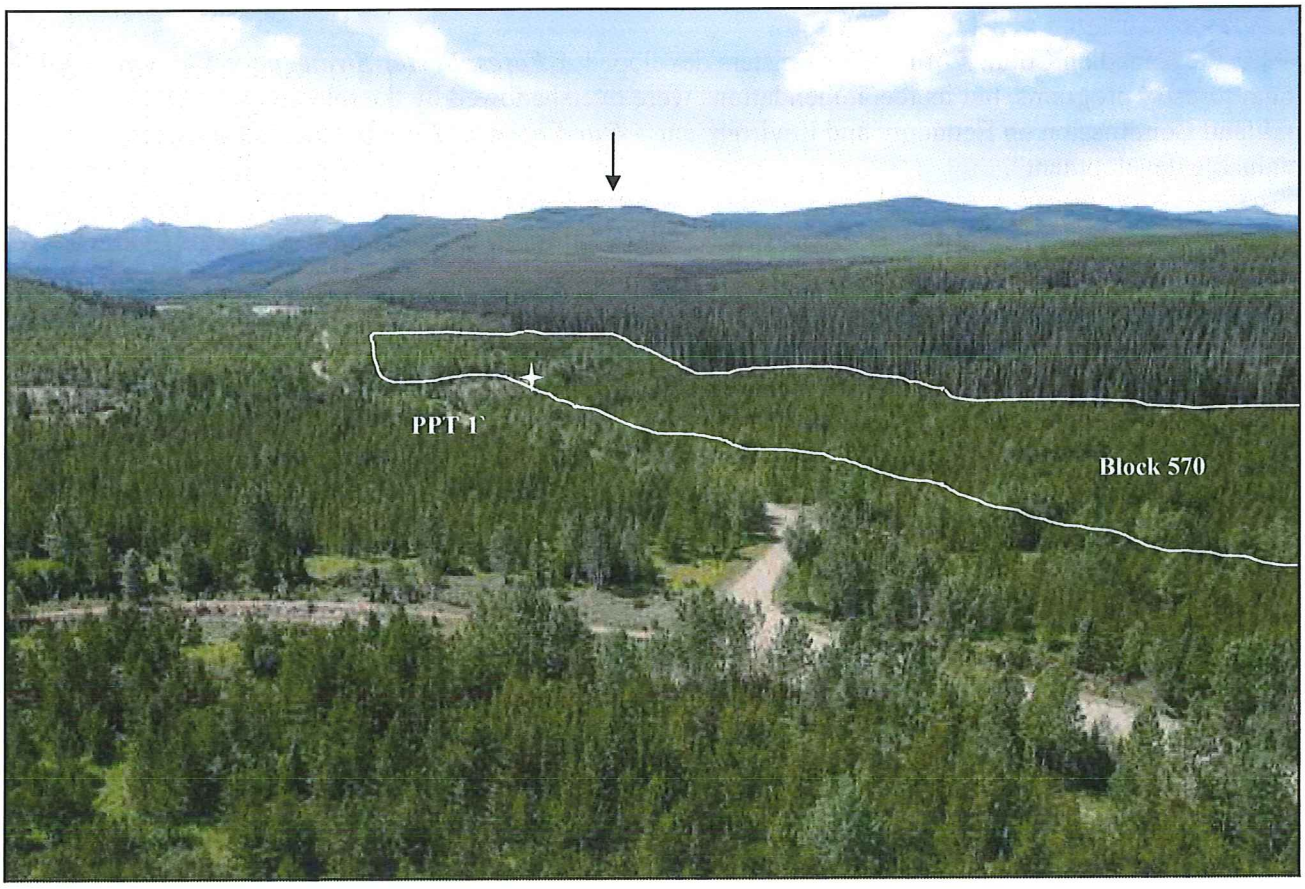
(Below) Tree planting demonstration, block 570, 1981.

(Right) Bracke Site Preparation, Block 570, 1981
Tour participants also saw the Bracke Cultivator at work on Block 570, scalping out planting sites.



(Left) Photopoint 1, Block 570, 2006
A fully stocked stand of 25 year old lodgepole pine attests to the success of the planting exercise.

(Below) Block 570, 2006 aerial oblique view to Southwest
Block 570 stretches southwest along Drinnan Creek. The star shows the photopoint, the white line is the approximate block boundary.



Blocks of the 1980s

Historical Context

Coal markets continued strong in the early 80s and a new coal mine announced by Union Oil of Canada just north of Hinton removed 3200 ha of reforested land from the Company FMA.

In 1982, retired Chief Forester Des Crossley was awarded an honorary doctorate at University of Toronto for his pioneering work on industrial forest management at Hinton. He died in 1986.

In 1984 the Government of Alberta produced a White Paper on Economic Development in which the forest industry was identified as one of the pillars that would support economic diversification. The Forest Industry Development Division of the AFS was established shortly thereafter and set out to promote the development of Alberta's unallocated forestlands to new FMAs. Their remarkable success led to public controversy over the rapid expansion of the forest industry.

In 1985, author **Donald MacKay** wrote "Heritage Lost" - a book casting a critical eye on the state of forest management in Canada. A notable exception to this criticism was the operation at Hinton which received high praise in the chapter "Des Crossley's Obsession".

(Left) Author **Donald MacKay** (l) and **Des Crossley** (r) examine an experimental scots pine plantation in Athabasca 16, 1984.

In 1987, the Canadian Council of Forest Ministers developed ***A Forest Sector Strategy for Canada*** to guide national forestry programs, but its recommendations were overshadowed by the release of the UN's Brundtland Commission on Economy and Environment - ***Our Common Future*** - that encouraged "sustainable development".

With the merger of parent company **St. Regis Paper** with **Champion International**, **St. Regis (Alberta) Limited** became **Champion Forest Products (Alberta) Limited** in 1985. Resident Manager **Ken Hall** continued his quest for expanded operations at Hinton, and in 1988 his efforts culminated with the announcement of a new sawmill and expanded pulpmill, along with an expanded FMA. The same year, **Champion International** sold its Hinton holdings to **Weldwood of Canada Limited** and the name changed again.

In 1989, with the public controversy over industry expansion still making headlines, the Province appointed an **Expert Panel on Forestry**, chaired by **Dr. Bruce Dancik** of the University of Alberta. Company forester **Bob Udell** was a member, along with **Lorne Brace** of the CFS and **Dr. John Stelfox** of the Canadian Wildlife Service. One of their report recommendations led to the **Alberta Forest Conservation Strategy** in 1997.

Forest Policy and Planning

In 1982, a major forestry/wildlife conference in Jasper culminated with the offer by the Company's Woodlands Manager **Jim Clark** to use the Hinton FMA as a testing ground for an integrated wildlife/forestry program. A joint Company/government task force was struck, tendering its report in 1986 and setting the stage for the ensuing program on the FMA. **Jim Clark** and Chief Forester **Jack Wright** were Company representatives on the task force.

Rick Bonar was hired in 1988 to develop and head up the new wildlife program on the FMA - the first such program in Alberta. A joint Company/government standing committee - the **Integrated Resource Management Steering Committee** was struck to oversee the joint commitments and implementation of the program.

Major work continued on the growth and yield of regenerated lodgepole pine, particularly the improved growth rates relative to those of fire origin stands. This work as factored into the third revision of the Forest Management Plan in 1986.

The Company's **Forest Management Liaison Committee (FMLC)** was established "to provide input to the Company's forest management plan" and started meeting in January 1989. This was the first Public Advisory Committee in forest management in Alberta

Ground Rules
The Ground Rules were revised and expanded in 1980, including additional refinements for stream and environmental protection. Company-specific reforestation stocking standards were no longer defined, the standards were now linked to timber management regulations. They were revised and expanded again in 1986 to reflect the new emphasis on Forestry/ Wildlife management. They now expressed the intent to develop wildlife guidelines and identified elk and caribou as "Featured Species". The rules grew to 32 pages.

With the expansion in 1988, new Ground Rules were developed, identifying the East Slopes Policy as a guiding document. The wildlife management process was introduced and defined, including the zoning of the FMA, and the role of the joint Company/ government **Integrated Resource Management Steering Committee**. The trend to increasing size and a "rules" focus continued as the document grew to 44 pages.

Forest Operations
By the late 1980s, the major harvest system was comprised of sawhead feller-bunchers, cable and grapple skidders with high flotation tires, stroke delimbing at roadside and wood hauling with self-loading trucks. The increasing mechanization of the woods meant a dramatic reduction in accident rates from powersaw use. An integrated bush chipping operation was also introduced.

In 1986, a major department restructuring saw all operational responsibility, including silviculture, centred in "Forest Operations".

With the 1988 expansion and mill startup in 2000, operations were expanded to support the increased fibre needs of the facilities. This included the introduction of a number of independent contractors to supplement the production from the Company logging crew.

Silviculture
A new larger greenhouse was constructed in 1980 to replace the old facility which could no longer provide the trees required for the planting program.

In 1980 blading of deep organic sites (deep duff) was replaced by the Craig-Simpson rear mounted ripper plough, in order to extend the season of treatment as well as reduce site impacts compared to those of blading.

In 1986, the Company proposed a series of small herbicide trials testing the newly approved forestry herbicide Roundup as means of vegetation control. One permit was approved and treatment implemented on a Block in Marlboro Compartment 11, featured on Page 67 of this report.

In the late 80s, better utilization and the trend towards younger harvest areas made site preparation easier. Lighter tractors pulling barrels and chains began to replace the heavier Crossley Plough/ anchor chain system.

Blocks of the 1980s—Images and Discussion

Athabasca 13, Block 773 - Forest Recreation Development
Harvested 1980
Bracke Site Preparation 1984
Planted pine and spruce 1984

In the early 80s, the Company was considering options to replace the Pine Management Ski Trail. Although it was still popular with the public, the trail was difficult to maintain because of its relatively low elevation and susceptibility to warm Chinook winds. The "Camp 29" location seemed ideal with its high elevation (1470m) and reliable, consistent and heavy snowfalls. Logging planning for second pass harvest was underway. Company Superintendent Oliver Hannula - himself an avid skier and former National Team member - spearheaded the design of harvest and logging roads to support their subsequent conversion to the Spruce Management Ski Trail System. By 1984, the trails were fully developed, including the new St. Regis Marathon Ski Trail, and the trail system hosted the Canadian Cross Country Ski Championships. It would be the prime ski trail for Hinton Nordic Skiers until their new Nordic Centre on Hwy 40 north opened in the late 1980s. Led by Jack Wright, a volunteer group from Hinton - the **Friends of the Spruce Management Trail System** - continue to maintain the "Camp 29" trails, with support from West Fraser.

(Left) Ski chalet at the trailhead
Formerly a Company coneshed this shed was refurbished courtesy of Hinton Lumber.

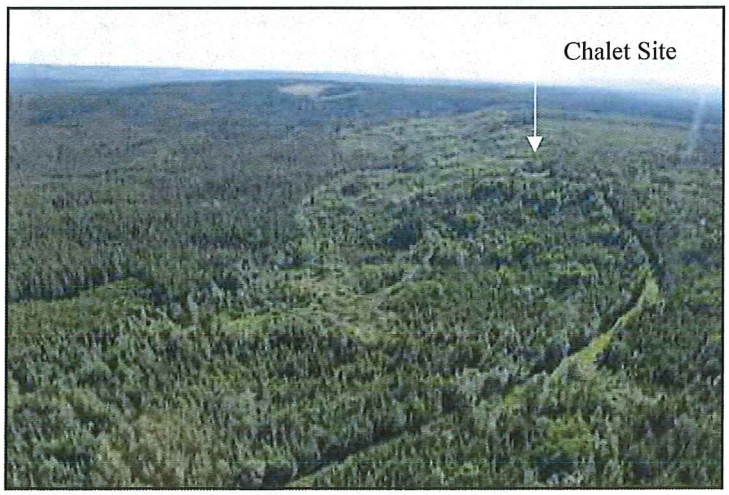
(Right) Photopoint 1, Block 773 looking west
This photopoint is located at the old chalet site.

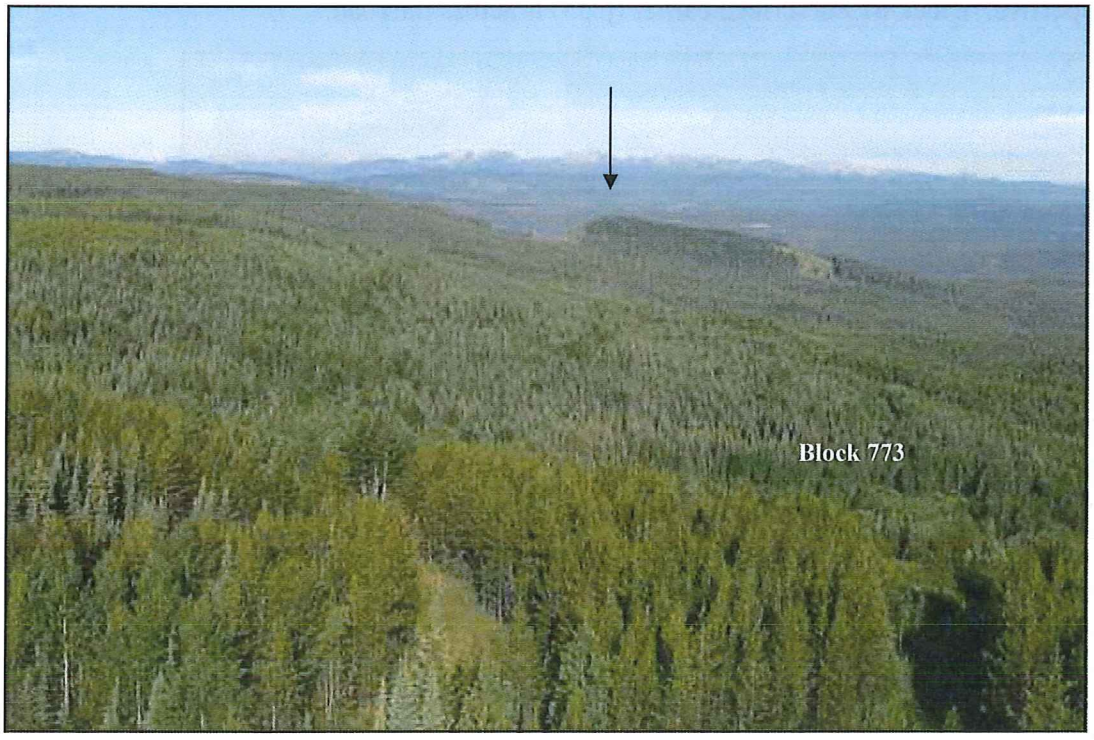
(Below) The view from the future chalet site as trails were being developed, 1982.

(Above) Trail Development below chalet, 1981

(Above) Trails nearing completion, 1982

(Right) Block 773 from the west, looking towards the chalet site in 2006 (Photopoint 1 - arrow) in the small opening just after the ski trail turns up the hill. Block is fully stocked with pine, spruce, fir and aspen regeneration.





(Left) 2006 aerial view to the west, taken from just above chalet site to a similar perspective as bottom image on the opposite page.

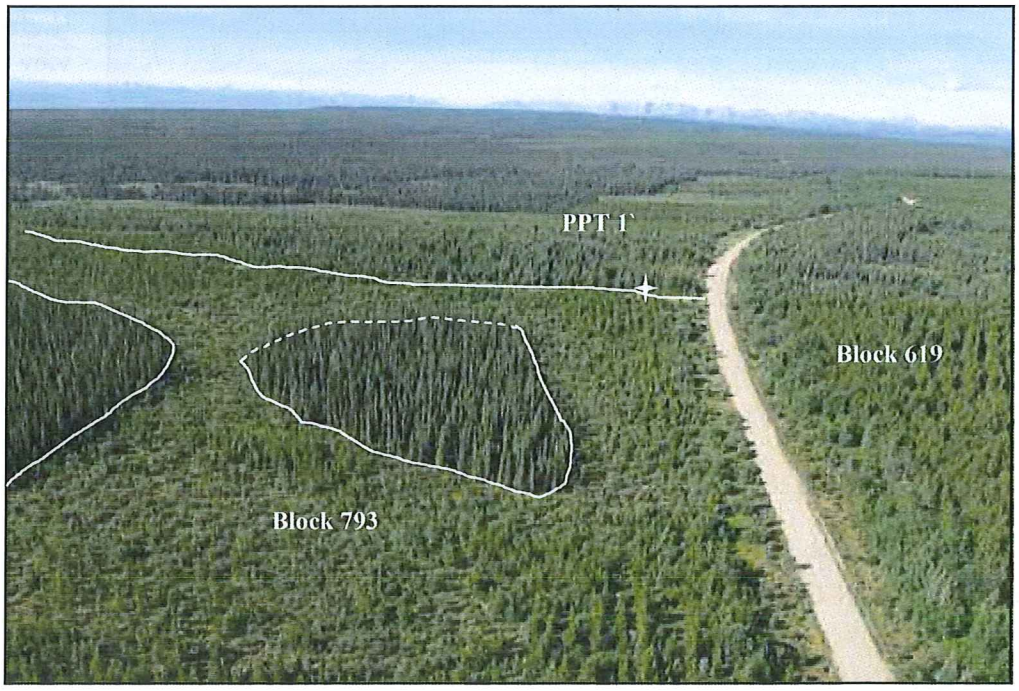
Athabasca 14, Block 793
Harvested 1982
Site Prepared CS Plough 1984
Planted pine 1985

In the 1980s, the Company stopped using heavy-handed blading to site prepare deep organic sites and switched to the rear-mounted Craig Simpson Ripper Plough. This block, just across the road from Block 619 described earlier, is one example of this treatment.

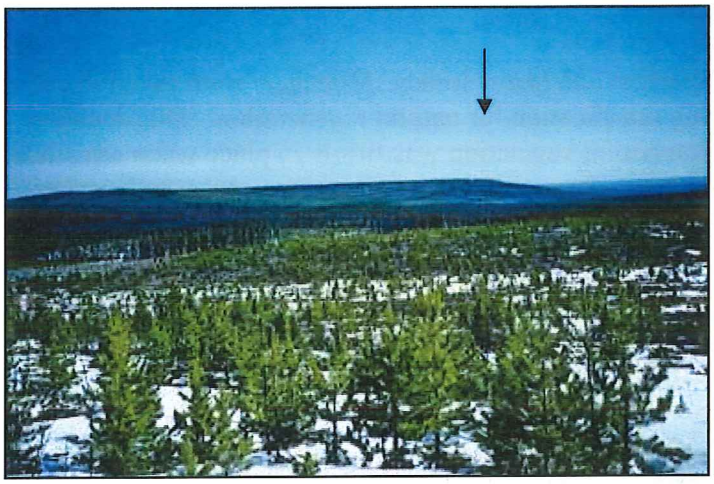
(Above) 1993 View of Block from access road at south end. Young pine is growing well 8 years after planting

(Above) Photopoint 1, 2006 24 years after harvest. Same perspective as 1993 photo.

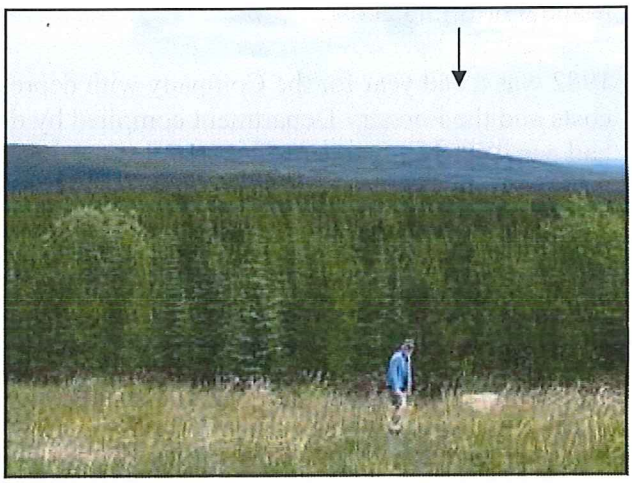
(Below) Block 793 in 2006, view looking south. The block boundary is shown, along with the camera photopoint (white star). Images above were shot towards this perspective. Block 619 described earlier (p.55) is across the road.



Berland 5, Block 90
Harvested 1980
Scarified for Natural 1981
Planted pine 1988

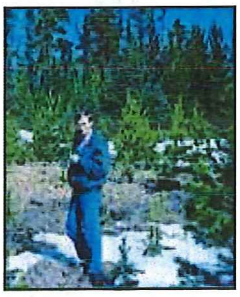


(Above) Block 90, 1994

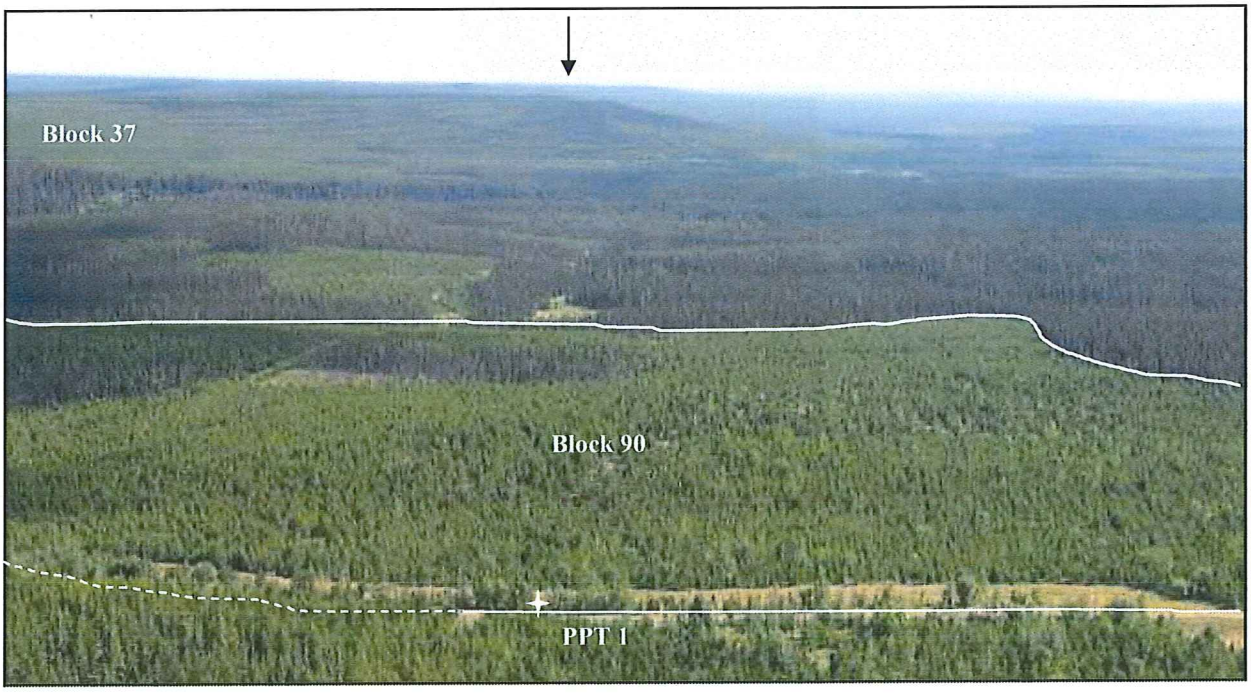


(Above) Photopoint 1, 2006

The 1994 picture of Block 90 was taken during the visit of the Company's Chief Forester **Rod Beaumont** (right). In both the above images, as well as the 2006 aerial image of Block 90 below, the "wildlife corridors" of Block 37 Berland 2 are evident.



(Below) Aerial Oblique of Block 90 with Block 37 Berland 2 in the Background. The block boundary is shown in white, along with the location of Photopoint 1.



Marlboro 11, Block 38 - Herbicide Experiment
Harvested 1982
Scarified for Natural 1984
Bracke Herbicider Site Prep 1985
Planted pine and spruce1986
Manual brushing 1992
Manual brushing 2000

1982 was a bad year for the Company with depressed markets and heavy losses. Managers were asked to cut costs and the Forestry Department complied by deferring scarification for natural regeneration. This decision had particularly adverse results on rich sites, because competing vegetation was firmly in place when scarification eventually occurred. Block 38 epitomizes this challenge. It was apparent that - two years after harvest - scarification for natural was not going to succeed. Immediate site preparation and planting was prescribed, and the block was selected for experimental application of the newly approved forestry herbicide Roundup. Others were planned, but a strong environmentalist lobby in the midst of a provincial election persuaded the Company to defer these plans. Meanwhile, herbicide use by other Alberta forest companies continued to increase with little or no controversy elsewhere in the Province.

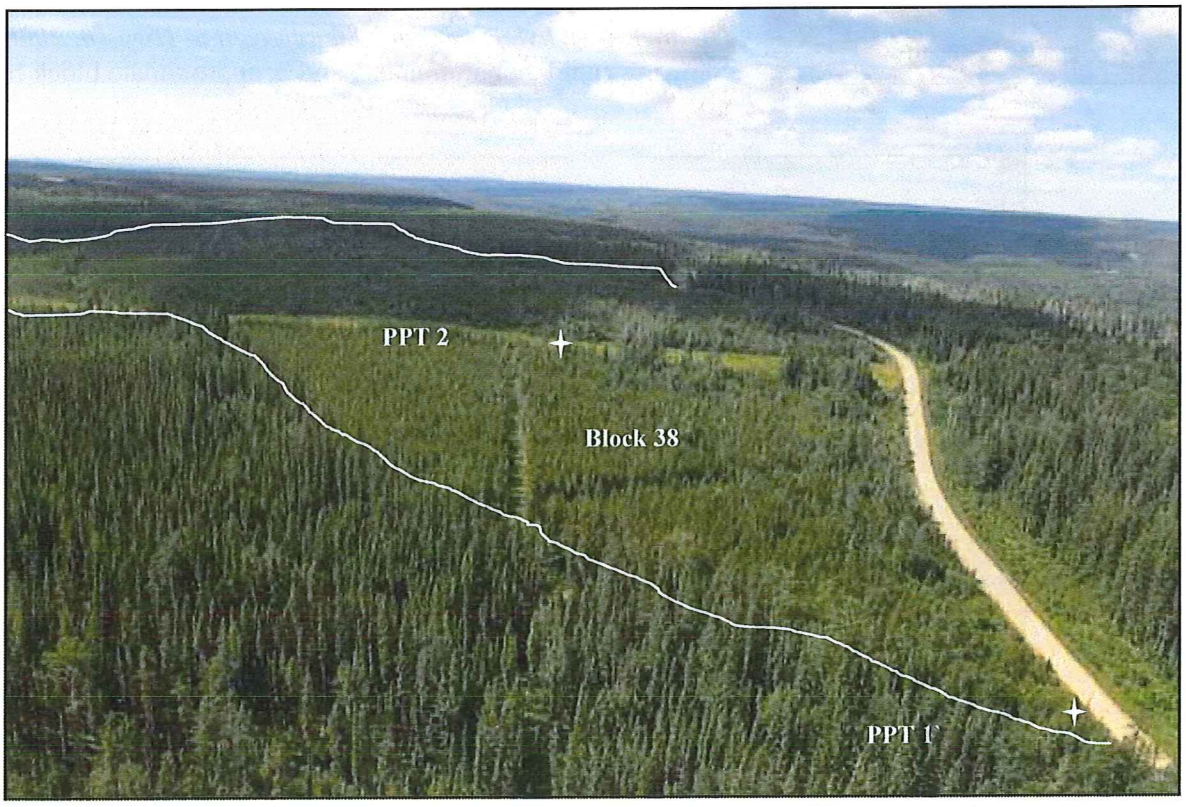
(Left) Bracke herbicider at work in Block 38.
The herbicide was carried in a tank mounted on the Bracke and the rotating action of the mattocks triggered an intermittent spray that would surround each scalp. The machine did not work well, and this block has twice since been manually treated to release the planted trees from competing vegetation.

(Right) AFS Forester Neil Barker reprimed the herbicide pump

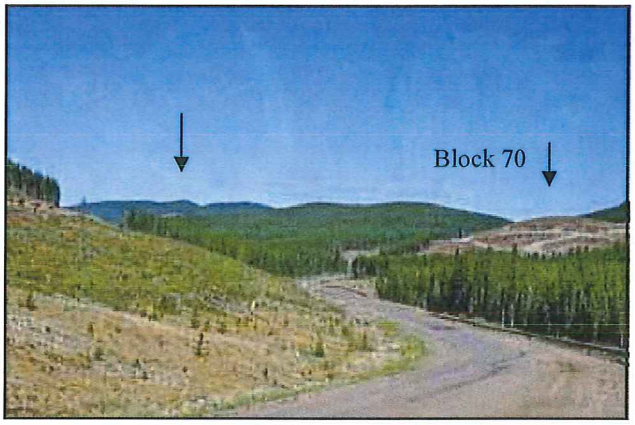
(Right) The constant jarring of the Bracke as it pounded over stumps, logs and rough ground frequently led to the herbicider losing its prime. AFS Silviculture Forester Neil Barker (later Regional Executive Director) was on site during the trial and pitched in to help reprime the pump

(Above, left and right) Photopoints 1 and 2, Block 38. The stars in the bottom picture show the locations of the photopoints in this block. Photopoint 1 is along the Lynx Creek Road at the north end of the block, Photopoint 2 on the new pipeline cutting across the block. The impacts of delayed treatment combined with the problems experienced with the Bracke herbicider led to less than full site occupancy by planted stock. Fortunately, the remaining areas were occupied by aspen and the site now supports a healthy, mixed stand of pine, white spruce and aspen.

(Below) Aerial image of Block 38, 2006, looking south. The Athabasca River valley can be seen on the right side of the image. The impacts of oil and gas exploration and development on contributing forest landbase are also evident in the image, exemplified by the wide pipeline cutting across the block at Photopoint 2.

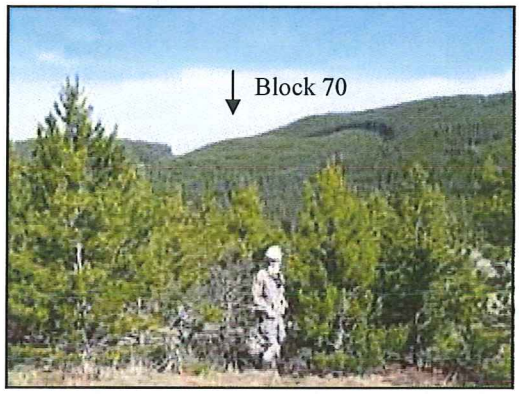


McLeod 7, Block 80
Harvested 1983
Scarified for Natural 1984
Bracke Site Preparation 1990
Planted pine 1991



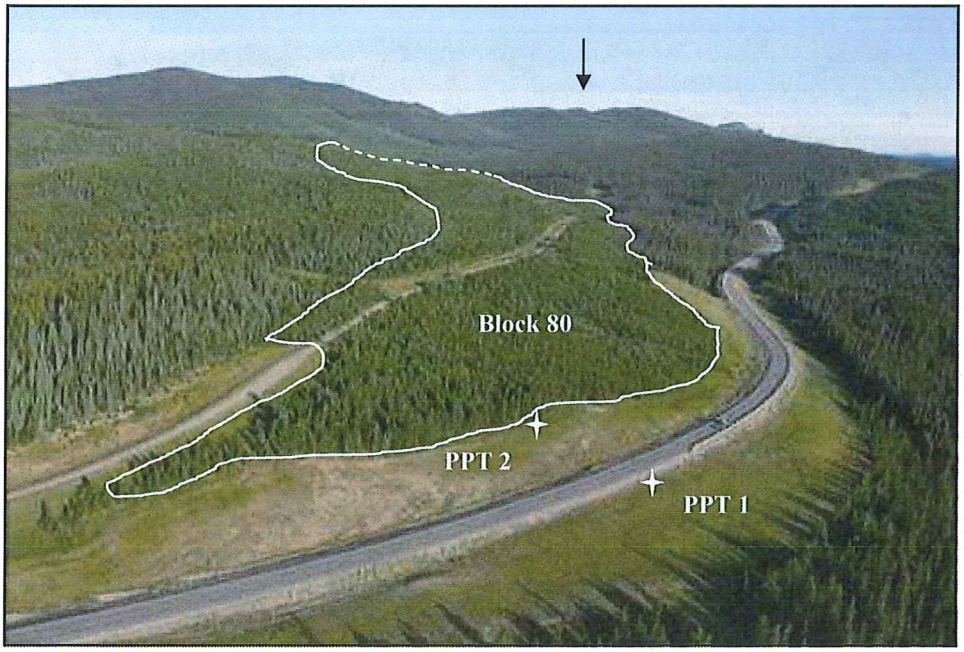
(Above, left) Block 80 just after harvest, 1983.

(Above, Right) Block 80 from Photopoint 1, 2006.
Looking northwards along Hwy 40 towards Hinton

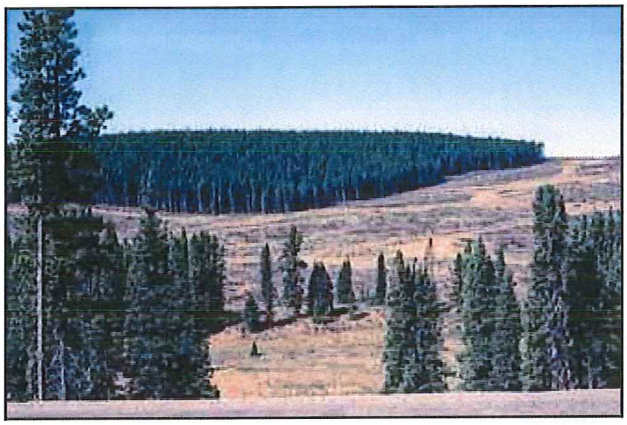


(Left) Photopoint 2 at the edge of the Hwy 40 right of way in Block 80, looking north.
Note the reforested Block 70 (arrow left & above left) in the background - also visible, freshly harvested, in the 1983 image.

(Below) Aerial view of Block 80 adjacent to Hwy 40, 2006.
Showing camera photopoints 1 and 2, approximate block boundary



McLeod 7, Block 81
Harvested 1981
Scarified for Natural 1983
Bracke Site Prep 1987
Planted - Pine 1989

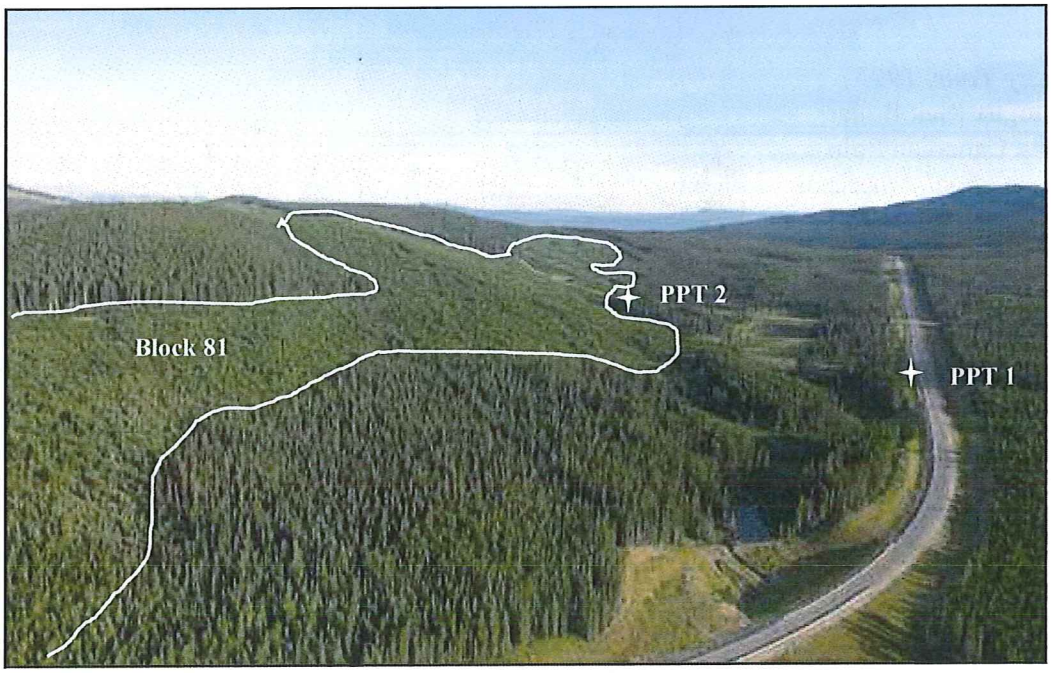


(Above, left) Block 81 view from Hwy 40, 1983

(Above, right) Photopoint 1, 2006

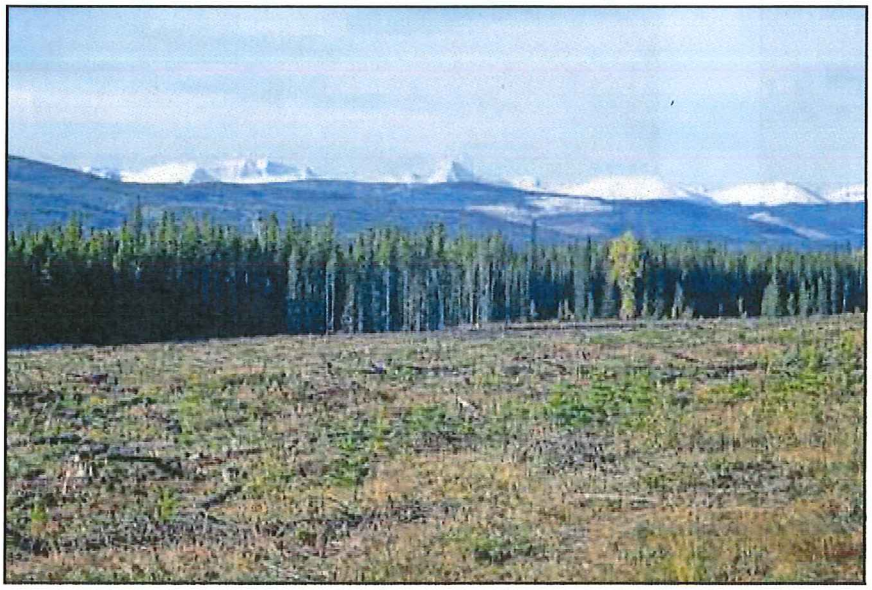
(Left) Photopoint 2, on Cold Creek Road west of Hwy 40.

(Below) 2006 aerial View of Block 81, looking north.
Block 81 lies to the West of Hwy 40, adjacent to a very popular snowmachine area known locally as "Skidoo Valley".



McLeod 7, Block 118
Harvested 1987
Scarified for Natural 1987
Planted pine 1988

The images below in 1993 (below, left) and in 1997 (bottom, right) show the early stages of development of the regeneration in the block.



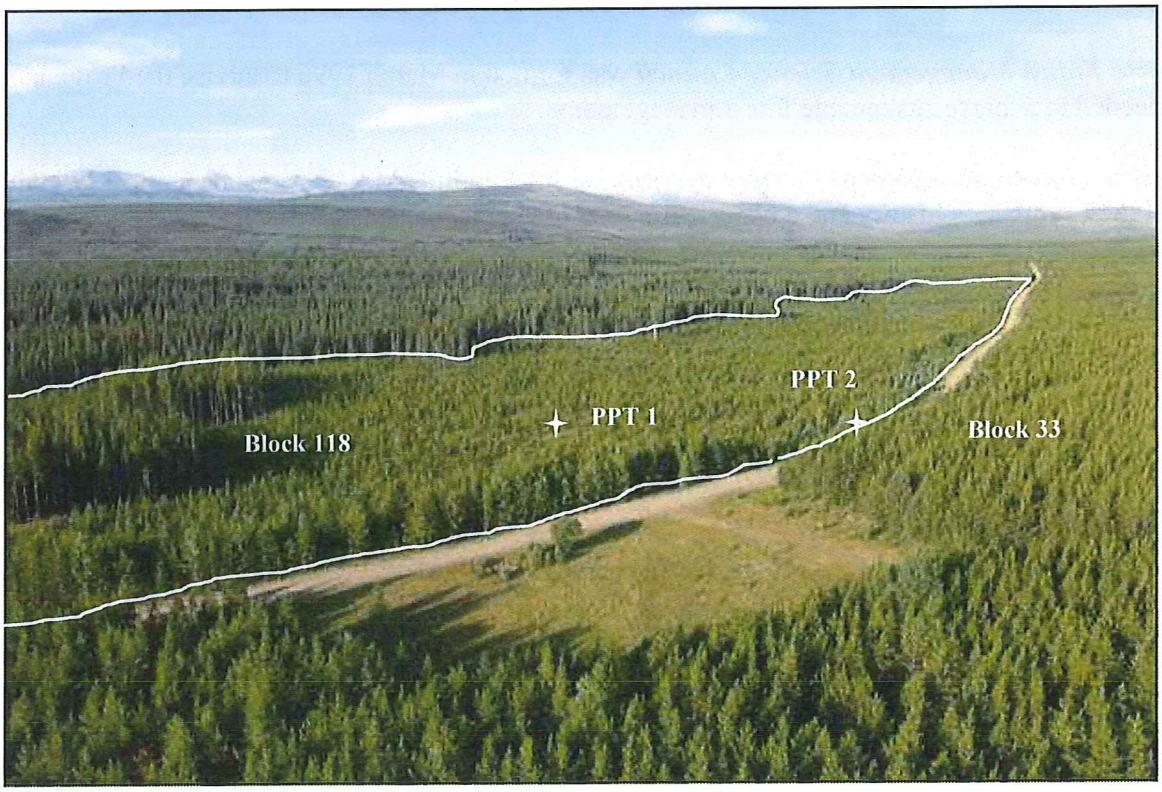
(Left) Looking across Block 118 to the west, 1993
Six years after harvest, pine regeneration is quite visible in the block

(Right) Forestry Tour, 1997
Company biologist Rick Bonar conducts a joint Canadian Pulp and Paper Association/ American Pulpwood Association tour in Block 118

(Left) Photopoint 2, 2006 with interpretive sign - 19 years after harvest

(Right) Photopoint 1, 2006 looking west
The open patches with dead trees are often a sign of Armillaria Root Rot, a common disease in pine forests. Fortunately, such damage is usually quite limited and is manifested by small clearings in otherwise fully stocked forest stands.

(Below) Blocks 33 & 118, 2006 Aerial image looking southwest.
Stars indicate photopoints, approximate block boundary shown in white.



Blocks of the 1990s

Historical Context

The expanded pulpmill began operations in 1990, and Dennis Hawksworth arrived in Hinton to begin the feasibility study, design and construction of the new HiAtha sawmill that commenced operation in 1993.

A new ***National Forest Accord*** and ***National Forest Strategy*** was approved at an Ottawa convention in 1991. The same year, the **Government of Canada** announced a ***Green Plan*** initiative to establish 10 "model forests" across Canada, with one to be chosen in each of the major forest regions, through a nation-wide competition.

In 1992, the United Nations ***Earth Summit*** agreed to pursue international accords on criteria and indicators. This was followed up by the 1994 ***Montreal Process*** that selected an set of criteria and indicators for boreal and temperate forests. The **Canadian Council of Forest Ministers** in 1995 produced a followup set of C&I for Canadian forests and in 2000 the **Canadian Model Forest Network** presented a user's guide to local level indicators for Canadian forest conditions.

The ***Forest Resource Improvement Program*** was introduced in 1994. In 1997 this fund was transferred to the Forest Resource Improvement Association of Alberta, an arms-length Designated Administrative Authority (DAO) that looks after programs formerly administered by the Province.

A multi-stakeholder task force presented the ***Alberta Forest Conservation Strategy*** report in 1997. This all-encompassing report, recommending a triad approach (environment, social, economic) approach to sustainable forest management, was followed up by the Province's response: ***The Alberta Forest Legacy - Implementation Framework for Sustainable Forest Management*** - in 1998.

In 1996, the government's Standing Committee on Natural Resources and Sustainable Development, chaired by MLA Wayne Jacques reviewed policies covering FMAs in Alberta. The subsequent ***"Jacques Report"*** included recommendations reflecting increasing government expectations for new and renewed FMAs and also proposes a form of 'evergreen' renewal negotiations at ten year intervals.

The ***Alberta Forest Management Science Council*** was formed in March 1996 to advise the Province on science needed to achieve sustainable forest management.

The ***Adaptive Forest Management/ History Program*** of the Foothills Model Forest began in 1996 with a review of the Company's history and a historic timeline of events that shaped that history.

In 1997 a joint Albert Forest Products Associaion/Provincial ***Task Force on Enhanced Forest Management*** presented Minister Ty Lund with a report and recommendations on how to incorporate enhanced forest management into the new Alberta Conservation Strategy. The report was endorsed by the Minister and the Standing Policy Committee.

The ***Yellowstone to Yukon*** (Y to Y) advocacy campaign began at a 1997 conference at Waterton Lake.

On September 19th, 1997 the Company honoured the two pioneers who set in motion the forest management program at Hinton by renaming the north and south halves of the FMA as the Loomis Forest and Crossley Forest, respectively.

In 1999, Premier Ralph Klein unveiled ***Alberta's Commitment to Sustainable Resource and Environmental Management.*** This led to some major changes in government departmental organization and structure.

Forest Policy and Planning

In 1991 the Company and the Province combined resources to develop a proposal for a Model Forest at Hinton, submitting a successful proposal to the ***Green Plan*** nation-wide competition to establish a model forest in each of Canada's major forest regions. This model forest expanded in 1995 with the addition of ***Jasper National Park***, and again in 1997 with ***Willmore Wilderness Park***. It established and maintains a national and international reputation for the quality of its science and its focus on practical research for improving sustainable forest management.

Two management plans were completed. The first, in 1991, incorporated the new FMA boundaries adjusted with the expansion projects. The second, in 1999 used extensive input from the Forest Resource Advisory Group (FRAG) to produce the first plan incorporating the Canadian Council of Forest Ministers' guiding principles for forest management and a localized set of criteria and indicators, partly arising from the Foothills Model research program.

A combined Company/ Government task force developed the ***Linked Planning Process*** to ensure compatibility between various levels of planning in forest management. Based on Prof. Gordon Baskerville's six steps to Sustainable Forest Management, it was designed to ensure compatability and consistency in all levels of planning, including a built-in feedback and control mechanism through the ***Stewardship Report.*** This Process was later reflected in various policy documents in Alberta, including the forest management planning guidelines.

The Model Forest promoted and supported the establishment of the **Foothills Growth and Yield Association** in 1999.

Ground Rules

The 1996 Ground Rules update was a remarkable step forward in ground rule development. Developed through close consultation with FRAG, a complete set of community, economic and environmental goals were developed. A new format was introduced, comprised of Goals/ Intent/ Standards/ Operating Practices. It established a strong linkage between the forest management plan and operating practices. The new goals were included in the new management plan. The Linked Planning Process set forward a new system of plans and approvals. New rules for public consultation were also provided. A **Ground Rules Standing Committee** was established, with revisions to be made as necessary, not according to some prescribed schedule. The booklet included an 18-page glossary of terms used, and the length expanded to 104 Pages

Forest Operations

As harvest levels rose, the proportion of wood harvested by contractors increased also. Woods operations became increasingly diversified with new generation sawhead fellerbunchers, cut to length processors, grapple skidders, forwarders - with a high focus on minimizing site impacts during harvest. Many haul trucks were equipped with central tire inflation to increase traction and reduce impacts on wet bush roads. The use of geographic positioning systems to map and monitor equipment movement in the woods began to prove its utility.

Silviculture

The Province introduced "Free to Grow" reforestation requirements in 1991 which added a new required survey a few years after the initial regeneration status survey, to ensure the trees were growing free of competing vegetation.

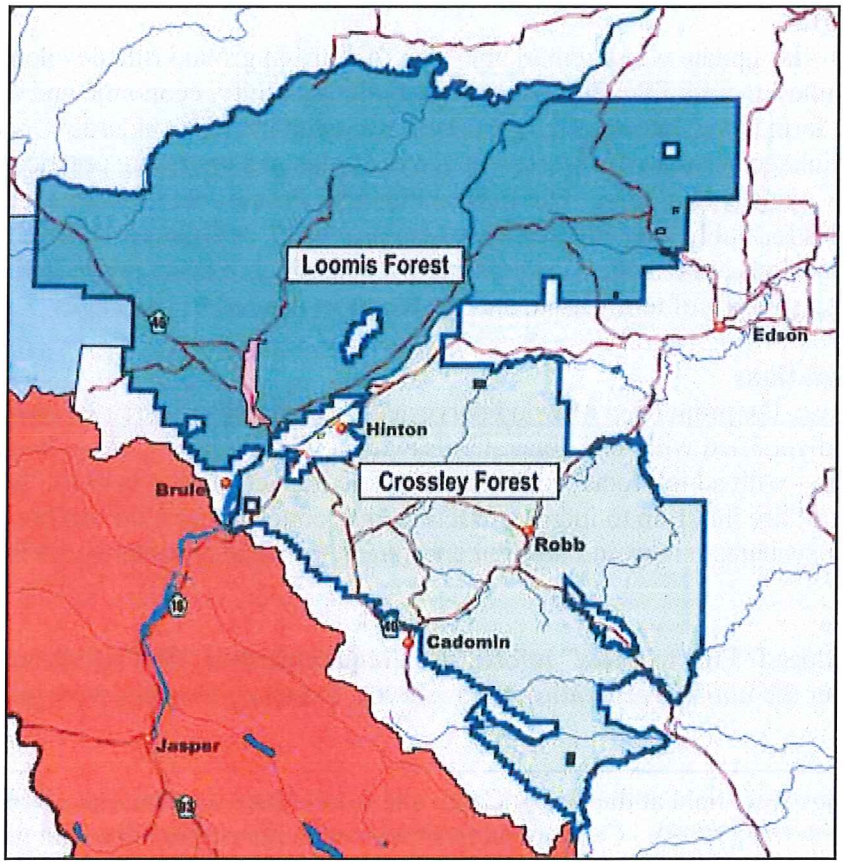
Ceremonial plantings were held at the Gregg Cabin site to celebrate the planting of the 50 millionth tree (1991) and the 100 millionth tree (1999). Ceremonial trees were also planted in Hinton in parallel ceremonies, the 50 millionth at the Hinton Training Centre and the 100 millionth in front of the Company's main administration office.

In 1993, the Province advised the industry that it would no longer provide free seedlings for reforestation, and that it would privatize the provincial tree nursery. This announcement, resisted at first by industry, stimulated the development of a vibrant private nursery industry in Alberta and much improved seedling quality and price. For the Company, it spelled the end of its own greenhouse which could no longer compete in terms of stock quality, quantity and price with the commercial seedling producers and it was closed in 1999.

Kimmins-Brace Report on Silviculture. In 1993, Dr. Hamish Kimmins and retired CFS researcher Lorne Brace conducted a review of the Company's silviculture program. This review sparked a major revamping and expansion of the silviculture program and its concentration under one manager - David Presslee. It was followed up with three further reports, each addressing elements of the Kimmins/Brace review. It also led to the development of an ecological classification system for West Central Alberta by the Foothills Model Forest, the ecological mapping of the entire FMA, and the implementation of a preharvest assessment system for all planned harvest areas.

With the implementation of the Kimmins/Brace recommendations as well as those of the three reports that followed, the quality and intensity of the silviculture program under Dave Presslee was greatly enhanced. With a more site-specific assessment of blocks both before and after harvest, the level of site preparation and planting shortly after harvest also rose, along with the use of larger stock in highly competitive sites.

The Crossley and Loomis Forests of the West Fraser Hinton FMA



Block of the 1990s—Images and Discussion

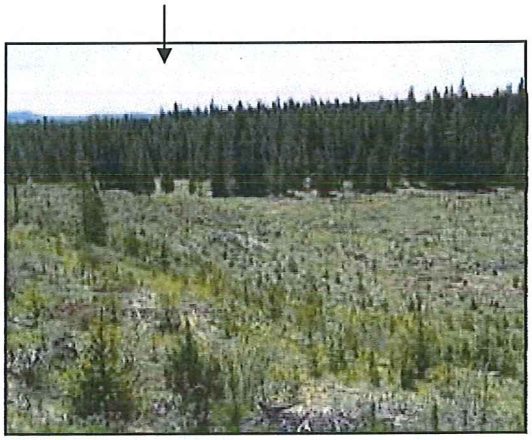
Two blocks harvested in the 1990s are added to this report as a link to the future and subsequent opportunities to identify and more completely track the development of harvested areas from harvest to treatment to subsequent transition from juvenile to pole to mature stand. Also, the ceremonial plantations that were established at the Gregg Cabin are presented here for future reference and tracking.

McLeod 5, Block 36

Harvested 1997
Scarified for Natural 1998
Planted pine 1999

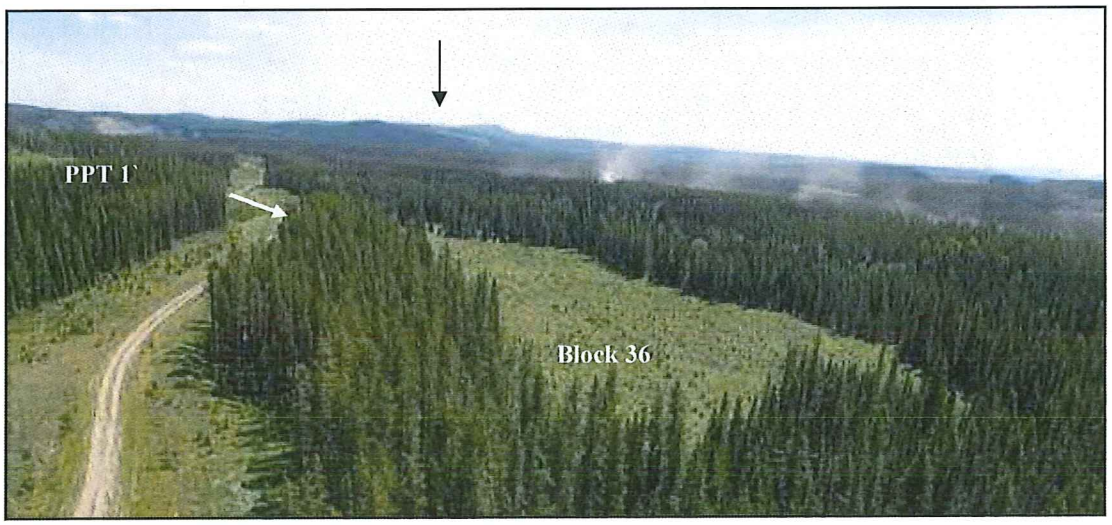
(Left) Harvesting in 1997

(Right) Same view, Photopoint 1 2006



(Left) View to the south from Photopoint 1, 2006.

(Below) Aerial view to the East, 2006. Dust is from traffic on the Robb Road.



McLeod 7, Block 2172 - Remote Chipping Operations
Harvested 1994
Scarified for Natural 1998

From the late 80s until the early 2000s, a portable bush chipping operation operated on the FMA. Designed to take advantage of overstocked mature stands with low stem merchantability but high total volume - similar to those stands formerly targeted by fence post operations - it was able to substantially increase net volume per hectare recoverable from these sites.

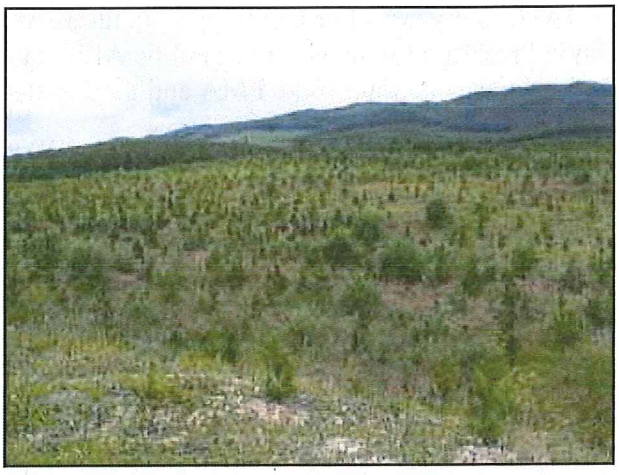
(Left) Bush Chipping in Block 2172, 1994.
Rice Logging Operations

The chipper took tree length stems, partially debranched and chipped them while separating bark, needles and fines with a blower system. The chips were then blown directly into specially designed chip trucks for transport to the mill.

The residue was then redistributed across the block with a machine custom designed using the same principles as an agricultural manure spreader. Carthur Rice, the owner of Rice Logging, was a former prairie farmer, and used expertise from that career in many aspects of his new one. Initial concerns that chipper residue might negatively impact seedling establishment and growth proved untrue. Indeed, the residue appeared to contribute some nutrient benefits to the young trees.

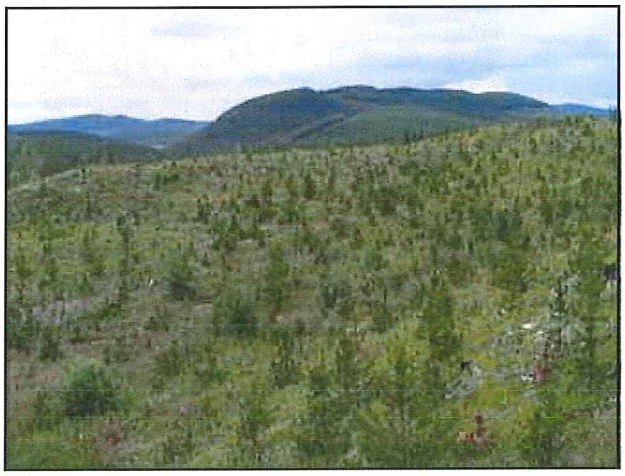
(Below) View of the chipping operation from the air, 1994.

(Left) Grapple skidder with high flotation tires moving trees to chipper, 1994.



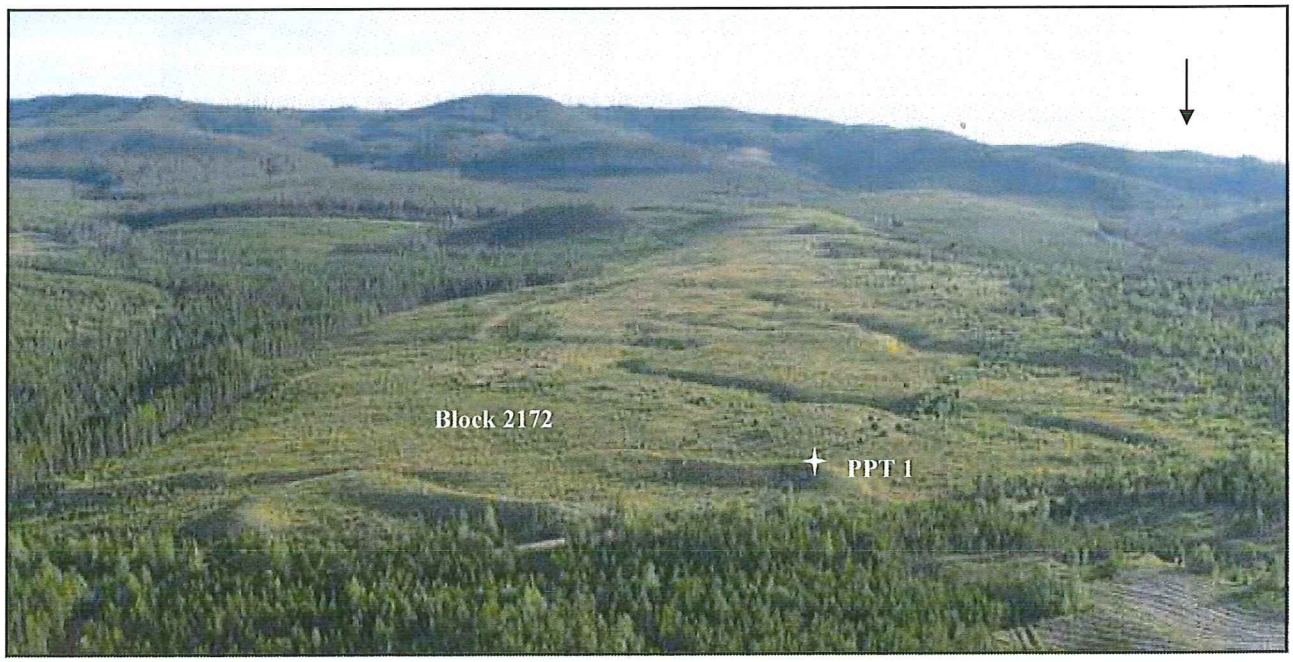
(Right) Photopoint 1, Block 2172 in 2006.
This image faces north towards the Bighorn Ridge. 12 years after harvest, abundant pine regeneration is filling in the block.

(Below) View to the West from Photopoint 1



(Below) Aerial view of Block 2172 from South to North, 2006.

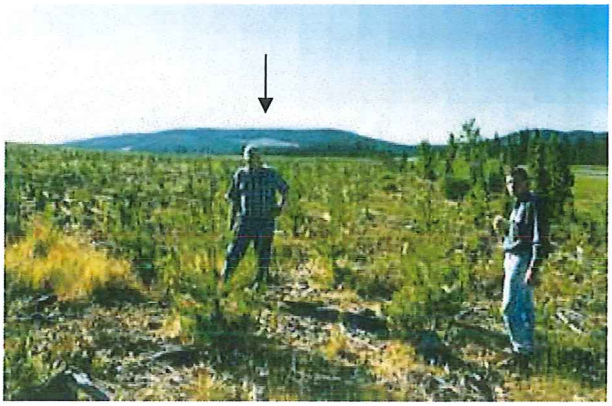
Note two eskers at bottom of image, Photopoint 1 (white star) is atop the esker centre right



Berland 4 Block 230
Harvested 1992
Bracke Site Preparation 1993
Planted 1994

(Right) David Presslee and Aaron Jones in Block 230, 1998 at Photopoint 1

In 1998, four years after planting, Silviculture Manager David Presslee took newly-hired Public Affairs Forester Aaron Jones on a tour of the FMA and they visited this block.

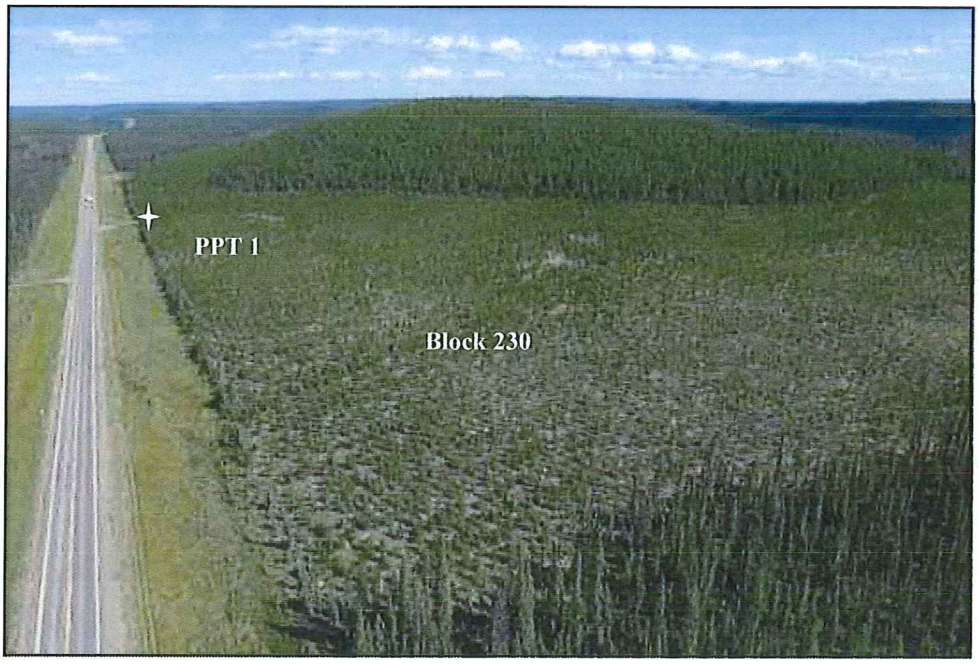


(Below) Author and pilot Robert Kastner at Photopoint 1

(Below) Interpretive sign at Block 230, 2006

Brian Carnell, who took many of the aerial pictures in this report once worked as a silviculture contractor for the Company, and planted this block. He stands beside the interpretive sign at Photopoint 1, Hwy 40.

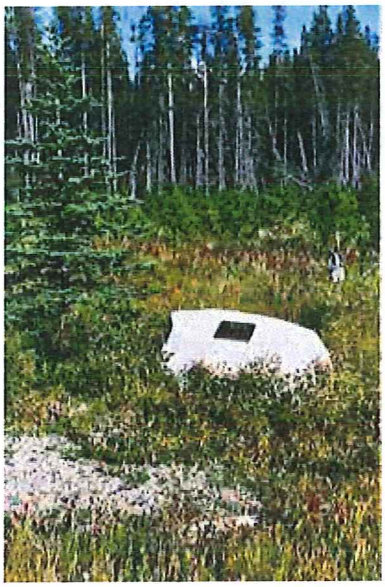
(Below) Aerial View looking north along Hwy 40, 2006



Ceremonial Plantations: The 50 Millionth Tree

Plantations were established adjacent to the Gregg Cabin in 1991 (50 millionth tree) and 1999 (100 millionth tree) and 2005 (150 millionth tree). On each occasion, Forest Resources employees and their families were invited to the celebration and the children helped plant the small blocks prepared for each plantation.

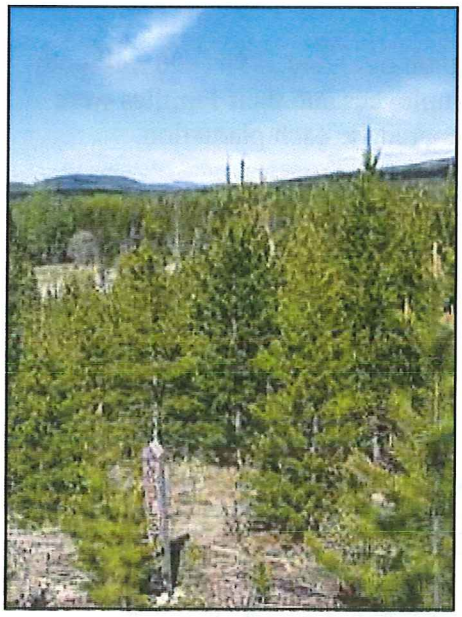
(Left) Company supervisor Terry Nilson wearing his commemorative t shirt supervises a young planter.



(Below and Right) 50 millionth plantation and commemorative tree and plaque, 1997

(Right) Planting Ceremony at Hinton Training Centre, 1991

Company President Tom Buell (l), MLA and Minister of Highways Peter Trynchy (m) and Forest Resources Manager Don Laishley (r) are assisted by a Junior Forest Warden as they plant a second 50 millionth tree and unveil a similar plaque at the Hinton Training Centre.



(Left) 50 million tree Photopoint 1, 2006. The Rolston Memorial. Ken Rolston, former head of the American Pulpwood Association, wished his ashes to be spread on an renowned industrial forest and in 1997 members of the CPPA and the APA held a ceremony in the 50 millionth tree plantation to comply with his wishes.

(Right) Photopoint 2 2006
Adjacent to the Tri Creeks road. Growth in the 15 years since establishment has been remarkable.

(Right) Photopoint 3, 2006
The 50 millionth tree - spruce tree on left - the commemorative plaque and sign.

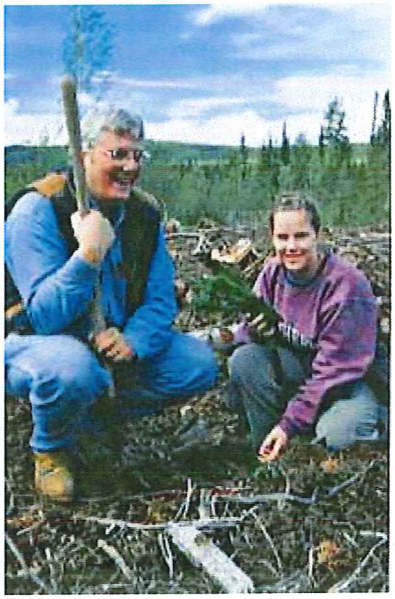
(Below) Looking south at the ceremonial plantations, 2006.
The plantations are outlined in white, the Gregg Cabin Recreation Area is on the right side of the image. The large log picnic shelter was built by the Company as a permanent legacy of the 100 millionth tree planting.

Blocks of the 1990s

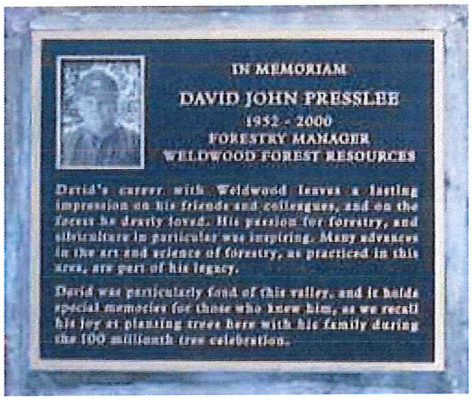
The 100 millionth tree plantation - June 1999

(Left) Planting Ceremony
MLA Ivan Strang, Associate Minister of Forestry Mike Cardinal, VP Dennis Hawksworth, ADM Cliff Henderson, CFS Director General Boyd Case and Sr VP Sandy Gray assisted by employee Larry Stordock's daughter Casey unveil 100 millionth tree plaque at Gregg Cabin site.

(Right) David and Keri Presslee



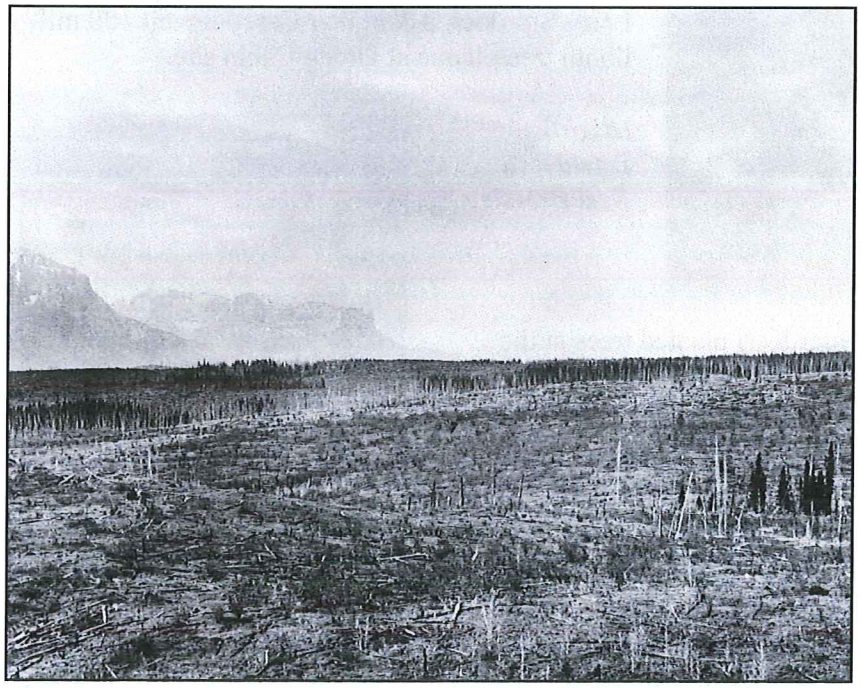
Planning Manager Dave Presslee and daughter Keri planted trees at the ceremony. The Gregg Cabin site, its historic significance and its memorial plantations were dear to the heart of Dave Presslee. He passed away in January 2000 and his contribution was recognized with a special plaque at this site.



(Below) Photopoint 1, the 100 Millionth tree site - 2006.

Landscape Convergence

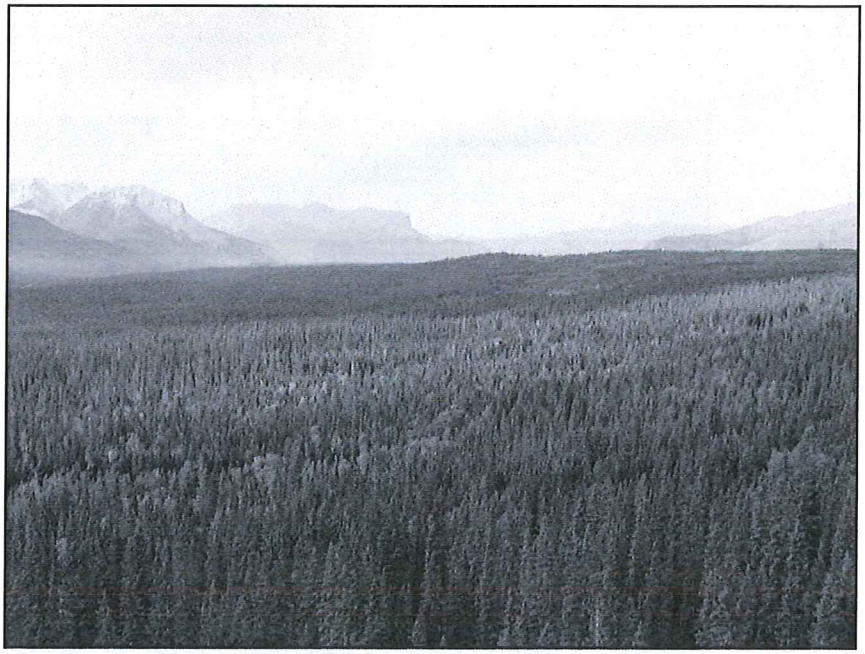
Early visitors to the upper Athabasca region saw a landscape profoundly impacted by fire. Various journals talked about the devastation wrought by successive forest fires, some of natural origin and others from aboriginal burning. Early records from the Canadian Forestry Branch talked about the tremendous waste of potentially valuable timber stands and the impacts of fire on soil stability and water quality downstream.



(Left) Landscape west of Maskuta Creek, 1911. Dominion Forestry Branch (DFB) photo

The 1911 DFB image at left, from just west of Maskuta Creek (Formerly Prairie Creek) exemplifies the fire-ravaged landscapes that dominated the Eastern Slopes of Alberta. These were observed and recorded by early CFB rangers. Note the lack of standing live timber and the amount of dead material on the ground.

(Right) Landscape west of Maskuta Creek, 2006



This picture has changed dramatically in the intervening years as decades of fire protection and - more recently - forest management have provided the conditions that allowed young seedlings to survive and grow to the mature stands we see today.
Repeat Photography image, 2006.

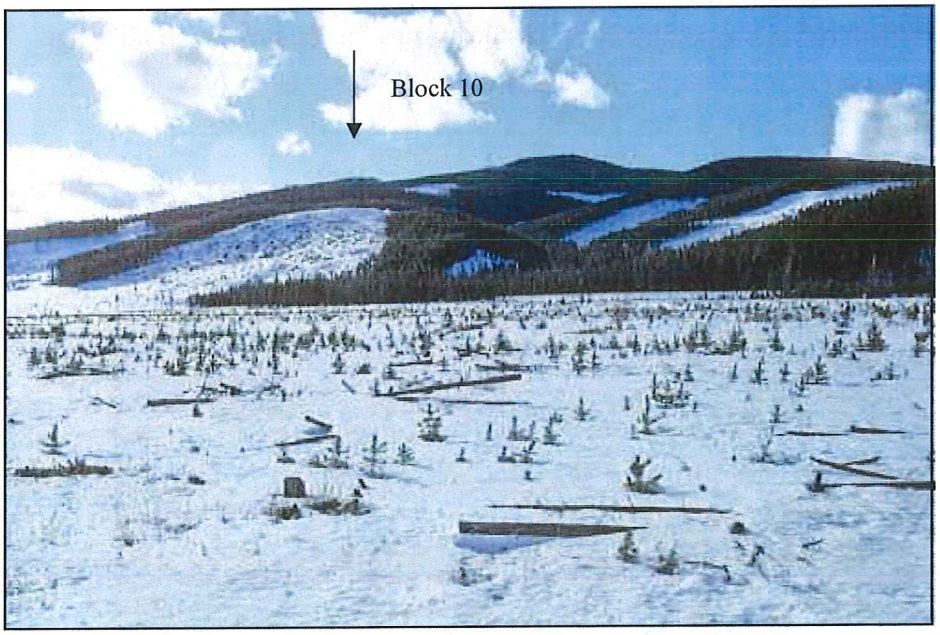
The images on the preceding pages show how the landscape evolves over time following fire and renewal. A similar process occurs following harvest and renewal although each disturbance leaves sites in a distinctly different state at the outset. Over time, however, the structure and composition of these post-disturbance sites become similar. The time period for this convergence varies according to the forest type and the nature and severity of the disturbance. In lodgepole pine, for example, stands originating from fire and those originating from reforestation typically reach convergence in 30 to 50 years, and some are seen in this report.

In the early days of operations on the Hinton Forest, a two pass harvest system was used with second pass renewal within 10 years following successful reforestation. Although these adjacent regenerated stands originated from similar treatments, they too followed individual paths until the differences between them became blurred and it was difficult to see where one began and the other left off. In the case of the less than 10 year first/second pass system, this convergence came sooner than that which occurred after the two metre rule was invoked. Later pressure to increase the return rule to three metres would have prolonged this convergence by several more years. In this report, we will visit some of those landscapes where this convergence has occurred.

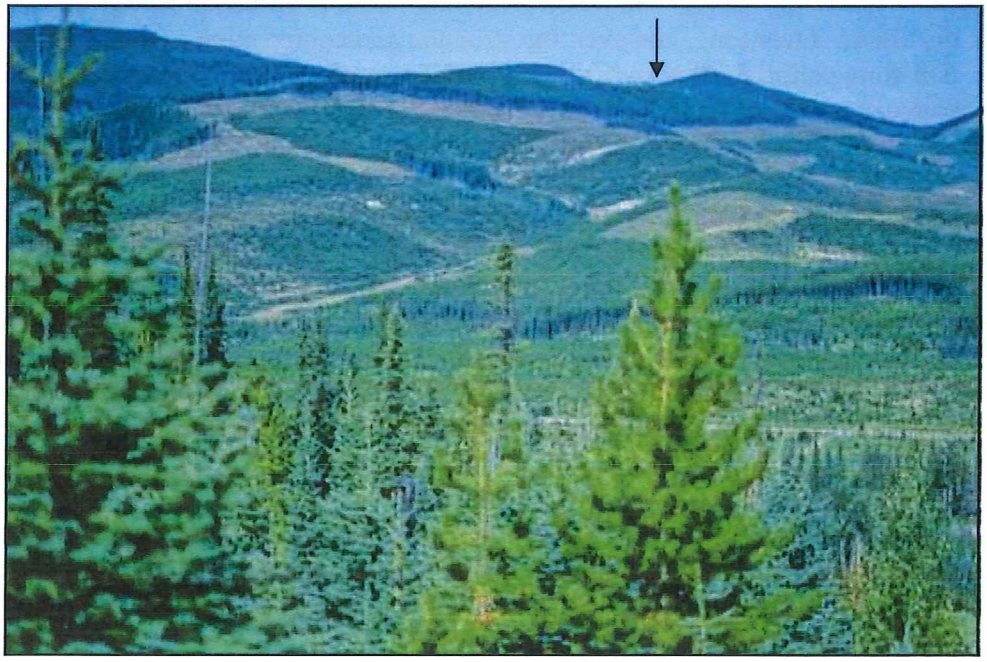
Former Head of Silviculture for the Province, Steve Ferdinand, told the author that in his view it would have been preferable to stay with the original 10 year rule, because the blending of first and second pass reforestation would have happened much sooner thus softening much of the public criticism over the appearance of the alternate patch clearcutting system.

Current movement back towards larger cuts in the first pass, but with a focus on approximating the patterns and residual stems and patches left by fires are an improvement over the traditional two pass system with its straight line borders and complete removal of all merchantable material within the blocks treated.

The first series of images show the hillside just west of Hwy 40 in McLeod 2 - the same hillside where blocks 10 and 27 in this report are found.

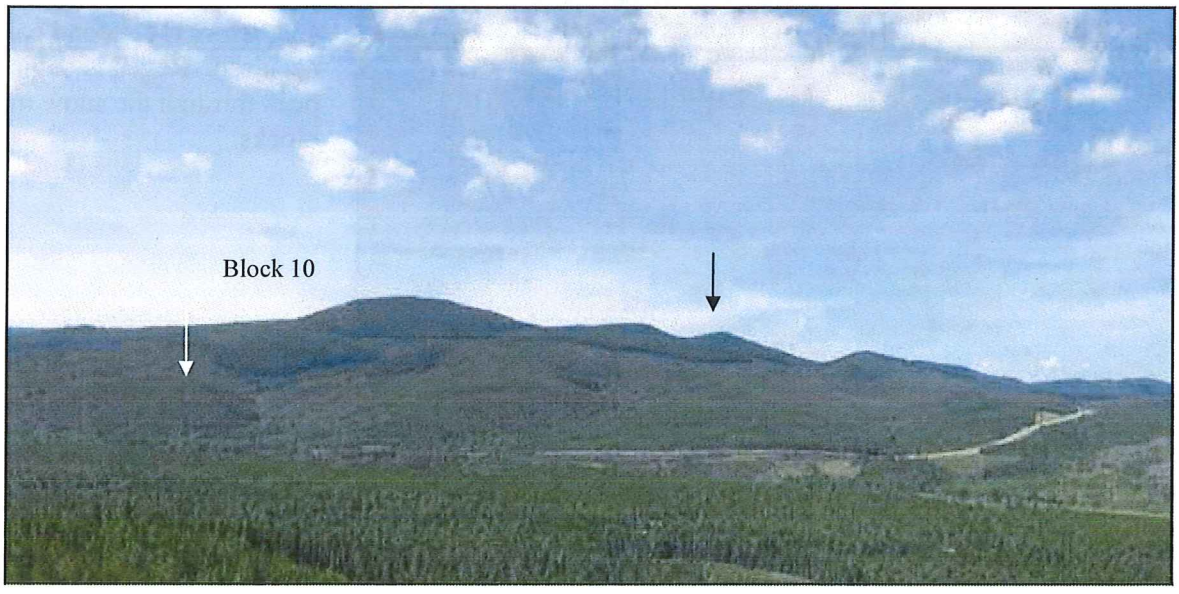


The image at left shows the Hwy 40 hillside in the background. It was taken in 1972, about 10 years after the first pass cuts, and before the second pass cuts occurred. Regen is beginning to peek through the snow in these blocks.



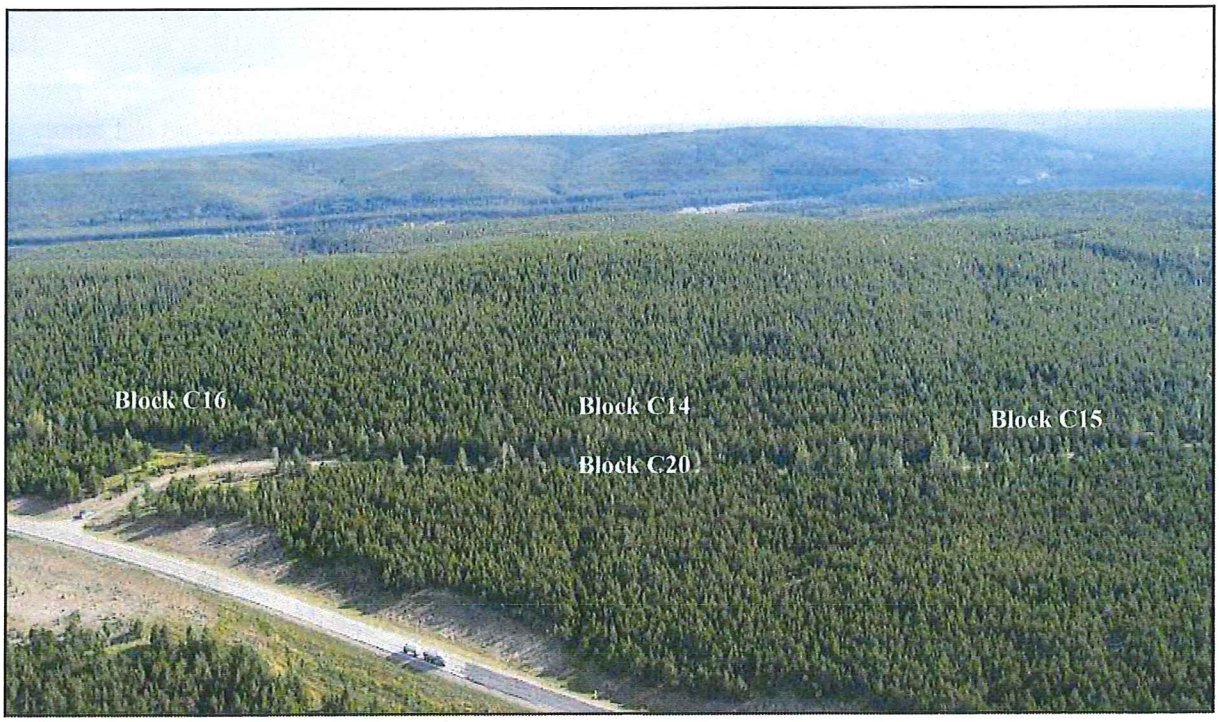
Several years later, in 1981 (above), the regeneration in the first pass blocks is quite pronounced but the regeneration in the second pass blocks is also beginning to be evident. This is about 20 years after first pass harvest.

Some time has elapsed since the 1972 and 1981 images were taken. As we look at this hillside in 2006 (below) there is no visual evidence of the first/second pass pattern and indeed one would not realize that harvest had occurred were it not for the distinct line of inaccessibility at the top of the slopes and the uncut original stands above it. Note the common reference points shown by the arrows for the images on this page and the one preceding it.

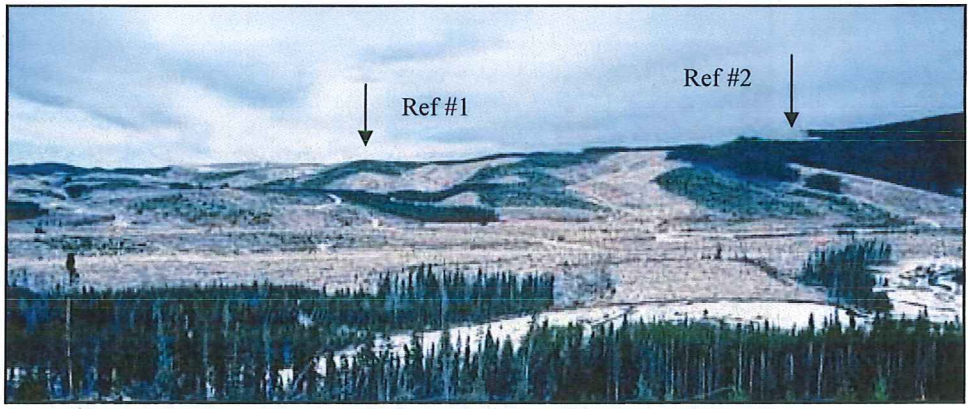


In the early 80s, a scarification cat works on a block in Berland 3. In the background are earlier harvests now regenerated along with a patchwork of more recent harvests.

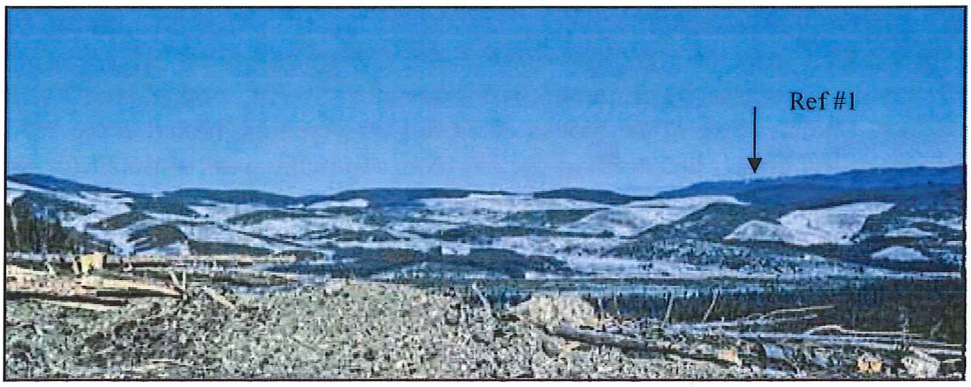
Twenty five years later, the viewscape in this Compartment has achieved convergence. Below are reforested first and second pass blocks from the 1960s and early 70s, east of Hwy 40 along the old "Lower Road" to Grande Cache. Two of the blocks - C14 & C20 were highlighted in the 1971 STOP report and are in the centre of the image, just north of the old road. In many parts of the FMA, the distinctions between first and second pass harvests have blurred and largely disappeared. For instance, travelers driving along Hwy 40 south of the Berland River do not realize that most of the pine stands they are passing through are not the "natural" forests they think they are. In fact, they are regenerated cutovers from first and second pass logging, but they are providing the same ecological services as those of fire origin stands at a similar stage of development.



Further down the Gregg River Valley from the images on page 88, a different pattern is emerging - the legacy of the 1997 "Christmas Fire". Here, early and later photos show a landscape where first and second pass blocks are beginning to merge. Below are two images, the first from 1977, the second from the mid-80s showing first pass blocks cut around 1961. The green reforestation from the first pass cuts is quite evident, while the second pass blocks, cut between 1968 and 1976 beginning to peek through the snow in the bottom image .

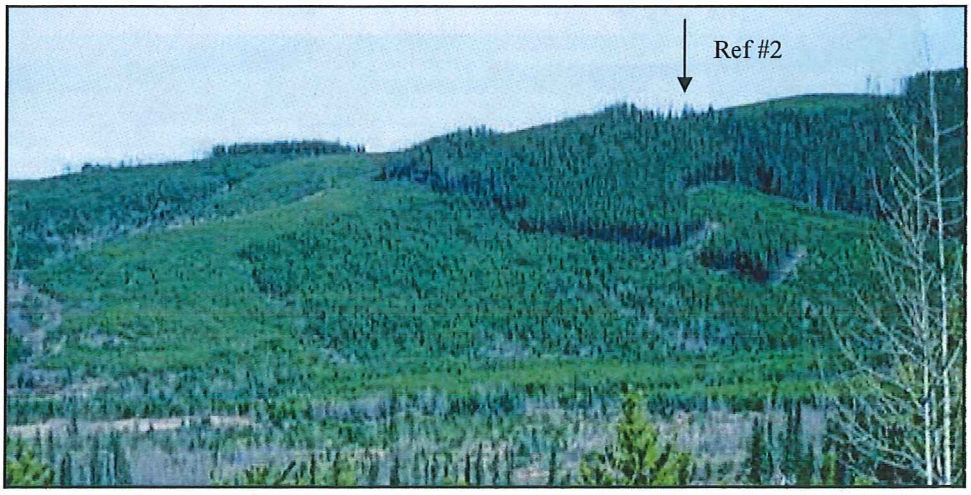


(Right) Gregg Valley looking north, 1977



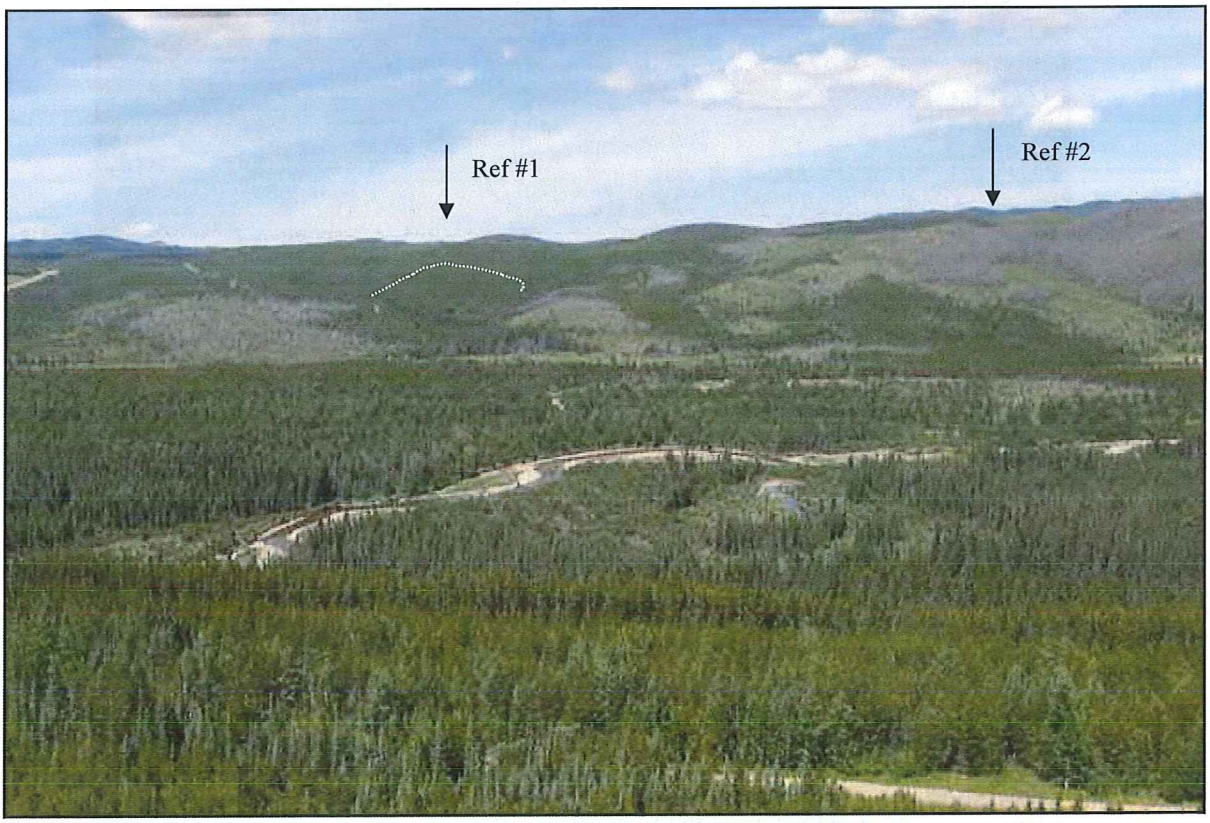
(Right) Gregg Valley looking north, mid-80s

18 years after the top picture, a 1995 image from a similar perspective shows the gradual - but not quite complete convergence of the first and second pass stands along the north side of the Gregg River. This was about to change.



(Right) Gregg Valley looking north, 1995

The 1997 "Christmas fire" that burned 3000 ha along the Gregg River consumed both regenerated stands and fire origin stands as it skipped across the landscape driven by gale-force Chinook winds. In the image below the reforestation that was well established on Block 71 on the hillside below and to the right of the arrow (planted by the author in 1967) has been destroyed by the fire. Natural reforestation is occurring from cones in the pine trees in the fire origin stands, but most of the regenerated stands were too young to have cones and many have since been replanted. Meanwhile, other stands from the previous pages escaped the fire and are reaching convergence.



Today, the patterns of harvest are changing with variable block sizes and shapes patterned after the landscape following fire events. This includes the maintenance of structure within the harvest blocks through the retention of individual trees as well as patches of trees, such as the view below, west of the Wildhay River.

East and south of the above image, harvest operations are mostly completed in Athabasca 13. Near the 1966 bomb site, a view across first and second pass harvests towards the mountains shows little interruption of the forest canopy except the evidence of oil and gas exploration and development which is having a significant impact on the landscape in the Loomis Forest north of Hinton.

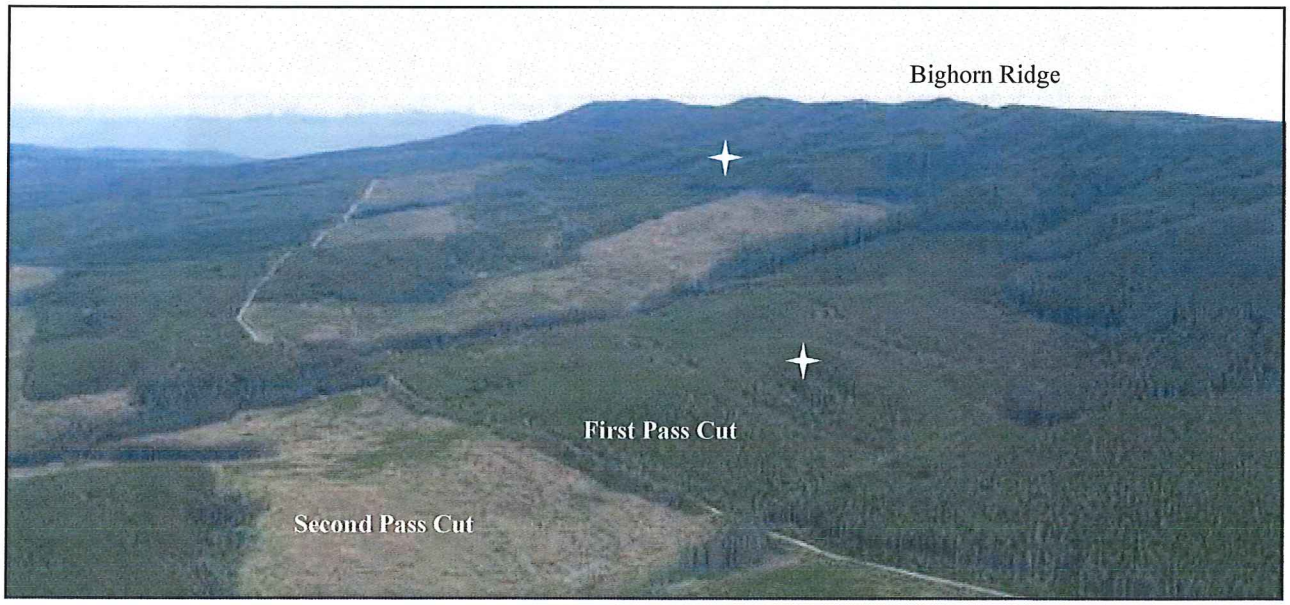
Some 2006 images from the Berland progressive clear cut show a continuous canopy of young forest blanketing the landscape. Had these cuts from the late 1970s been done using the conventional two - pass system of the time, this landscape would look much different today, with the alternate cuts just beginning to blend together. Many people would find them aesthetically unpleasant.

The views to the east (above) and west (below) are visually pleasing by any standard. Dominated by pine, other species such as white spruce and aspen are also present. The original stands were predominantly lodgepole pine monocultures, very old and with high levels of standing dead trees.

The process of harvest and renewal continues today. First pass cuts are treated to establish new stands of trees and when they have reached the appropriate stage of development the second pass can be removed. The period between these two events will be a large influence on when landscape convergence can be achieved. The images below show the two stages of harvest and renewal looking to the northwest along the side of the Bighorn Ridge in McLeod 7.

(Below) First Pass Harvesting, 1976

Thirty years later in 2006 (below) the first pass cuts seen above are fully regenerated, the second pass harvest has been completed and reforestation is evident on these cuts also. In a few years, the boundaries between these passes will be indistinguishable. Stars in the blocks are common reference points.



Conclusion

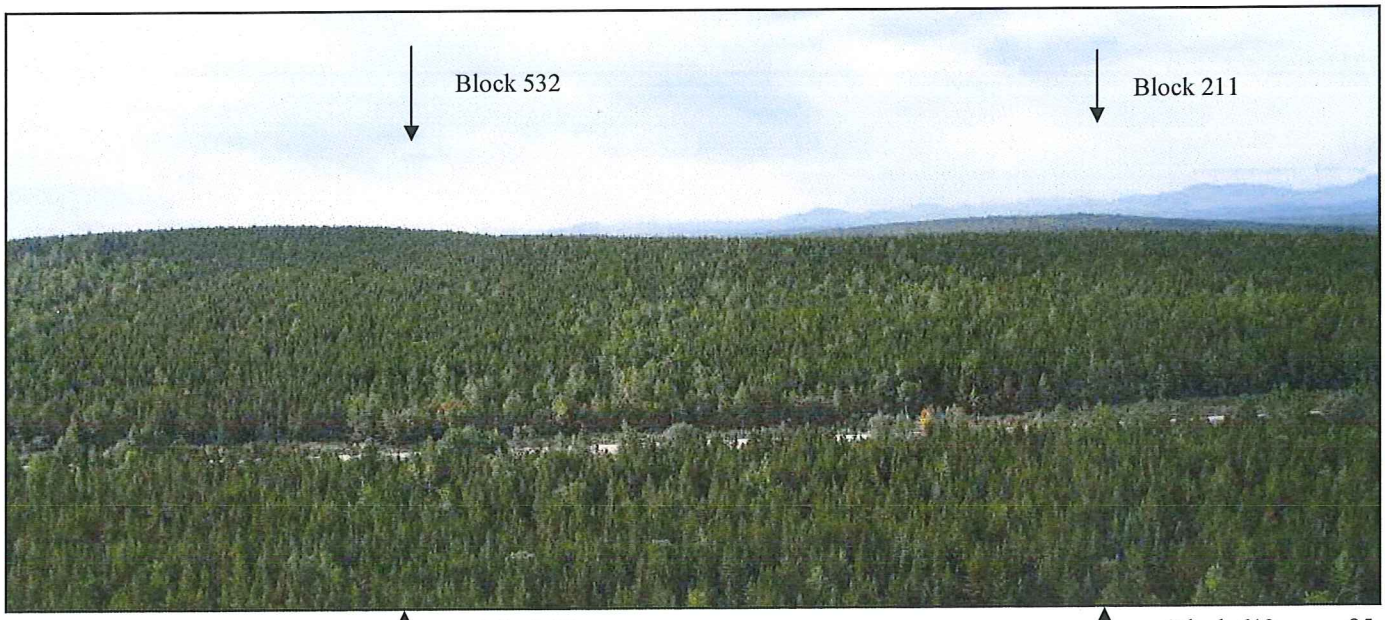
West Fraser's Hinton forests have been under active forest management for over 50 years, during which time the Company has been the embodiment of adaptive forest management. Des Crossley and his successors have tried to attract the brightest and best to their cadre of foresters, to seek out and incorporate the best applied science to their forest stewardship ethic. They were guided by three fundamental principles: prompt regeneration of harvested areas, distribution of harvest over the entire area to maintain a constant haul distance (and therefore cost) over the rotation, and the incorporation of a multiple use philosophy. These principles are still sustained, suitably augmented to reflect the growing body of knowledge around sustainable forest management.

The number of "firsts" attributed to the Hinton operation are too many to list. This exemplary and resilient program has drawn the attention of opinion leaders across Canada and internationally whether it be from the fields of science, forest policy, environment, communications or advocacy. It has been cited in numerous publications and policy reports, but has also been - and continues to be - the target of ENGO campaigns. Compelling evidence exemplified by the young forests now growing on past cutovers, and the biodiversity thriving within them shown the error of these past campaigns, but it has done little to dilute the enthusiasm of new ones. We hope that this modest reprise of past operations, the historic context within which they were conducted, the dedicated and professional people behind the history and the legacy they have passed down will put these continuing attacks on the West Fraser Hinton operation into perspective.

Working on this project for the past year has been a great opportunity for me to retrace many of my former paths through the Hinton forest and reflect on the many fine people I have worked on over the years. The legacy is strong and we have confidence it will be sustained by succeeding generations of foresters who don the mantle of responsibility for these two great Forests - the Crossley and Loomis Forests, named in honour of two of Alberta's distinguished pioneers in sustainable forest management..

Under the heading "a picture is worth a thousand words" we reflect on Mr. Zimmer's assertion from his 1971 STOP report and revisit an earlier image from this report: *This picture has been purposely chosen as the last picture since it very well represents the forest of the future in Alberta if we continue with present regulations under which the "pulp mill" is allowed to operate. What we are looking at is an area bald from horizon to horizon, there is not very much forest environment left".* Mr. Zimmer was describing Block 532, McLeod 6.

Below: A 2006 view of Blocks 83, 211, 532 & 612 - McLeod 6



West Fraser Photo Retrospective Project 2006
Appendix 1
Photo Points and Silvicultural History Summary of Photo Record[1]

W.C/ Compt	Block	Year Cut	Photopoints		Photo Perspective	Silvicultural History		Comments
Athabasca 5 (formerly 12)	36	1966	1	N 53 22.444 W 117 48.047	From top of hill in block 36, shooting westerly	1967 1968/69	Scarified for Natural Planted Pl	 Planted with Ontario Tubes
			2	N 53 22.603 W 117 48.061	From viewpoint on second bench, westerly			
			3	N 53 22.582 W 117 48.400	First bench at horse pasture gate			
	Helicopter Perspective		Several perspectives are provided – H1 - a long shot from south of the river H2 - the whole block taken from the south side H3, H4 two more shooting towards the mountains a H5 - from the north side of the block shooting towards McLeod 1, with the Brule horse pasture in the foreground.					
Athabasca 13	107a	1966	1	N 53 31.721 W 117 44.028	Stand Interior shooting SW	1966 1967	Bomb blast Scarified for Natural	Experimental thinning and 50 tons TNT blast by DND
			2	N 53 31.736 W 117 44.004	From N. side of access road, shooting SW			
	Helicopter Perspective		H1 – from the south shooting north – the small meadow is the SW corner; H2 - from above the block showing two areas of scattered regen, the centre one is suspected to be the blast site; H3 - from the SE shooting NW putting the block in perspective of the landscape.					
	773	1980	1	N 53 32.639 W 117 42.897	From old Chalet Site shooting to W	1984 1984	Bracke SIP Planted PlSw	Extraction Roads designed for final use as Ski Trail
	Helicopter Perspective		H1 - from just above and east of the chalet site and trail (both visible in bottom of picture) shooting to the west across 773 towards block 203; H2 - from the west looking back towards the chalet site (visible) with the ski trial going up the hill; H3 - from below the in block 773, shooting up towards the chalet site. Infestation affecting the tops of spruce trees is					

[1] Note – All of the "Zimmer Blocks" are listed, but not all are included in this report. A full report on the Zimmer project is under development by the Foothills Model Forest.

			visible in picture.					
Athabasca 14	619	1972	1	N 53 33.277 W 117 39.374	Shooting N from Seismic	1973	Bladed Planted PlSw	Across Road from 793
	Helicopter Perspective		H1 - From NE of block, shooting SW. Bladed rows clearly visible, also block 793 across the road.					
	625	1972	1	N 53 34.032 W 117 38.446	Shooting NW from old Road	1973	Bladed Planted Pl	Deep Duff treatment at the time was blade and plant
	Helicopter Perspective		H1 - Shooting down the block from the SE, shooting SW. Old road in foreground, ground photo point is just E of Barbara Creek along road. Barbara Creek flows thru centre of block.					
	793	1982	1	N 53 33.244 W 117 39.298	Shooting NE from access trail	1984 1985	Craig Simpson Ripper Plough Planted Pl	
	Helicopter Perspective		H1 - From N side of block, shooting S towards town. Block 619 is across road.					
Marlboro 7	2	1958	1	N 53 46.630 W 116 40.355	From Wellsite, shooting westerly	1959 1977 1978	Scarified for Natural Mechanical Thinning Juvenile Spacing	92% Stocked at first survey (1964) Kershaw Klearway leaving 2m strips. Intervening strips were manually spaced
			2	N 53 46.669 W 116 40.406	Stand Interior			
	Helicopter Perspective		H1 is from south of Emerson Ck Rd, shooting north – meadow is on west boundary of block 2; H2 is from east of the wellsite, shooting westerly across the wellsite into Block 2 – ground photopoints were on and near this wellsite; H3 is just north of the wellsite, shooting southwesterly into the block. Klearway strips have largely disappeared.					
Marlboro 11	38	1982	1	N 53 53.027 W 117 05.721	Shooting SE from N end of Block on Rd	1984 1985 1986 1992 2000	Scarified for Natural Bracke Herbicider SIP Planted PlSw Manual brushing Manual brushing/ girdling	Test site for use of herbicides in vegetation control
			2	N 53 52.835 W 117 05.780	From pipeline, shooting northerly			

Marlboro 11 Cont'd	Helicopter Perspective		H1- From NE of block, shooting SW. Lynx Creek Road is on right of photo, new pipeline crosses block in mid-frame.					
Embarras 3	1	1960	1	N 53 16.209 W 116 37.375	Taken along the access road near the seismic line crossing.	1961 1981	Scarified for Natural Juvenile Spacing	
	Helicopter Perspective		H1 is from the W side of the Sundance mainline shooting East. H2 is shooting SE into the block showing Sundance mainline as well as access road running SE.					
McLeod 1	51Y	1962	1 2	N 53 20.114 W 117 43.754 N 53 20.098 W 117 43.704	Stand interior, SW of road shooting N From road, shooting NE	1963 1968 1970	Scarified for Natural Fertilized Planted Pl	Experimental Fertilization 27-27-0 All pine plantations at Camp 1 were failures
	Helicopter Perspective		H1 - From SE of access road, shooting NW IMAGE NEEDS TO BE RESHOT, APPEARS TO BE THE WRONG BLOCK					
	168Y	1962	1	N 53 15.149 W 117 50.185 N 53 15.042 W 117 50.032	Along trail from random campsite in old stand, shooting NW Just off access trail along S side of block, shooting NW	1963 1969	Scarified for Natural Planted	With Ontario Tubes
	Helicopter Perspective		H1 is from south of block shooting NW into block, uncut residual with random campsite to left of block. H2 is same view/direction but longer perspective; block 911 in foreground.					
McLeod 2	10	1960	1	N 53 12.875 W 117 29.815	Along old access rd shooting NW	1962 1977	Scarified for Natural Juvenile Spacing	
	Helicopter Perspective		H1 - Just above and west of Hwy 40, shooting south across the block towards the south.					
	16	1960	1	N 53 12.823 W 117 29.436	Along Gregg R Road	1961 1977	Scarified for Natural Juvenile Spacing	First regenerated block thinned on FMA
	Helicopter Perspective		H1 – paralleling Gregg R Road, shooting SW along block; H2 – mid block, shooting SW; H3 – from above Hwy 40 shooting S.					

McLeod 2	27	1961	1	N 53 13.411 W 117 29.441	At edge of Hwy 40 R/way	1962 1977	Scarified for Natural Juvenile Spacing	
			2	N 53 13.421 W 117 29.420	Shooting S along Hwy 40 from across Hwy			
	Helicopter Perspective		H1 – shooting NW across 1997 burn. Block is across Hwy, starting at S end of burn up to about middle of burn along Hwy H2 – Shooting W across burn – older stand abutting N edge of block 27 is more visible. H3 – same perspective, closer view – old NWPP interpretive sign visible in bottom left of image					
	509	1968	1	N 53 12.643 W 117 29.764	Shooting S from Gregg R Road and Hwy 40 jct.	1969 1974 1979	Scarified for Nat Planted Planted	Much of this block was erased by Hwy 40
	Helicopter Perspective		From above Hwy 40, shooting South					
	570	1975	1	N 53 10.888 W 117 30.717	Shooting northerly from Gr pit	1976 1981	Scarified for Natural Bracke SIP and Plant	Demo Block for 1981 Greenhouse Opening
	Helicopter Perspective		H1 – Just above road junction, shooting WSW, block is on right side of road H2 – from above block 570 shooting WSW lengthwise along block. "notch" seen in ground shots is visible in top right corner of image					
	50M	1990	1	N 53 14.580 W 117 23.183	Rolston Memorial			
			2	N 53 14.586 W 117 23.269	From Tri Crk Road	1990 1991	Mounded Planted	Ceremonial Plantation
			3	N 53 14.611 W 117 23.242	50 MMth Tree			
	Helicopter Perspective		All three plantations, and the Gregg Cabin rec site can be seen from an image taken just to the north, shooting south.					
	100M	1998	1	N 53 14.644 W 117 23.230	100 MMth Tree	1998 1999	Mounded Planted	Ceremonial Plantation
	150M	2005	1	N 53 14.631 W 117 23.209	150 MMth Tree	2005	Mounded/ Planted	Ceremonial Plantation
	Gregg Burn 1	1956	1	N 53 13.589 W 117 21.081	Beside Tri Creeks Road	1956 1976	Gregg Burn Hand Thinning	Last year of thinning in Gregg Burn

	Gregg Burn	1956	1	N 53 13.854 W 117 25.824	Gregg Burn 1956 Juvenile Spacing early70s	1956 1971+	Gregg Burn Hand Thinning	Zimmer Block Jack Wright advised that the stand at the junction of the wellsite road and Gregg River Road was thinned in the early 70s by a small crew of "juvenile offenders".
	Helicopter Perspective		Image taken from above Gregg River, shooting SE into Gregg Burn					
	Hwy 40 Hillside	1960s 1970s	1	N 53 13.147 W 117 27.950	From old road, shooting across block 617			
	Helicopter Perspective		H1 – Shooting West across Hwy 40 H2 – From same location as H1 Gregg Valley series					
	Gregg Valley	1960s 1970s	1	N 53 13.331 W 117 27.591	From recent cut – block 607 – shooting across Gregg River valley to other side		Blocks 70, 71 were cut in 1961, scarified 1963.	Udell supervised planting crew for block 70 in 1967 – Ontario tubes
	Helicopter Perspective		H1 – close view of burned-over (1997) Block 71 on N side of Gregg River, from S side of River H2 – longer view of same valley, block 71 on right side of photo					
McLeod 5	36	1997	1	N 53 18.858 W 117 19.280	Shooting SE from road at edge of residual stand	1998 1999	Scarified for Natural Planted Pl	
	Helicopter Perspective		H1 – above access road, shooting easterly, block to right of road H2 – at west end of block, shooting easterly					
McLeod 6	139	1961	1	N 53 16.435 W 117 12.271	Shooting N along original PR road grade into stand	1961 1979	Scarified for Natural Juvenile Spacing	
	Helicopter Perspective		H1 – From south of block, shooting NW across PR road H2 – closer to block, same perspective					
	183	1969	1	N 53 17.457 W 117 04.562		1970,71 2000	Scarified for Natural Manual cleaning/ girdling	
	Helicopter Perspective		H1 – Shooting NW across block, parallel to access road H2 – Shooting SW across block across access road					

	211	1966	1	N 53 16.787 W 117 11.093	Old access trail, shooting NE into block	1967	Scarified for Natural	
	Helicopter Perspective		H1 – Shooting S across Robb Road, ground photopoint is just off access road along old trail H2 – Shooting W along Robb Road, block on left side of road					
	213	1966		No ground reference point		1967	Scarified for Natural	
	Helicopter Perspective		H1 From above PR road at big elbow, shooting east across blocks 534a and 210; 213 dominates the skyline					
	532	1969	1	N 53 16.718 W 117 10.120	Shooting SW from Robb Road	1969	Scarified for Natural	
	Helicopter Perspective		H1 – from SE of pond, N of Robb Road, shooting South. Seismic line just visible in left side of image is just inside the top part of the block. H2 – same perspective, shifting slightly W – note same large bush at road edge. This image blends into block 211, cannot distinguish boundary between the two blocks (only 3 yrs difference between harvest)					
	534	1969	1	N 53 16.605 W 117 12.065	Shooting across PR road big elbow to WSW	1969	Scarified for Natural	
	Helicopter Perspective		H1 Shooting from big elbow on PR road to east across 534a and 210					
McLeod 7	33	1973	1	N 53 16.059 W 117 21.059	Shooting SW	1973 1986,1989	Scarified for Natural Juvenile Spacing	
			2	N 53 16.057 W 117 21.091	Interior Stand shot			
	Helicopter Perspective		H1 from south of road, shooting north. Image includes block 33 as well as block 118					
Bighorn Landscape Image	Helicopter Perspective		Shooting NW along Bighorn Ridge, including Blocks 52, 53, 54					
	80	1983	1	N 53 14.797 W 117 30.949	Shooting NW from Hwy	1984 1990 1991	Scarified for Natural Bracke SIP Planted Pl	Barrels and Chains began replacing the Crossley Plough in the 80s
			2	N 53 14.746 W 117 30.921	Shooting N along Hwy R/Way			
	Helicopter Perspective		H1 from SE of block, shooting NW along Hwy 40 – block on left side of Hwy H2 from NE of block, shooting SW back towards the Hwy 40 ridge viewscape					

	81	1981	1	N 53 16.674 W 117 31.734	Shooting Westerly from Hwy 40 R/Way	1983 1988 1989	Scarified for Natural Bracke SIP Planted Pl	Scarified without drags
			2	N 53 16.784 W 117 32.215	SW from Cold Ck Rd			
	Helicopter Perspective		H1 from SE of block, shooting NW					
	118	1987	1	N 53 16.018 W 117 21.065	Shooting SW from Rd	1987 1990	Scarified for Natural Planted Pl	
			2	N 53 16.044 W 117 21.115	Stand Interior, shooting W			
	Helicopter Perspective		See image for block 33					
	2172	1994		N 53 15.063 W 117 24.528	Shooting northerly from esker on N side of road			Full utilization remote chipper block
	Helicopter Perspective		H1 from south of road, shooting north towards Bighorn Ridge					
McLeod 9	28	1956	1	N 53 20.767 W 117 22.229	Along access Rd - north side	1957 1962 1965,67	Scarified for Natural Seeding PlSw Planting PlSw	Large block – 270 ha – chosen to test Crossley's theory of pine regen
			2	N 53 20.440 W 117 23.520	From access Rd, view of hillside			
	Helicopter Perspective		H1 – along Quigly Creek W of access road, shooting HE H2 – same perspective, more straight on and closer view of block H3 – Further east along block shooting back to SW. Clearing in bottom of frame is where ground photopoints were chosen H4 – long view of block to NW from east end, above Quigly Creek					

Berland 2	37	1978			100 ha cut with "leave" strips of old roads for wildlife corridors	1979, 1980 1986 1987	Scarified for natural 2.4 ha Bracke SIP 2.4 ha Planted Pl	No Ground Point 391 Ha cut in blocks 36, 37 in 1978 – continuation of progressive CC
	Helicopter Perspective		H1 from NE corner of block shooting SW along "corridors" H2 from SW of block shooting NE					
Berland 3	15	1959	1	N 53 42.191 W 118 19.267	From old campsite	1961 1981	Scarified for Natural Juvenile Spacing	
			2	N 53 42.331 W118 19.387	Interior stand adjacent to road			
			3	N 53 42.320 W 118 19.409	Along road			
	Helicopter Perspective		H1 – long shot to North across campsite, block on north side along road H2 – similar shot, somewhat closter					
	549	1977	1	N 53 43.900 W 118 19.000	East Side of Block	1978	Scarified for Natural	Not in Report – early image on file appears incorrectly named.
	Helicopter Perspective		H1 – from east side of access road, shooting West H2 – from south side of block, shooting NNW along access road, block on left side					
	C20	1970	1	N 53 43.348 W 118 16.126	From Road	1971	Scarified for Natural	Zimmer Block
			2	N 53 43.363 W 118 16.106	Interior stand			
	Helicopter Perspective		H1 – NEEDS NEW IMAGE, IMAGES BRACKET BLOCK					
Berland 4	22	1964	1	N 53 39.305 W 118 09.598	From old Lower Road	1965 1976 1986	Scarified for Natural 4 ha planted 8 ha Juvenile Spacin	Large block, 255 ha
	Helicopter perspective		H1 – shooting to SW along old Lower Road from interior block					

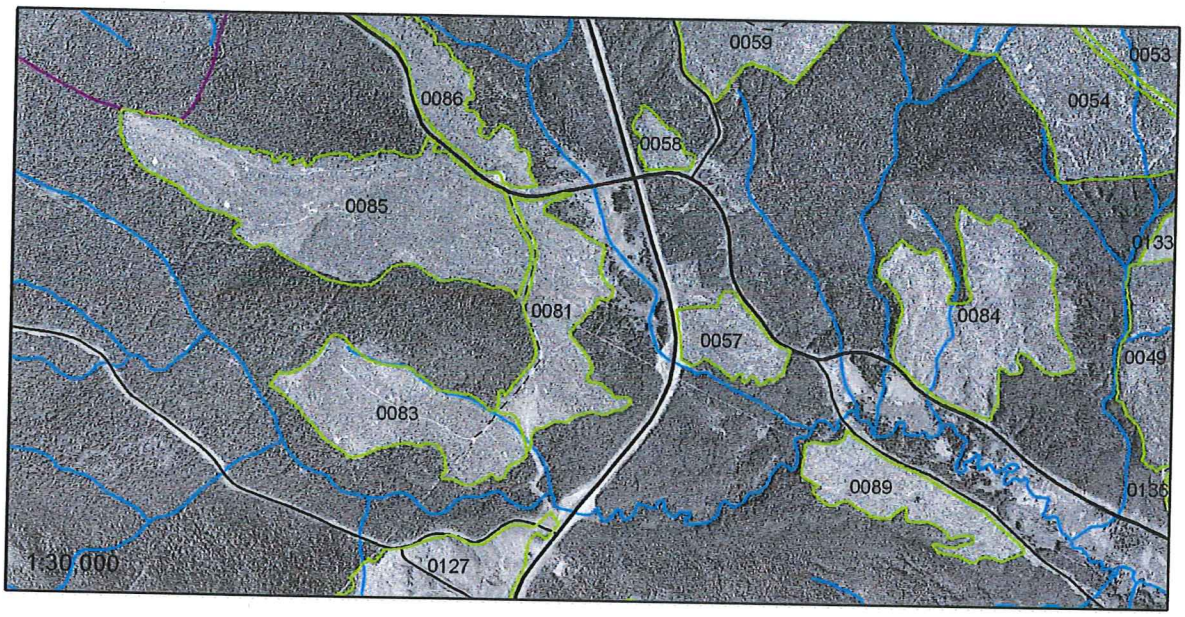
Berland 4 Cont'd	230	1994	1	N 53 41.279 W 118 14.805	Shooting SE			
	Helicopter Perspective		H1 From above Hwy 40, shooting N along Hwy, block on right side of Hwy, ground photopoint at pullout on right					
	K10	1965	1	N 53 39.438 W 118 13.377	Shooting NW from Hwy 40	1966 1976, 1980	Scarified for Natural Small part of block (3 ha) planted Pl	Zimmer Block
	Helicopter Perspective		H1 – From SW side of Hwy 40, shooting NW					
Berland 5	24	1975	1	N 53 39.940 W 118 05.936	At road jct.	1975	Scarified for Natural	
	Helicopter Perspective		H1 from S side of Hightower Road, shooting to NE across road into Block 24. H2 just above ground photopint (lower right, bottom), shooting NE along old access road					
	90	1980	1	N 53 41.085 W 118 11.575	Shooting NE	1981 1988	Scarified for Natural Planted Pl	
	Helicopter Perspective		H1 From west side of access road, shooting to NE across block 90. Block 37 visible in background.					
Berland 8	26	1956	1	N 53 36.436 W 118 05.009	Shooting NE		Left for Natural	
			2	N 53 36.297 W 118 04.413	Shooting N from Hwy 40			Zimmer Block
	Helicopter Perspective		H1 – shooting NNE across the junction of the pipeline and old Lower Road just above Hwy 40 north of Fred Creek. Ground photopoint is at the junction.					
	28	1959	1	N 53 35.842 W 118 03.743	Stand Interior	1960 1962 1976, 1979	Scarified for Natural Seeded by hand 8 ha replanted	Zimmer Block
			2	N 53 35.888 W 118 03.707	Shooting SW from Hwy 40			
	Helicopter		H1 – from old Lower Road, shooting northerly, Block 28 is the large block on the hill north of the pond.					

	Perspective		H2 – from east of the Railnet railway, shooting SW across the railway and Hwy 40					

West Fraser Photo Retrospective Project 2006
Appendix 2:
List of Blocks by Decade and Compartment

W.C./ Compartment	Block	Year Cut	Area	Reforestation Status 2006	Notes
1950s – 5 Blocks					
McLeod 9	28	1956		SR	Large pine cut
Berland 3	15	1959		SR	
Berland 8	26	1956		SR	"Zimmer Block"
	28	1959		SR	"Zimmer Block"
Marlboro 7	2	1958		SR	Mechanical Thinning Block
1960s – 15 Blocks					
Athabasca 5	36	1966		SR	High elevation cut
Athabasca 13	107a	1966		SR	Experimental Bomb Site
Embarras 3	1	1960		SR	
McLeod 1	51Y	1962		SR	Fertilization Trial Site
	168Y	1962		SR	Ontario Tubeling Plantation
McLeod 2	10	1960		SR	
	16	1960		SR	First PCT block, 1977
	27	1961		SR	"Two Metre Rule" story
McLeod 6	139	1961		SR	"Zimmer Block"
	211	1966		SR	"Zimmer Block"
	213	1966		SR	"Zimmer Block"
	532	1969		SR	"Zimmer Block"
Berland 3	C14	1966		SR	"Zimmer Block"
Berland 4	22	1964		SR	Large pine cut
Berland 8	K10	1965		SR	"Zimmer Block"
1970s – 6 Blocks					
Athabasca 14	619	1972		SR	Deep duff blading
	625	1972		SR	
McLeod 2	570	1975		SR	Demo Block for 1981 Greenhouse Opening
McLeod 7	33	1973		SR	
Berland 2	37	1978		SR	Part of large experimental clearcut system 1975-79
Berland 5	24	1977		SR	Part of large experimental clearcut system 1975-79
1980s – 7 Blocks					
Athabasca 13	773	1980		SR	Cuts designed to facilitate ski trail development
Athabasca 14	793	1982		SR	CS Plow Site Preparation

Marlboro 11	38	1982		SR	Experimental herbicide block
McLeod 7	80	1983		SR	
	81	1981		SR	
	118	1987		SR	
Berland 5	90	1980		SR	
1990s – 3 Blocks					
McLeod 5	36	1997		SR	
McLeod 7	2172	1994		SR	Remote Chipping Block
Berland 4	230	1992		SR	
Total Blocks	36				



Appendix 3: Maps

Historical Photo Project and Archive: Map Series Introduction

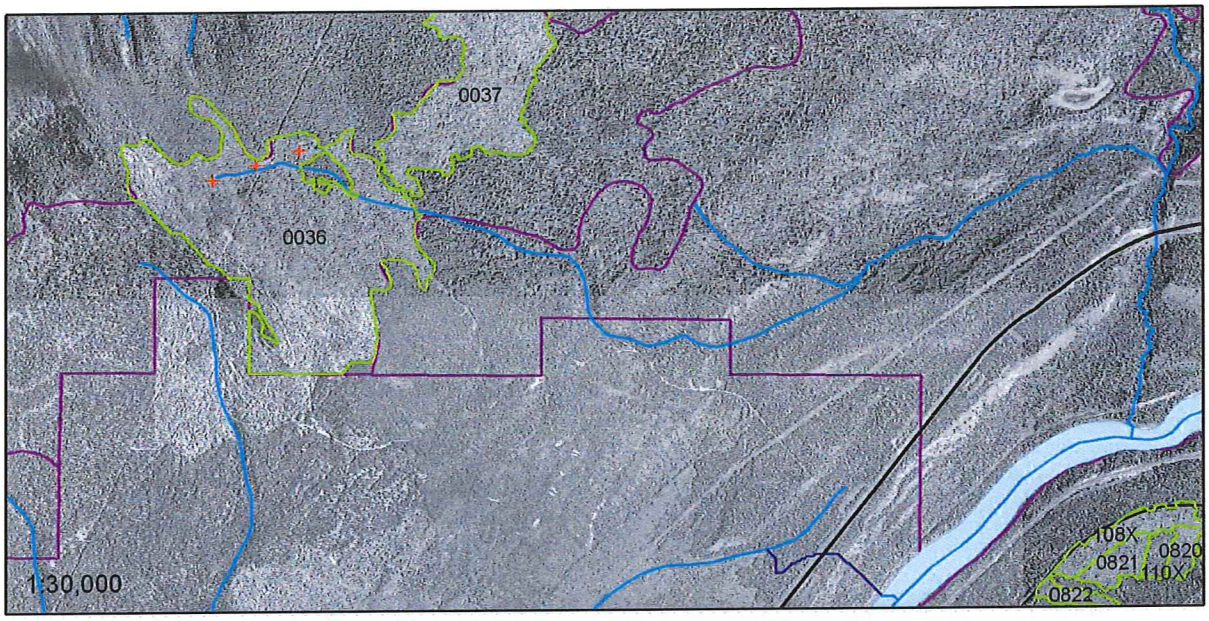
In the ensuing series of orthophoto maps and notations, the general location of the ground photopoints used in this project are shown as red stars, and the latitude/longitude of the points are listed below the map reference. Most maps are 1:30,000 scale unless noted otherwise.

The sequence of maps is the same as Appendix 2 - the Silviculture History - i.e. in numerical order of Operating Compartments by Working Circle, blocks in numerical sequence also:

Athabasca (W.C.1)	- Compartments 5, 13, 14
Marlboro (W.C. 2)	- Compartments 2, 11
Embarras (W.C. 3)	- Compartment 3
McLeod (W.C. 4)	- Compartments 1,2,6,7,9
Berland (W.C. 5)	- Compartments 2,3,4,5,8

1. Athabasca Working Circle

Block 36, Athabasca 5. Cut 1966.



Photopoints Blk 36	
1	N 53 22.444 W 117 48.047
2	N 53 22.603 W 117 48.061
3	N 53 22.582 W 117 48.400

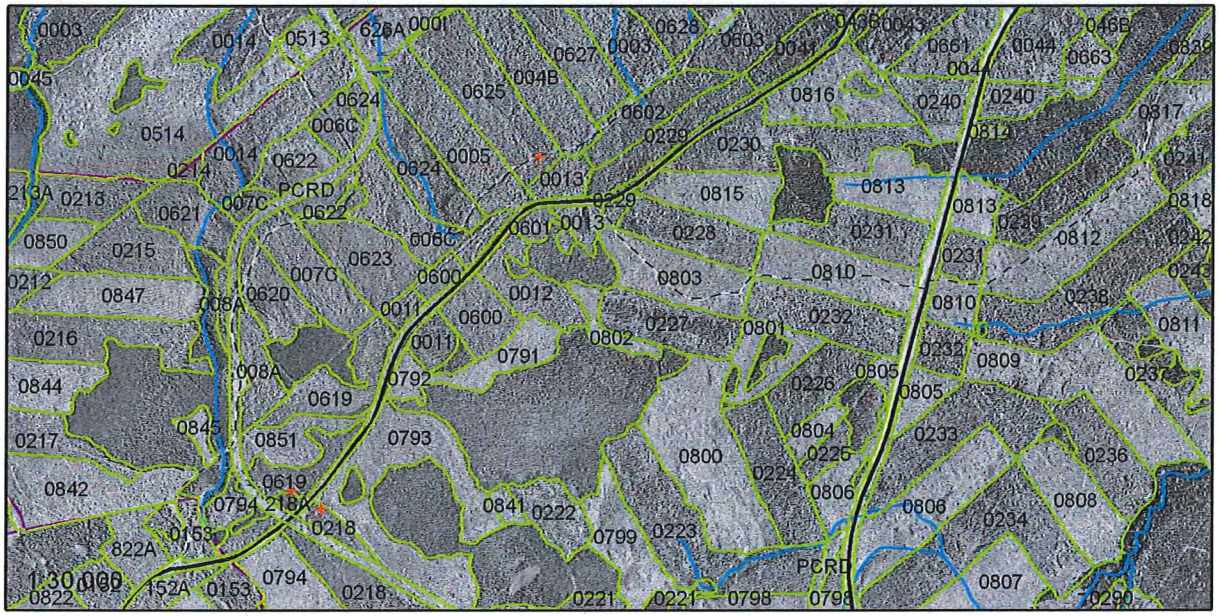
Block 107A, Athabasca 13. (The Bomb Experiment) Cut 1966

PPts Blk 107A	
1	N 53 31.721 W 117 44.028
2	N 53 31.736 W 117 44.004

PPts Blk 773	
1	N 53 32.639 W 117 42.897

Block 773, Athabasca 13. (Camp 29 Ski Trail Development) Cut 1980

Block 619, Athabasca 14. (Blading and Planting) Cut 1972
Block 625, Athabasca 14. (Blading and Planting) Cut 1972
Block 793, Athabasca 14. (Ripper Plough and Planting) Cut 1982



PPts Blk 619	
1	N 53 33.277 W 117 39.374

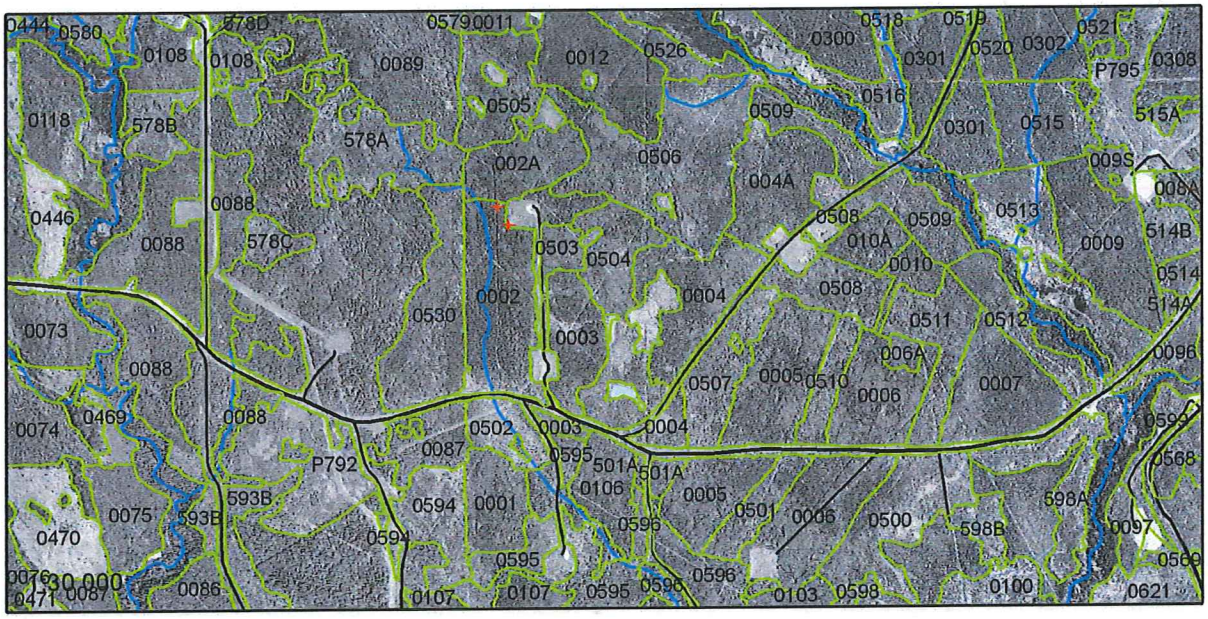
PPts Blk 625	
1	N 53 34.032 W 117 38.446

PPts Blk 793	
1	N 53 33.244 W 117 39.298

Blocks 793 (l) and 619 (r) - aerial view looking south

2. Marlboro Working Circle

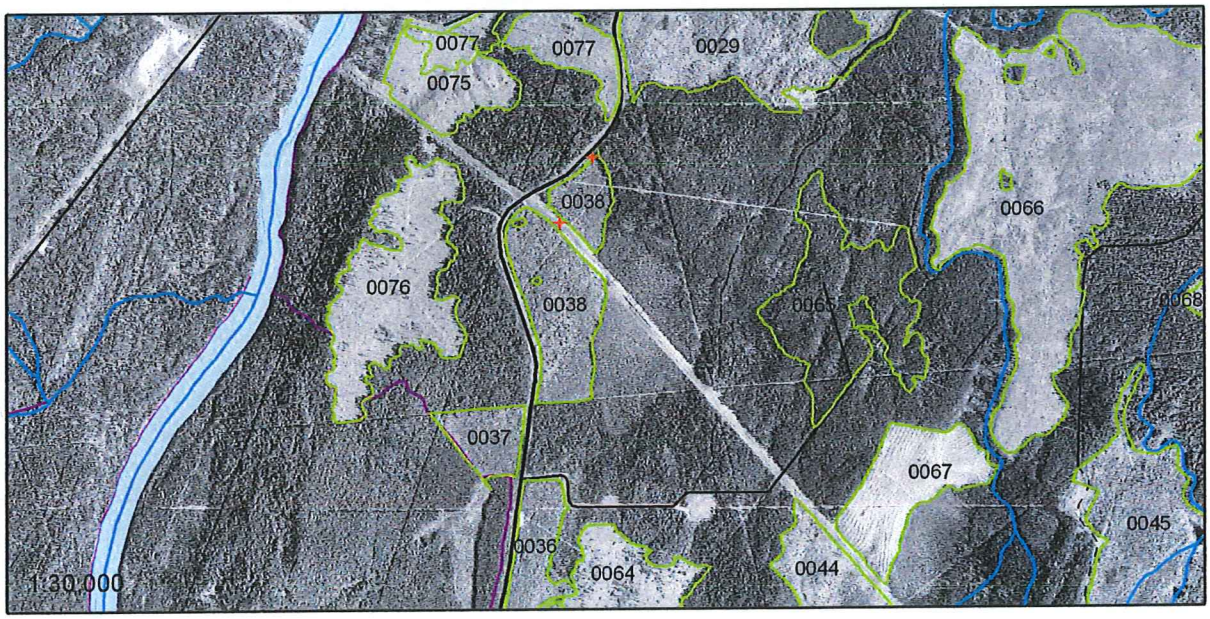
Block 2, Marlboro 2. (Mechanical Thinning) Cut 1958



PPts Blk 2	
1	N 53 46.630 W 116 40.355
2	N 53 46.669 W 116 40.406

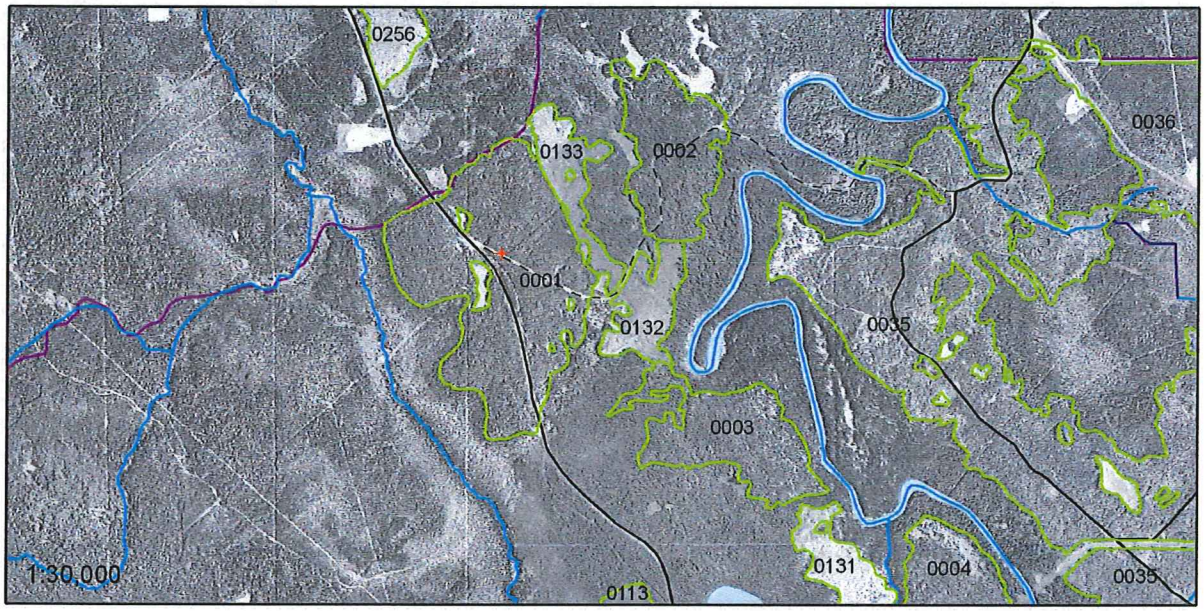
PPts Blk 38	
1	N 53 53.027 W 117 05.721
2	N 53 52.835 W 117 05.780

Block 38, Marlboro 11. (Bracke Herbicide Experiment) Cut 1982



3. Embarras Working Circle

Block 1, Embarras 3. (Juvenile Spacing) Cut 1960



PPts Blk 1	
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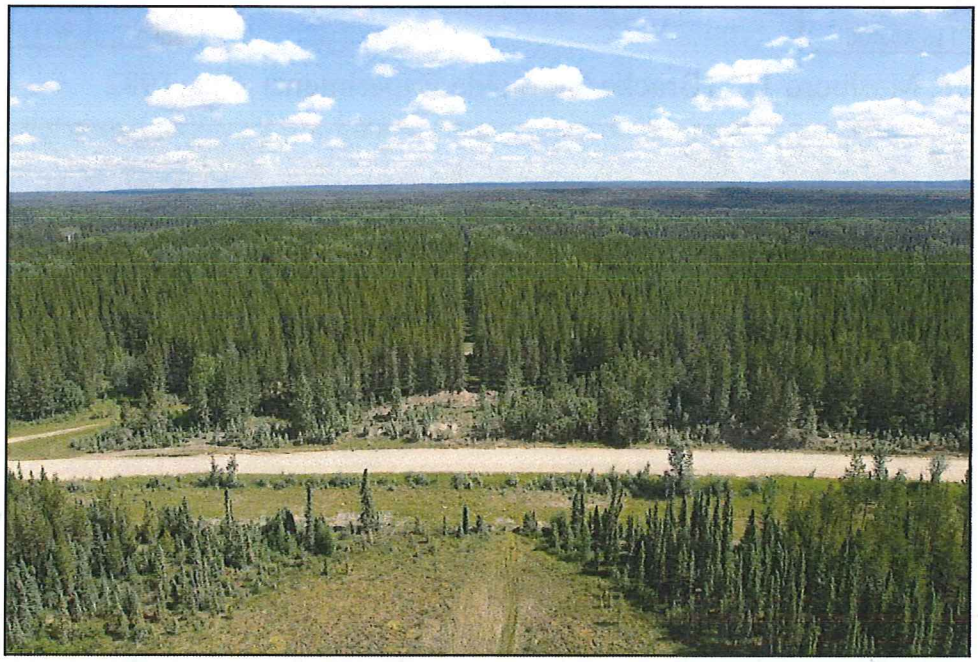
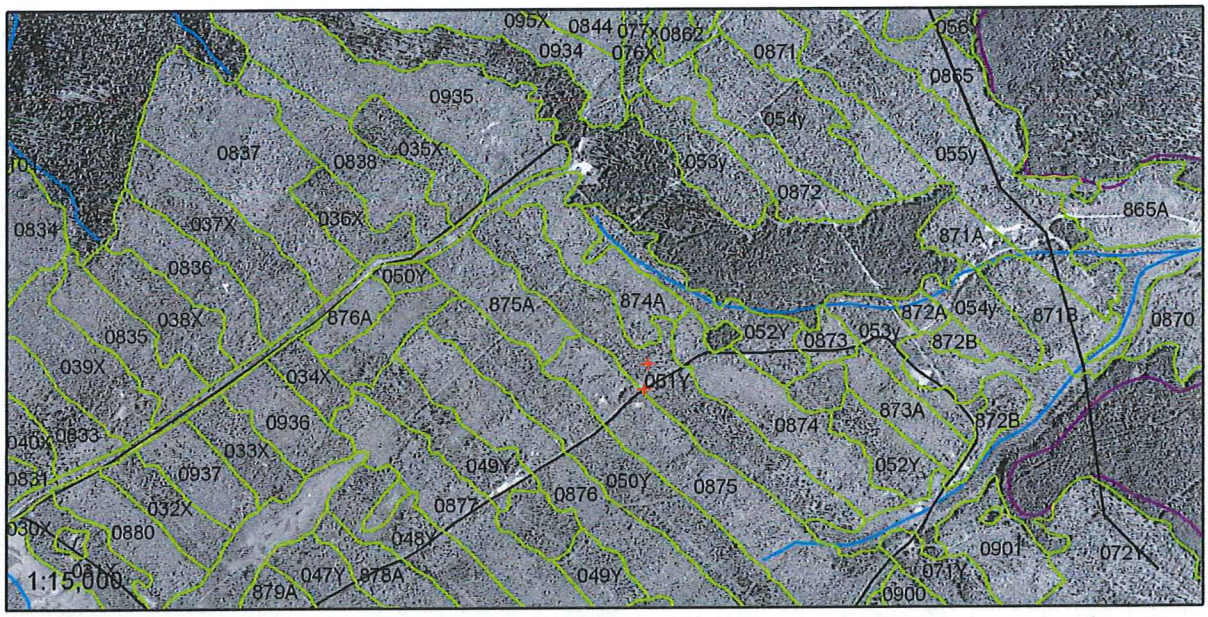


Looking East across Block 1, Embarras 3. 2006 Aerial View

4. McLeod Working Circle

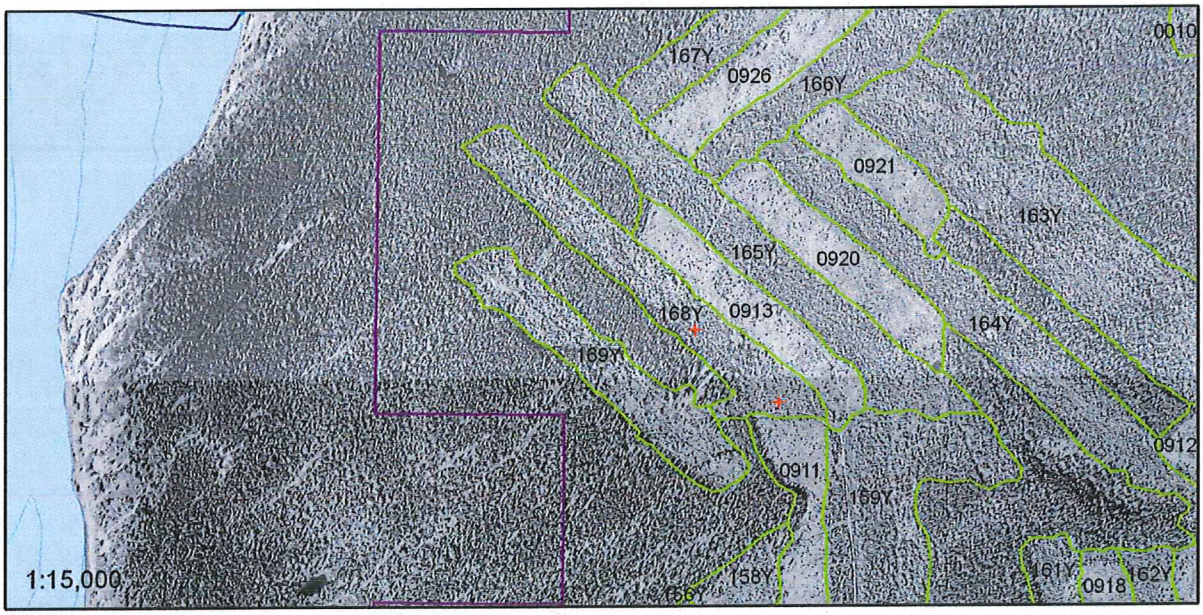
Block 51Y, McLeod 1. (Fertilizer Experiment) Cut 1962



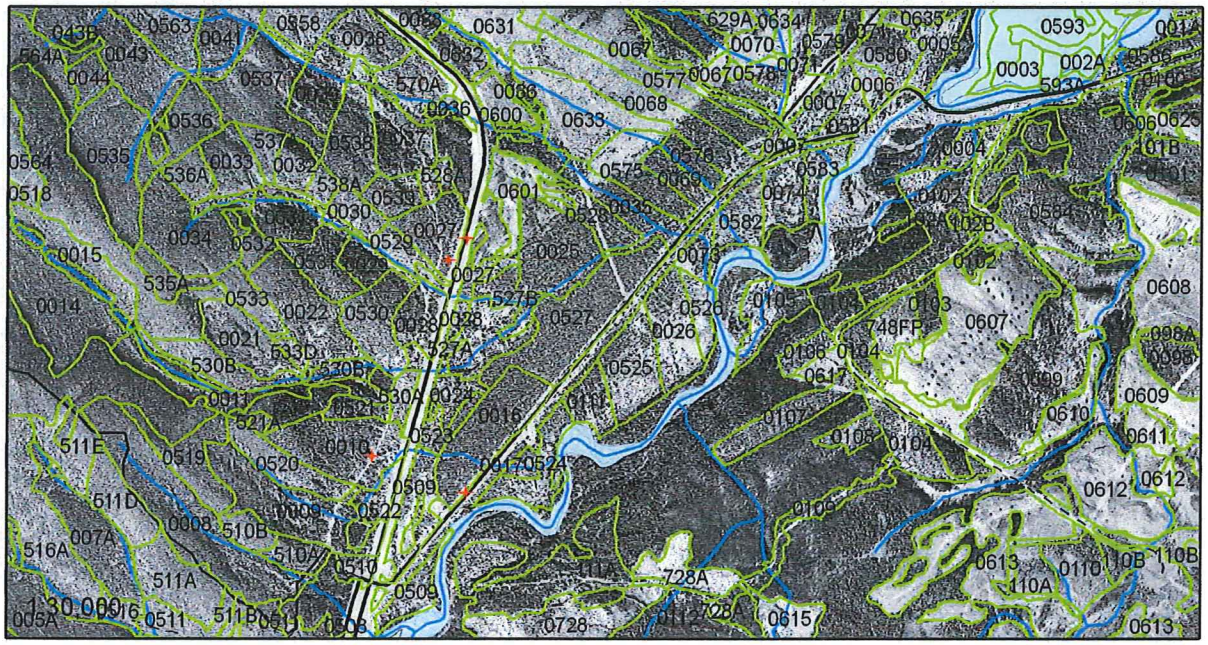
PPts Blk 51Y	
1	N 53 20.114 W 117 43.754
2	N 53 20.098 W 117 43.704

PPts Blk 168Y	
1	N 53 15.149 W 117 50.185
2	N 53 15.042 W 117 50.032

Block 168Y, McLeod 1. ("Ontario Tube" Plantation) Cut 1962



Block 10, McLeod 2. (Juvenile Spacing) Cut 1960
Block 16, McLeod 2. (1st Juvenile Spaced regen block) Cut 1960



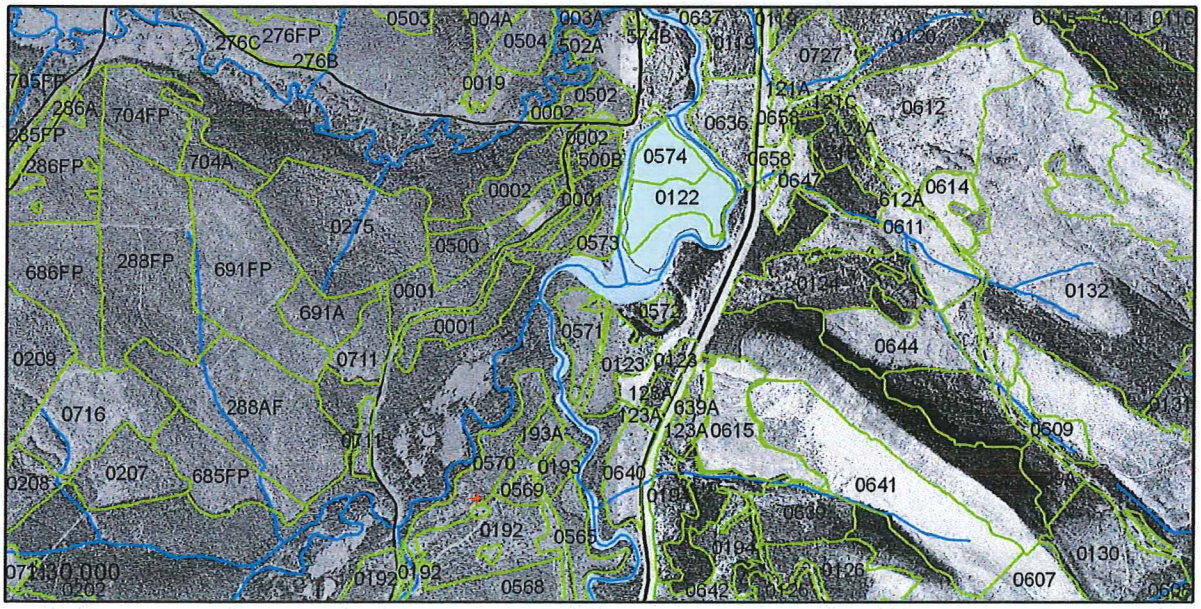
PPts Blk 10	
1	N 53 12.875 W 117 29.815

PPts Blk 16	
1	N 53 12.823 W 117 29.436

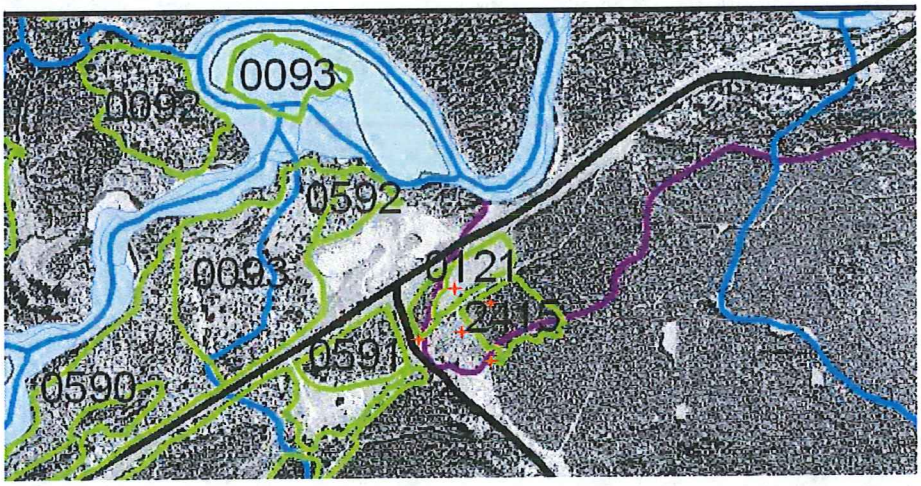
PPts Blk 27	
1	N 53 13.411 W 117 29.441
2	N 53 13.421 W 117 29.420

PPts Blk 570	
1	N 53 10.888 W 117 30.717

Block 570, McLeod 2. Greenhouse Opening Demo 1981. Cut 1975



50 Millionth Plantation, McLeod 2 - 1991
100 Millionth Plantation, McLeod 2 - 1999
150 Millionth Plantation, McLeod 2 - 2005



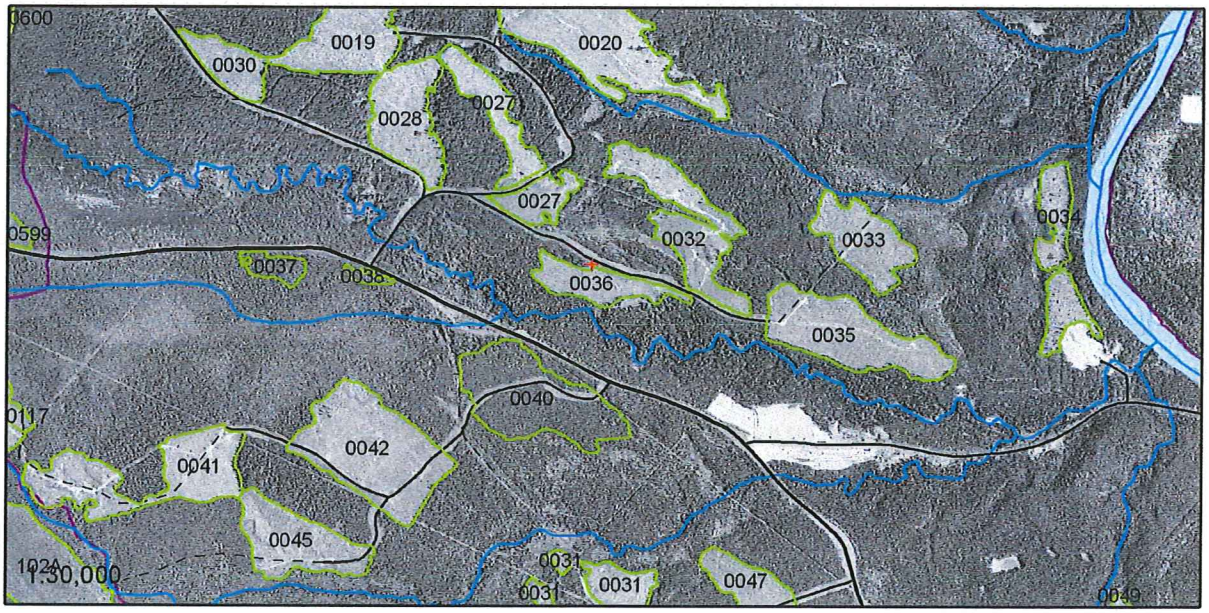
PPts 50 MM	
1	N 53 14.580 W 117 23.183
2	N 53 14.586 W 117 23.269
3	N 53 14.611 W 117 23.242

PPts 100 MM	
1	N 53 14.644 W 117 23.230

PPts 150 MM	
1	N 53 14.631 W 117 23.209

(above) Looking South Across Ceremonial Plantations. 2006 Aerial View

Block 36, McLeod 5. Cut 1997

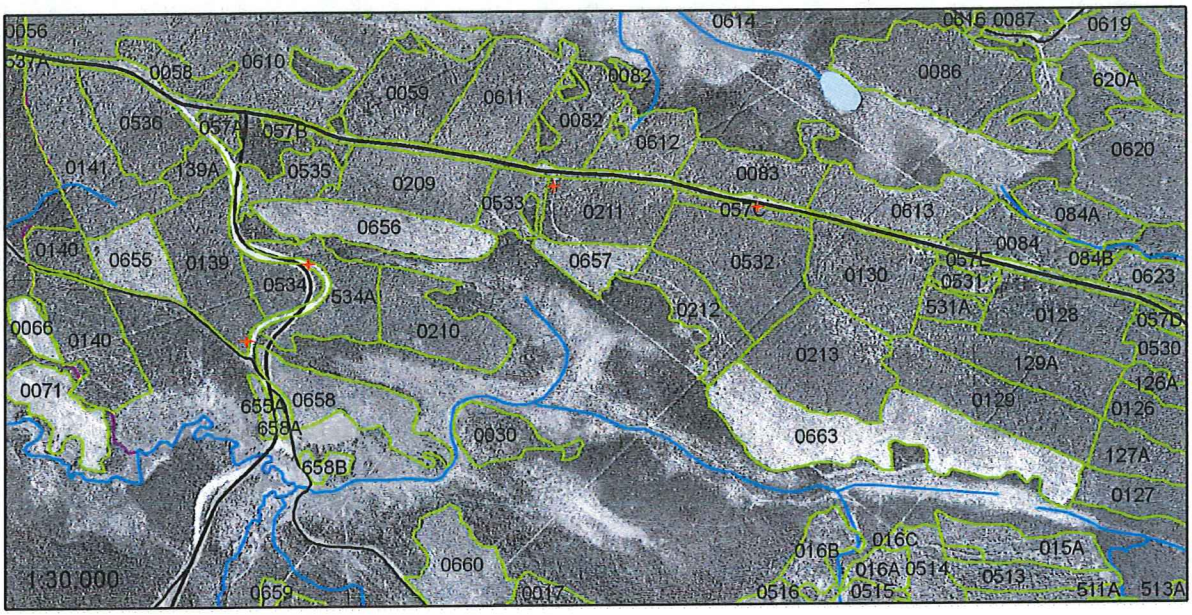


PPts Blk 36	
1	N 53 18.858 W 117 19.280

(below) Aerial View of Block 36, McLeod 5 looking East. 2006

"Zimmer Report" Blocks, McLeod 6
Photographic Retrospective from 1970 STOP Report

Block 139, McLeod 6. Cut 1961
Block 211, McLeod 6. Cut 1966
Block 213, McLeod 6, Cut 1966
Block 532, McLeod 6, Cut 1969
Block 534, McLeod 6, Cut 1969



PPts Blk 139	
1	N 53 18.858 W 117 19.280

PPts Blk 211	
1	N 53 16.787 W 117 11.093

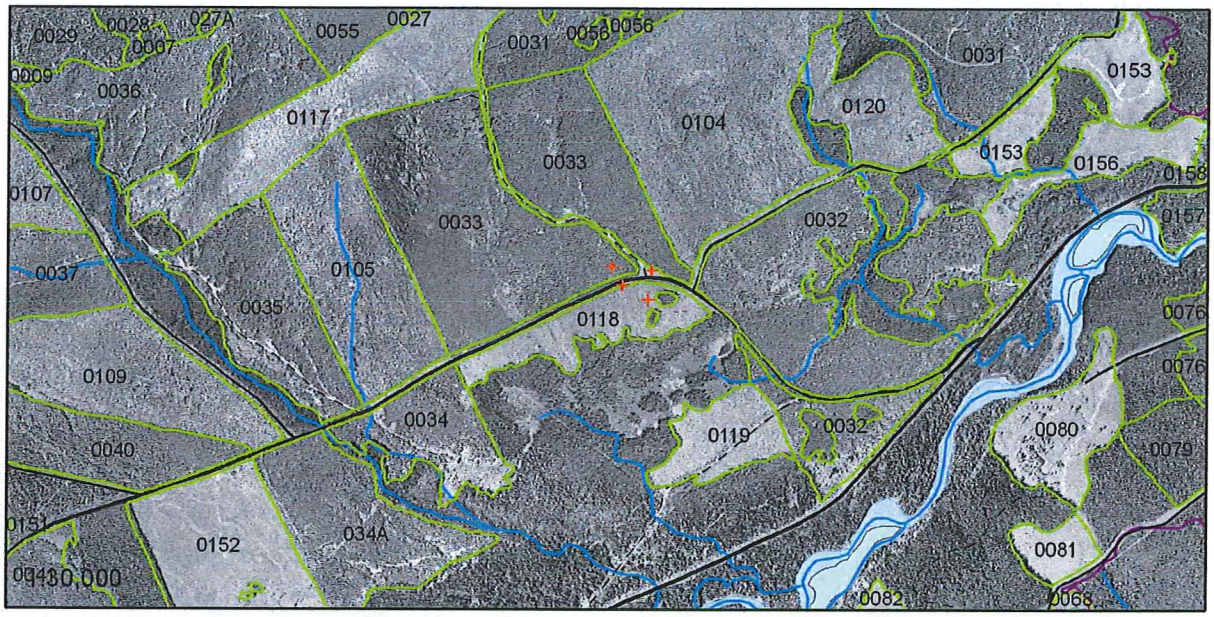
PPts Blk 532	
1	N 53 14.580 W 117 23.183

PPts Blk 534	
1	N 53 14.580 W 117 23.183

PPts Blk 213
Aerial View Only, no ground photopoints

(right) Block 139, aerial view looking north, 2006. The two roads form the south (l) and southeast (r)boundaries.

Block 33, McLeod 7. Cut 1973
Block 118 McLeod 7. Cut 1981

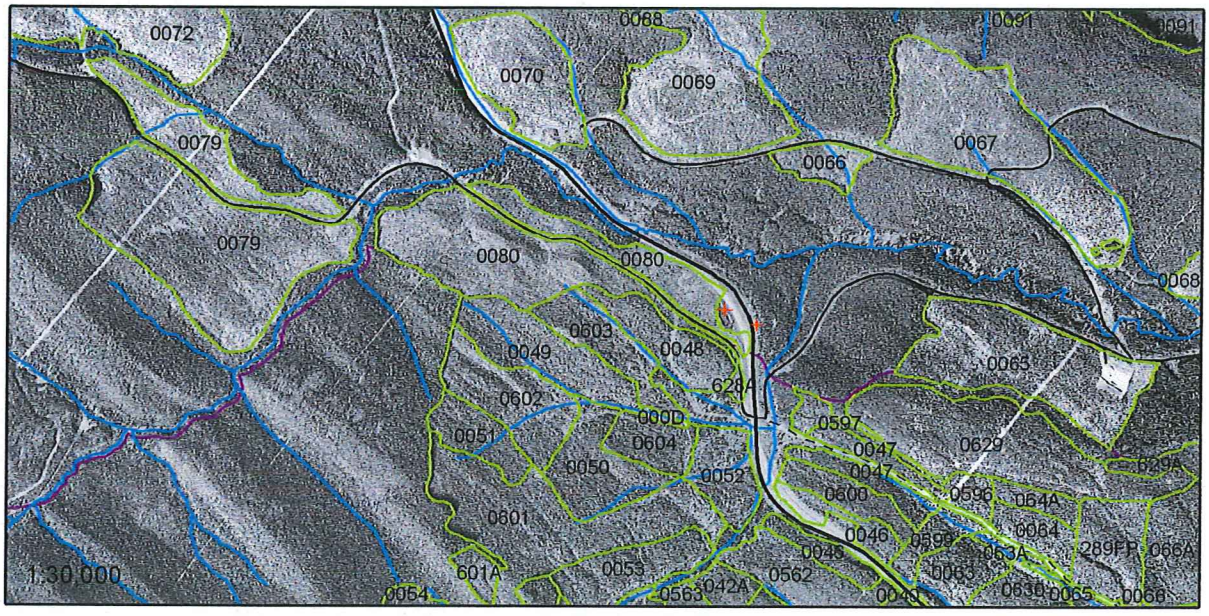


PPts Blk 33	
1	N 53 16.059 W 117 21.059
2	N 53 16.057 W 117 21.091

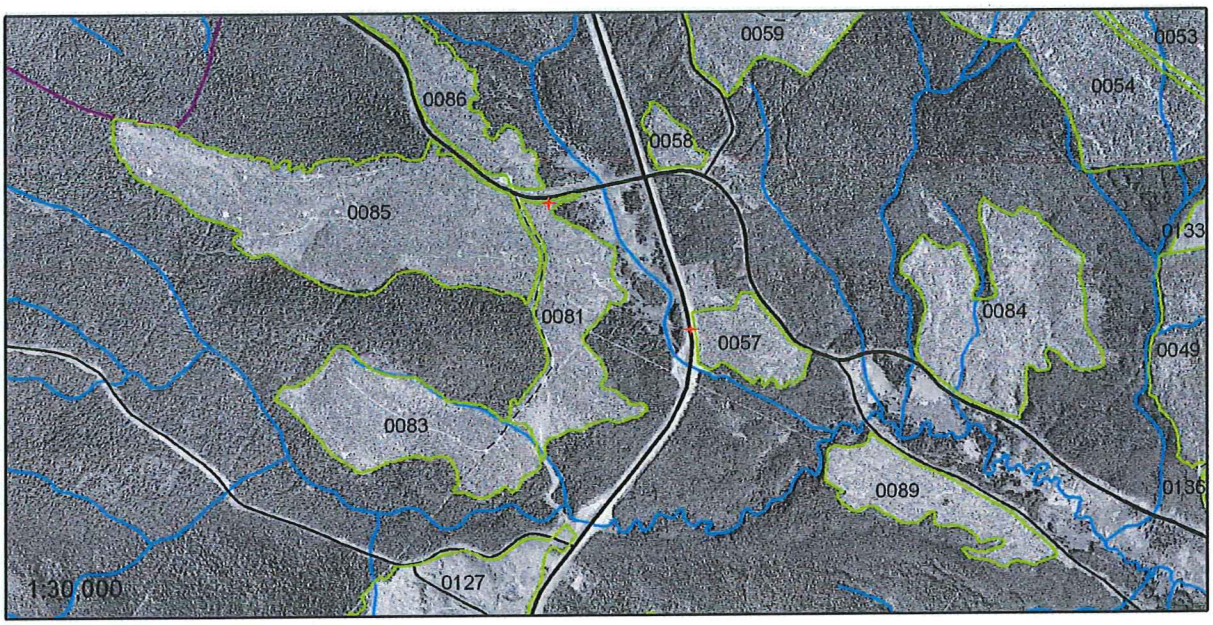
PPts Blk 118	
1	N 53 16.018 W 117 21.065
2	N 53 16.044 W 117 21.115

PPts Blk 80	
1	N 53 14.797 W 117 30.949
2	N 53 14.746 W 117 30.921

Block 80, McLeod 7. Cut 1983



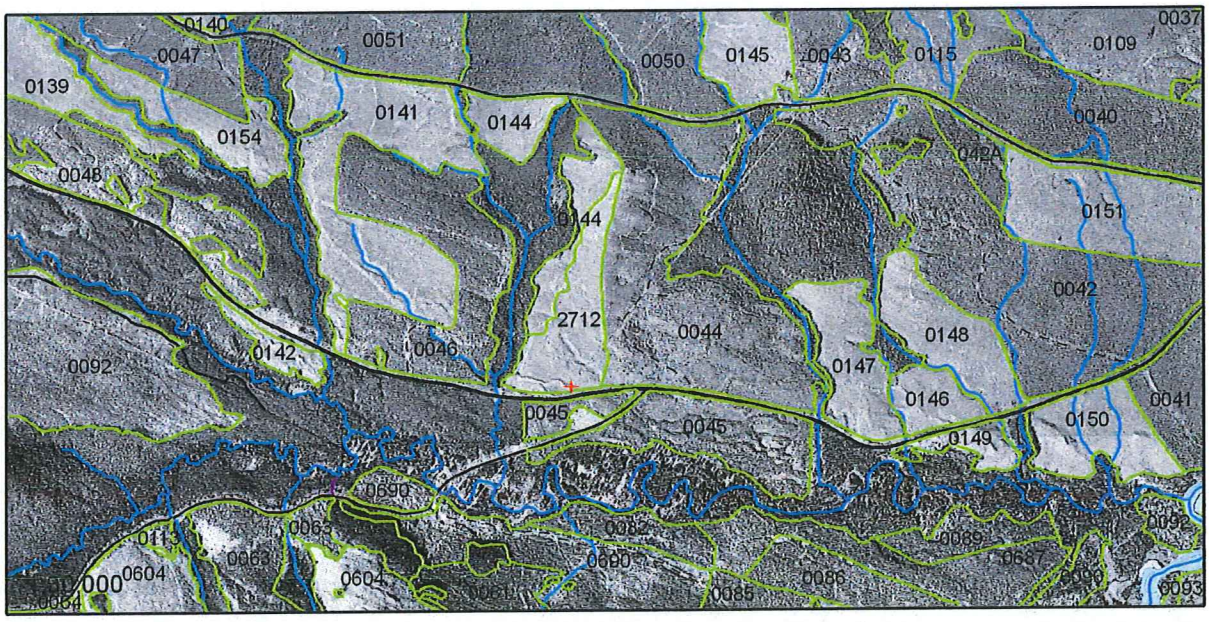
Block 81, McLeod 7. Cut 1981



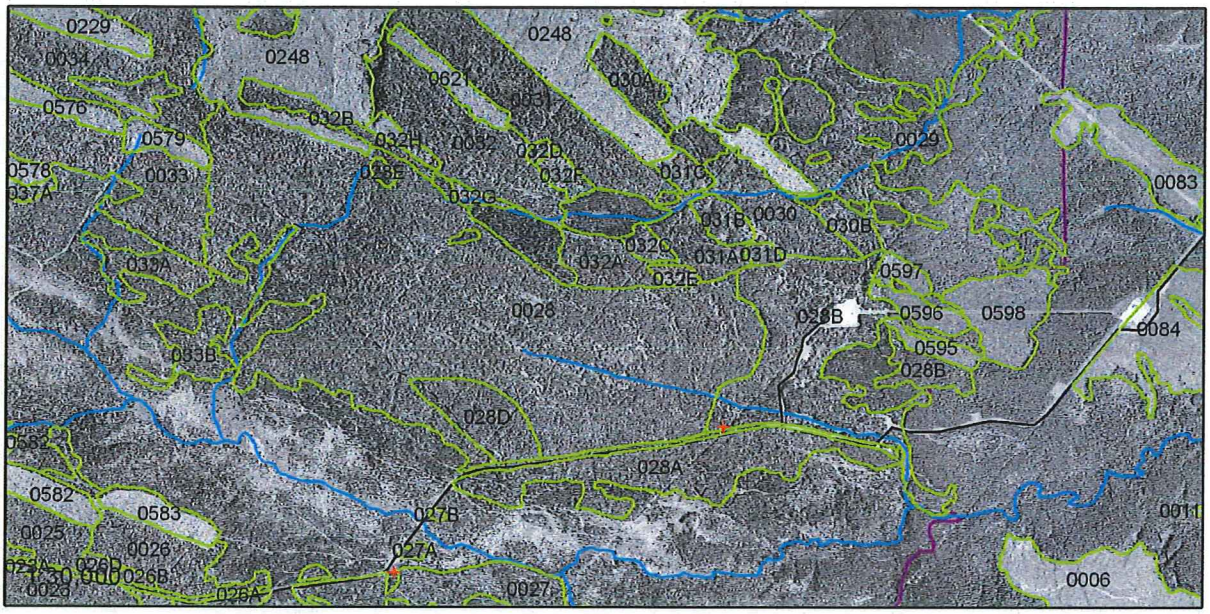
PPts Blk 81	
1	N 53 16.674 W 117 31.734
2	N 53 16.784 W 117 32.215

PPts Blk 2172	
1	N 53 15.063 W 117 24.528

Block 2172, McLeod 7. Cut 1994. Remote Chipper Block

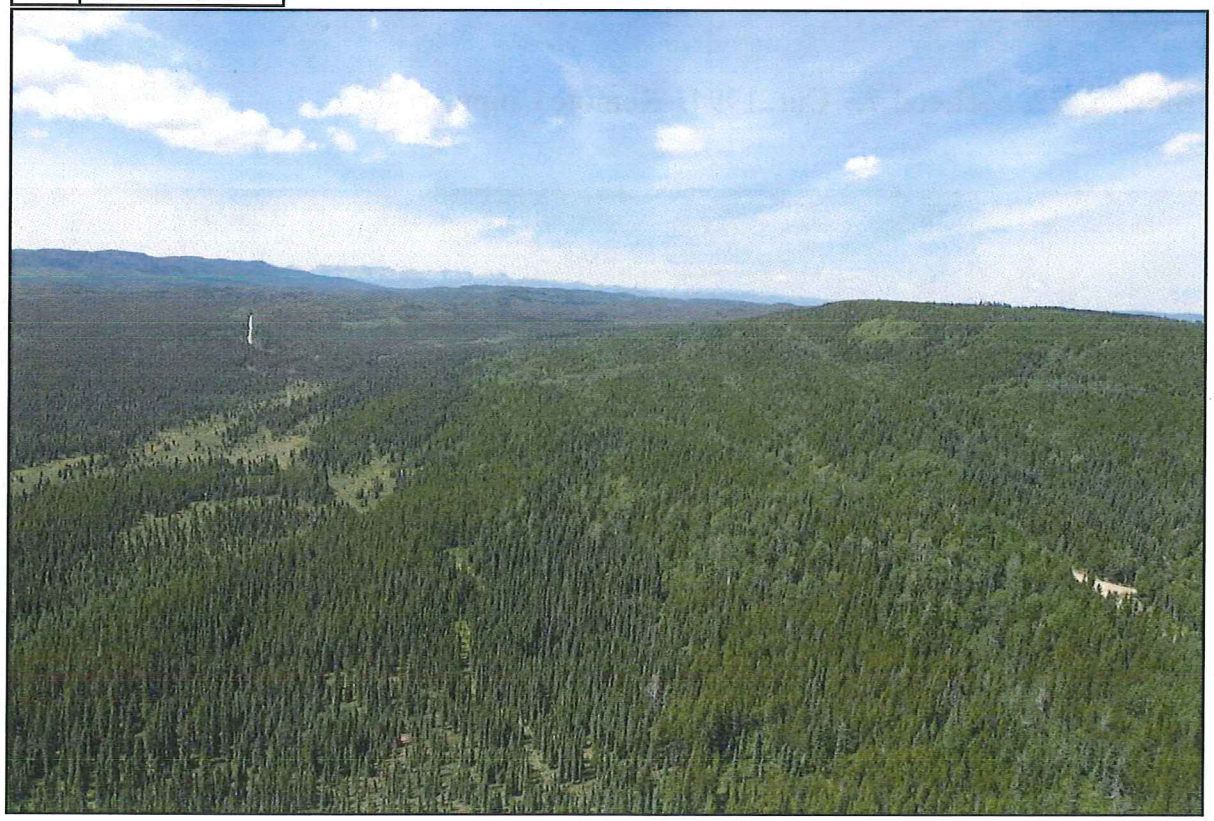


Block 28, McLeod 9. Cut 1956



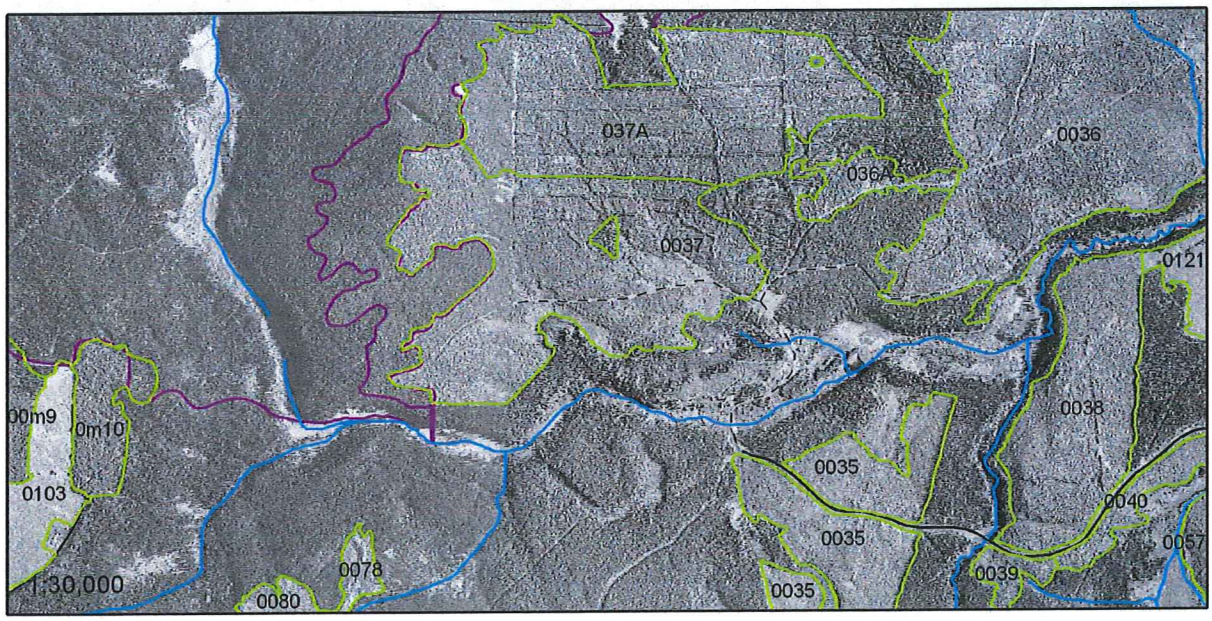
PPts Blk 28	
1	N 53 20.767 W 117 22.229
2	N 53 20.440 W 117 23.520

(below) Aerial view of Block 28 looking northwest. 2006



5. Berland Working Circle

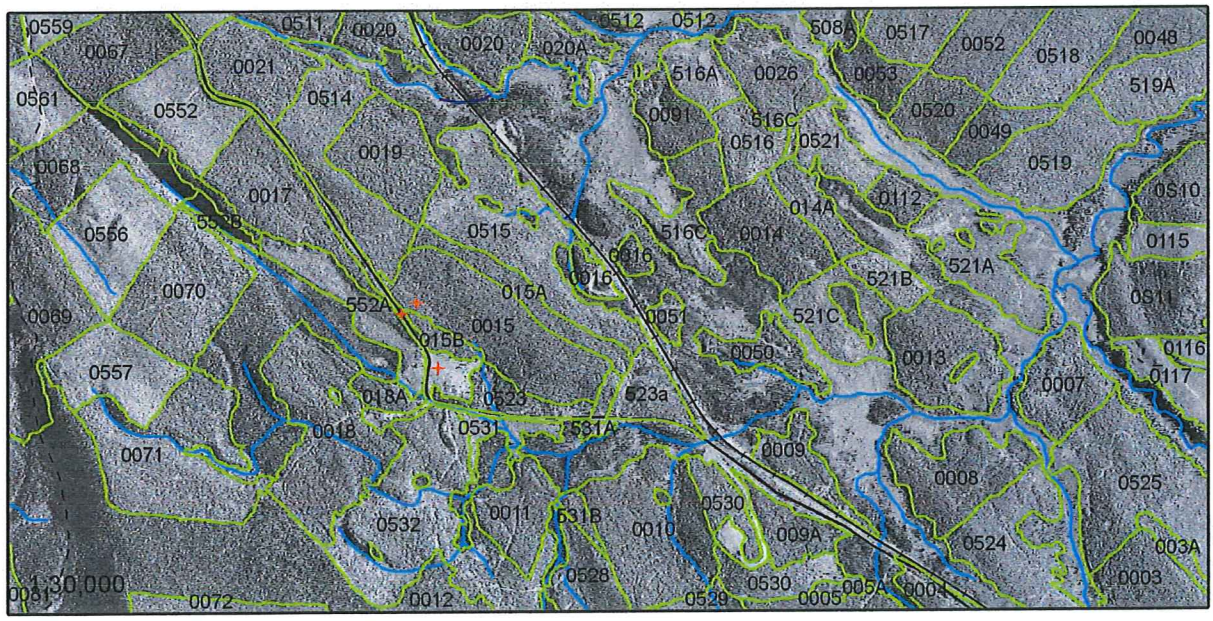
Block 37, Berland 2. Cut 1978. "Wildlife Corridor" retention block



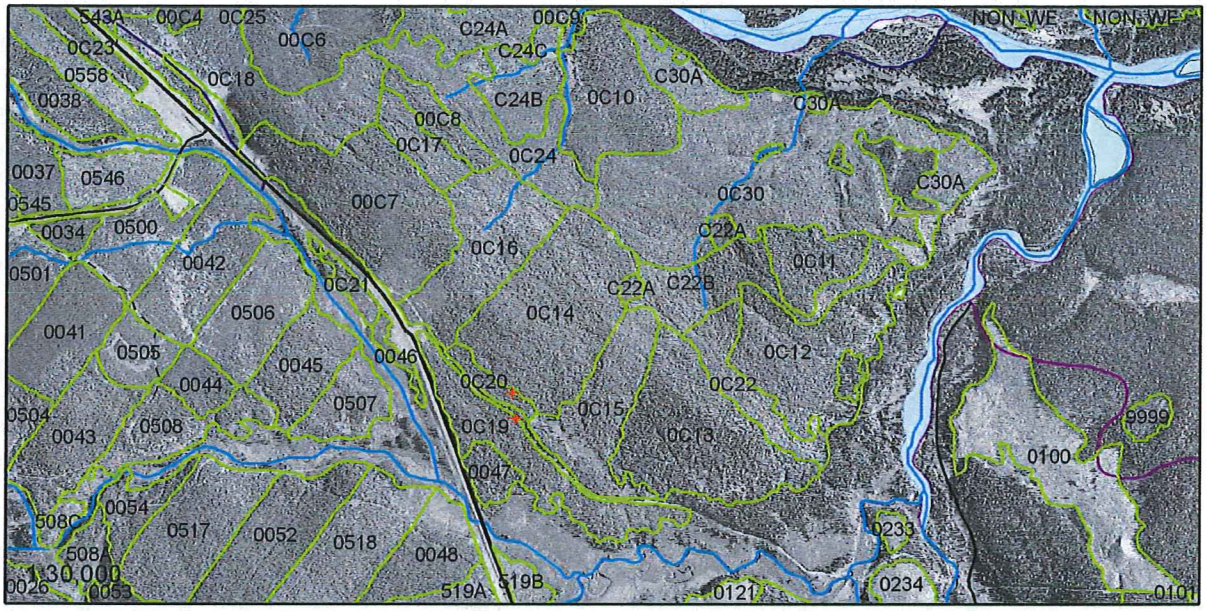
PPts Blk 37
No photopoints, aerial perspective only

PPts Blk 15	
1	N 53 42.191 W 118 19.267
2	N 53 42.331 W118 19.387
3	N 53 42.320 W 118 19.409

Block 15, Berland 3. Cut 1959.



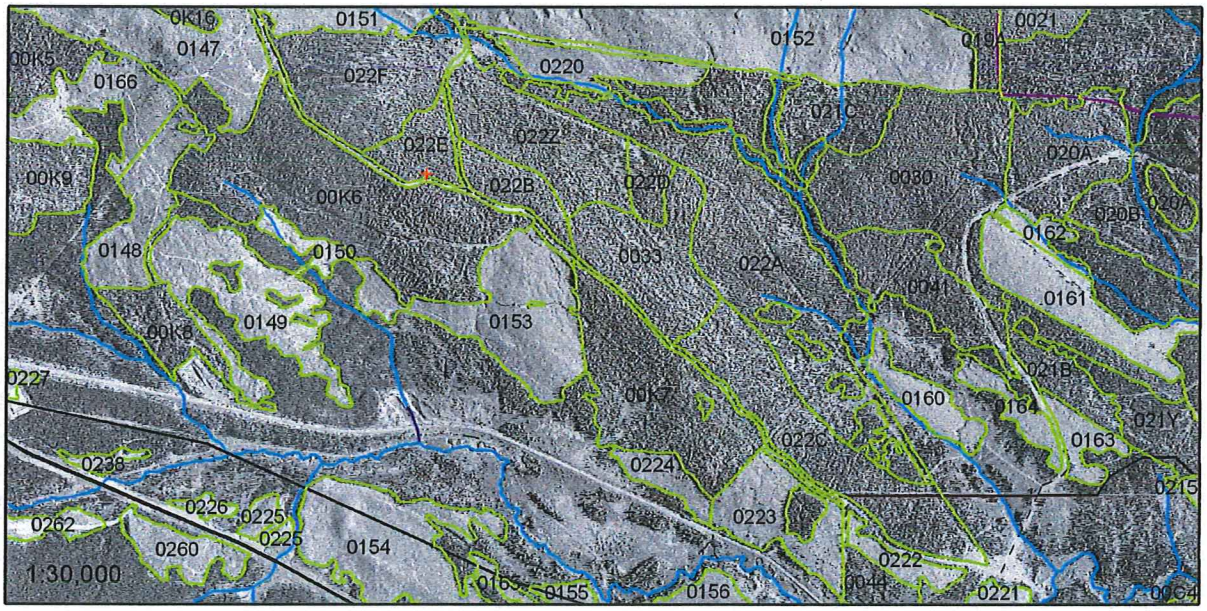
Block C20, Berland 3. ("Zimmer Report" Block) Cut 1970.



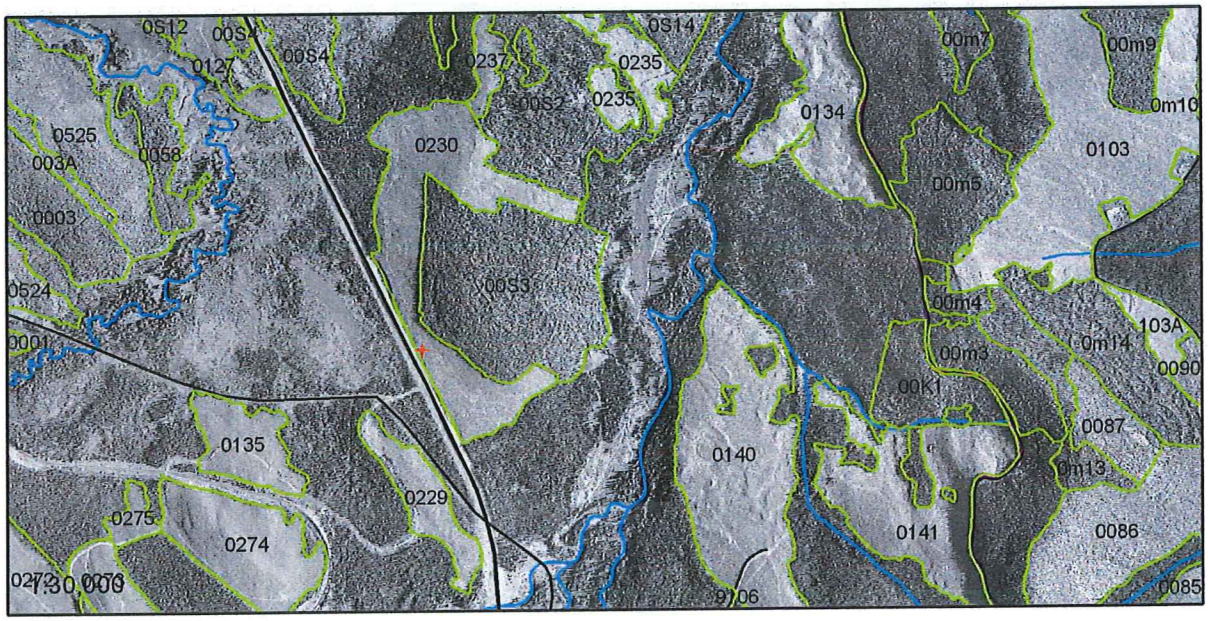
PPts Blk C20	
1	N 53 43.348 W 118 16.126
2	N 53 43.363 W 118 16.106

PPts Blk 22	
1	N 53 39.305 W 118 09.598

Block 22, Berland 4. Cut 1964.



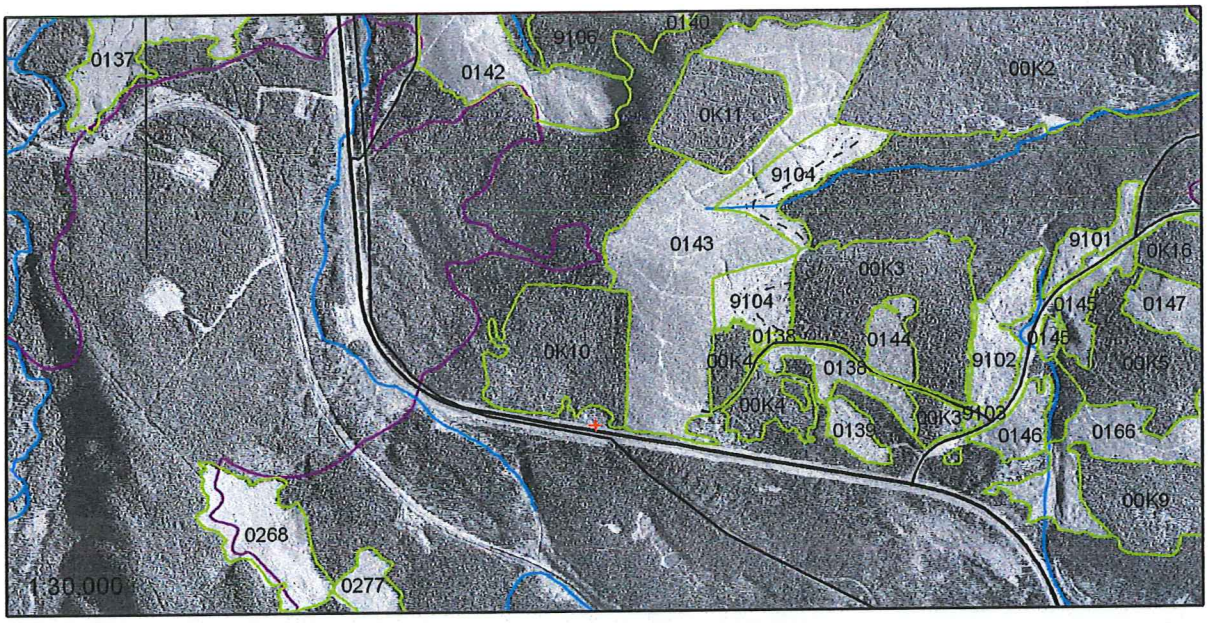
Block 230, Berland 4. Cut 1994.



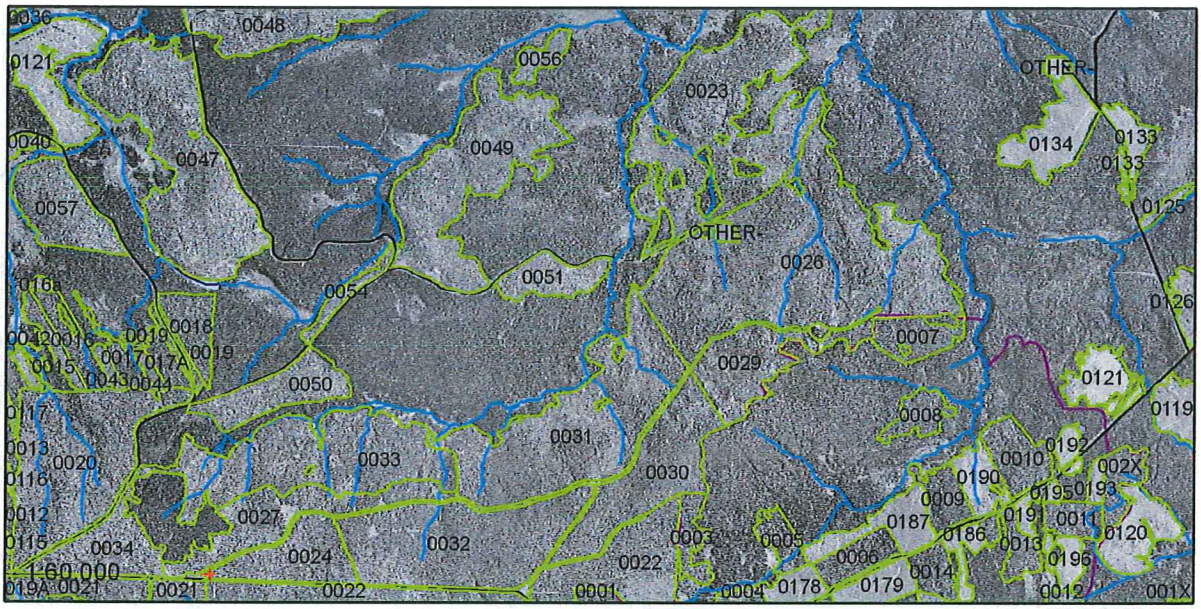
PPts Blk 230	
1	N 53 41.279 W 118 14.805

PPts Blk K10	
1	N 53 39.438 W 118 13.377

Block K10, Berland 4. ("Zimmer Report" Block) Cut 1965.



Block 24, Berland 5. (Large Clear Cut Program) Cut 1975.

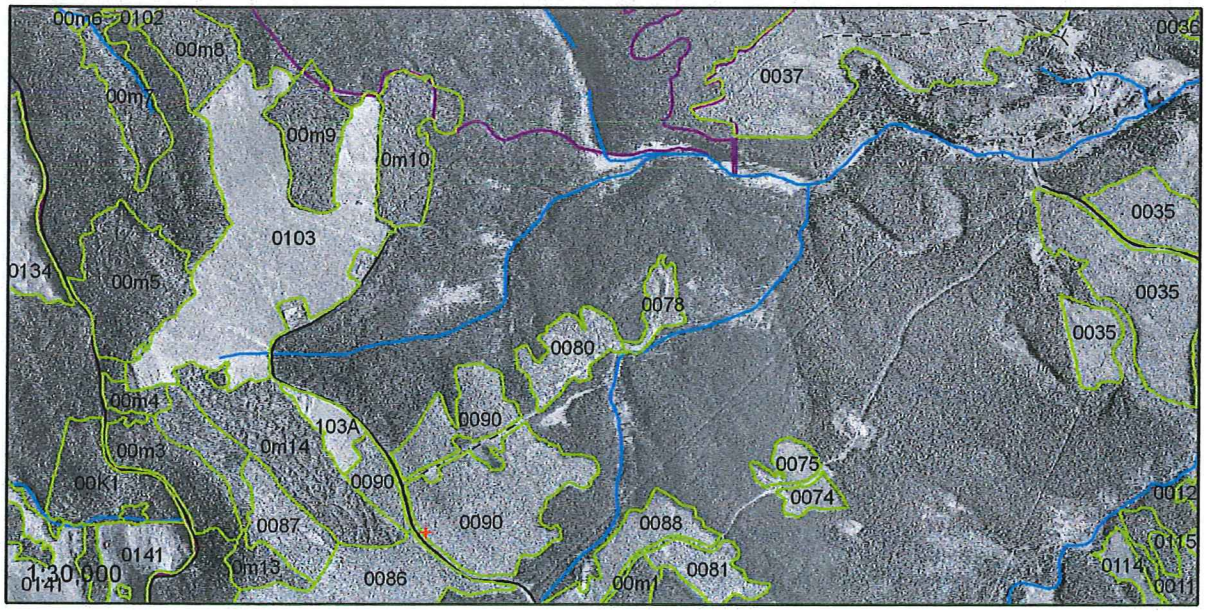


PPts Blk 24	
1	N 53 39.940 W 118 05.936

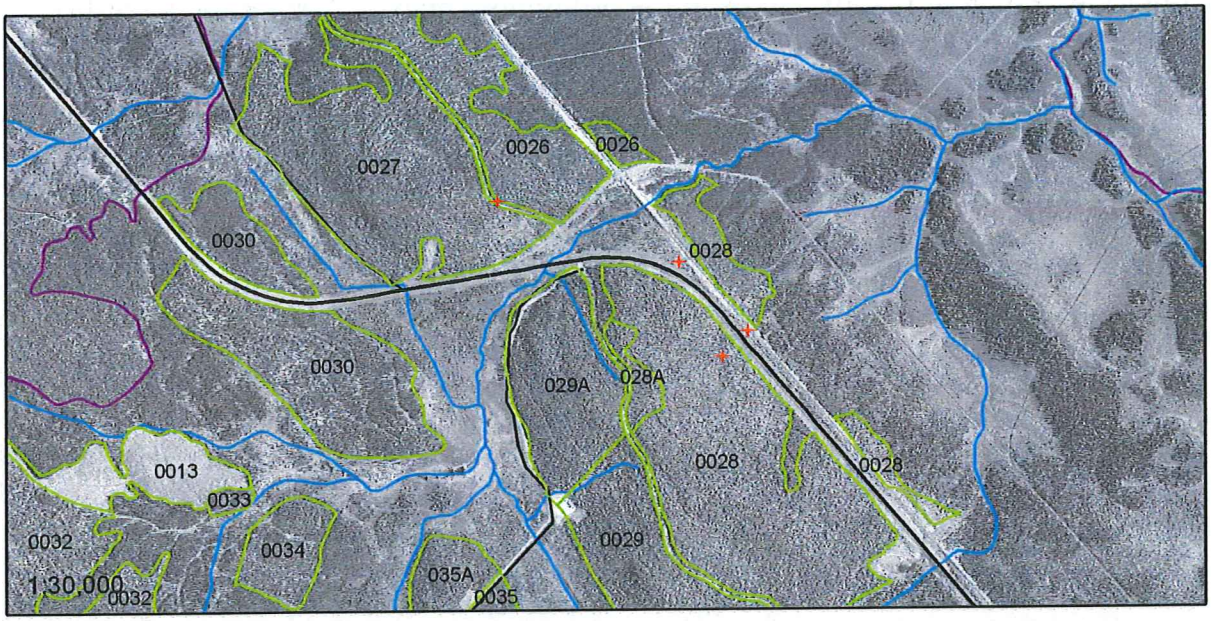
Map above at 1:60,000 to show extent of progressive clearcut

PPts Blk 90	
1	N 53 41.085 W 118 11.575

Block 90, Berland 5. Cut 1980.



Block 26, Berland 8. ("Zimmer Report" Block) Cut 1956.
Block 28, Berland 8. ("Zimmer Report" Block) Cut 1959.



PPts Blk 26	
1	N 53 36.436 W 118 05.009
2	N 53 36.297 W 118 04.413

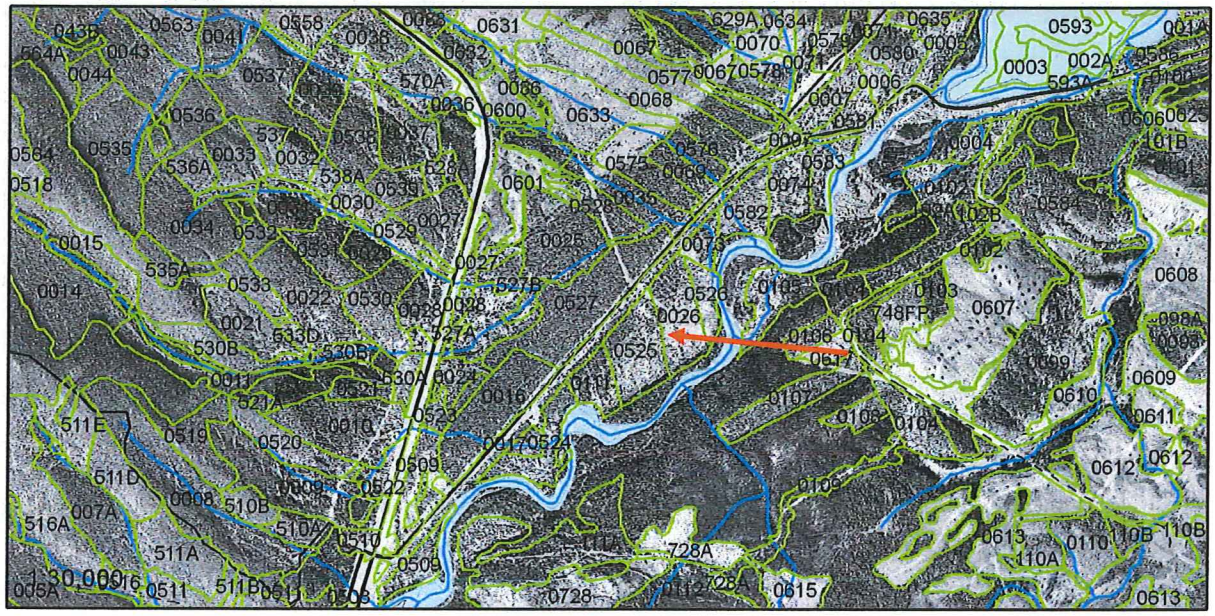
PPts Blk 28	
1	N 53 35.842 W 118 03.743
2	N 53 35.888 W 118 03.707

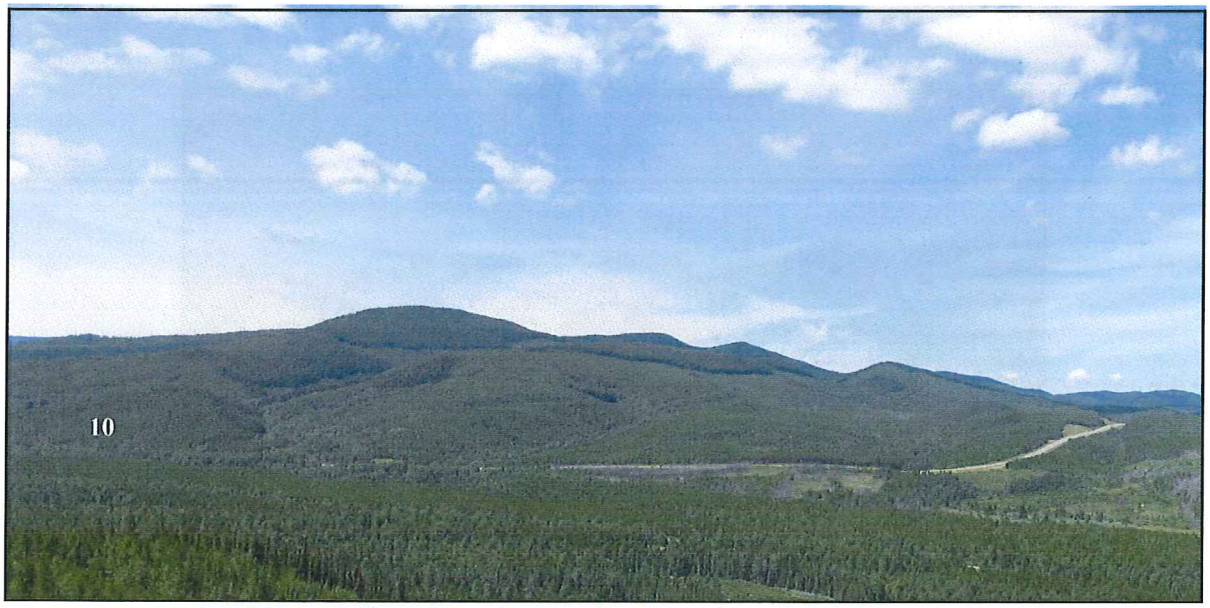
(below) Block 28, Aerial View 2006.

6. Landscape Image Maps

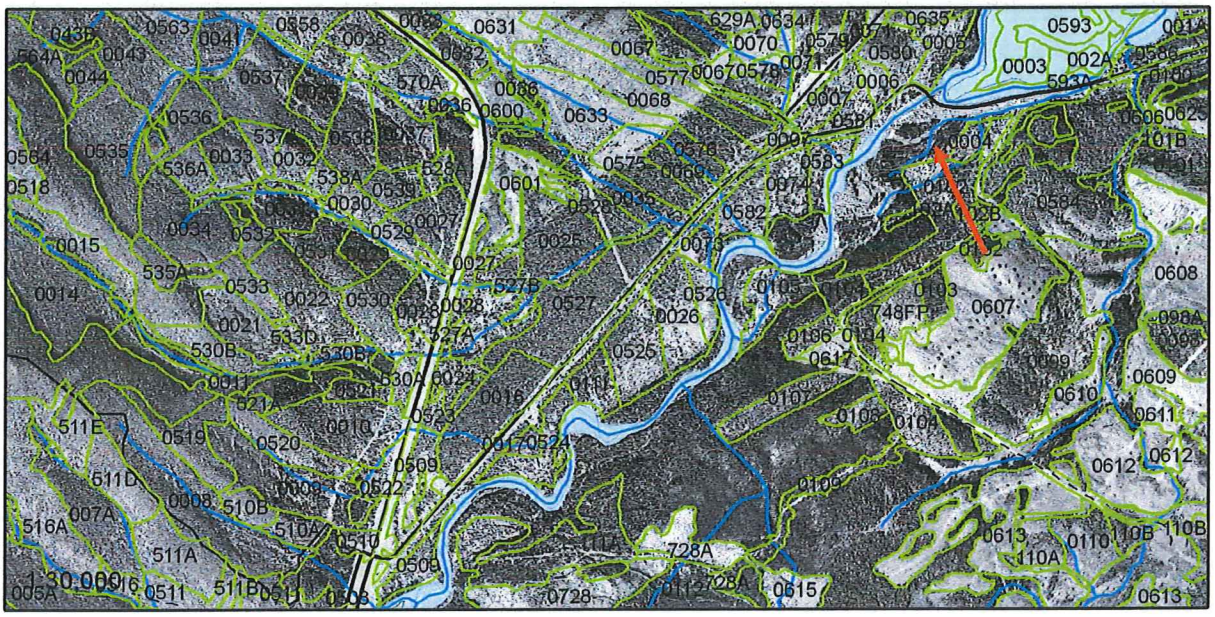
Selected landscape images are included where the helicopter position and locations are known or readily linked to the orthophoto maps. Arrows on the orthophoto show approximate location of helicopter and direction of photograph.

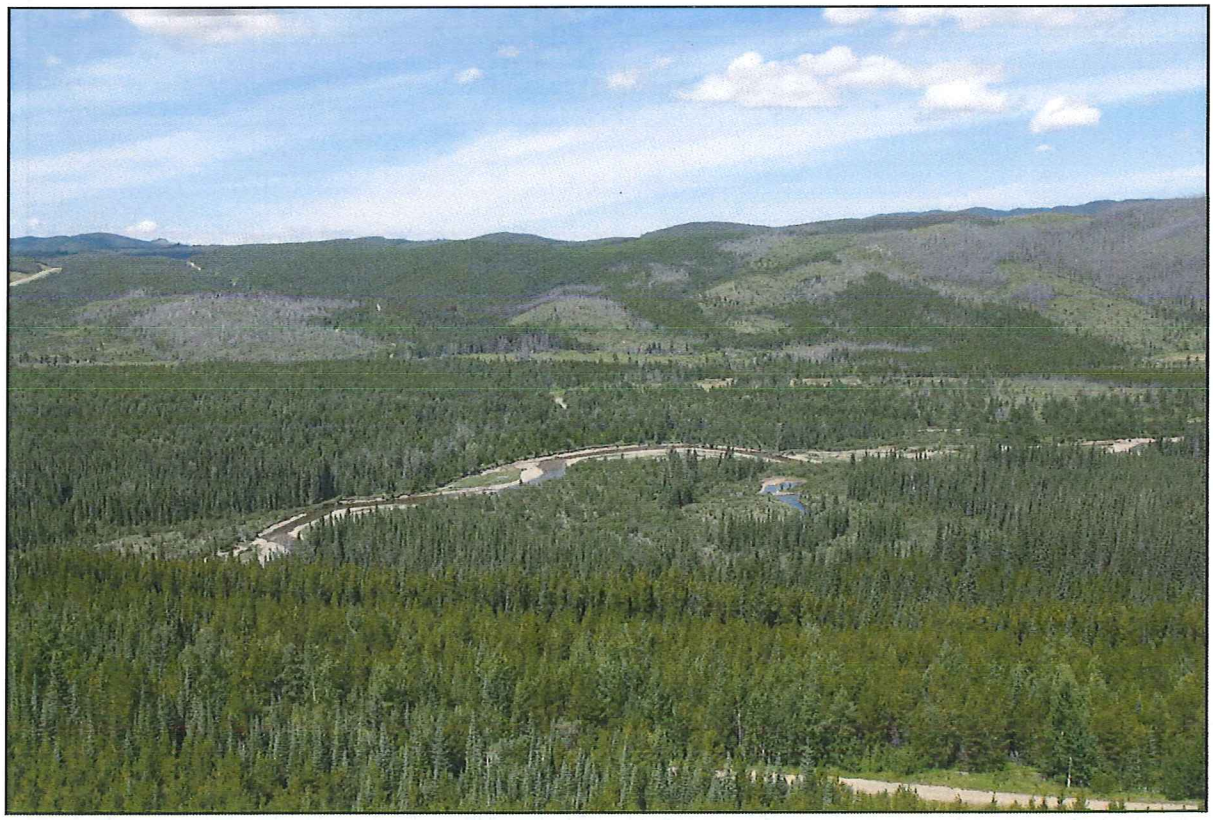
a. McLeod Working Circle, Compartment 2 - The Highway 40 Viewscape



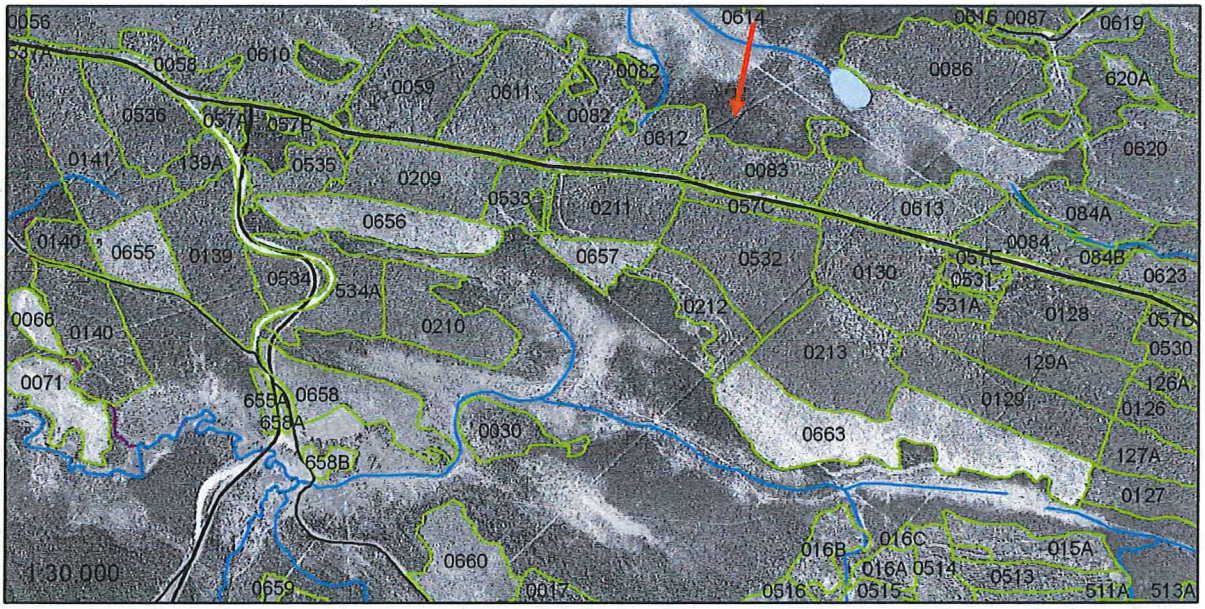


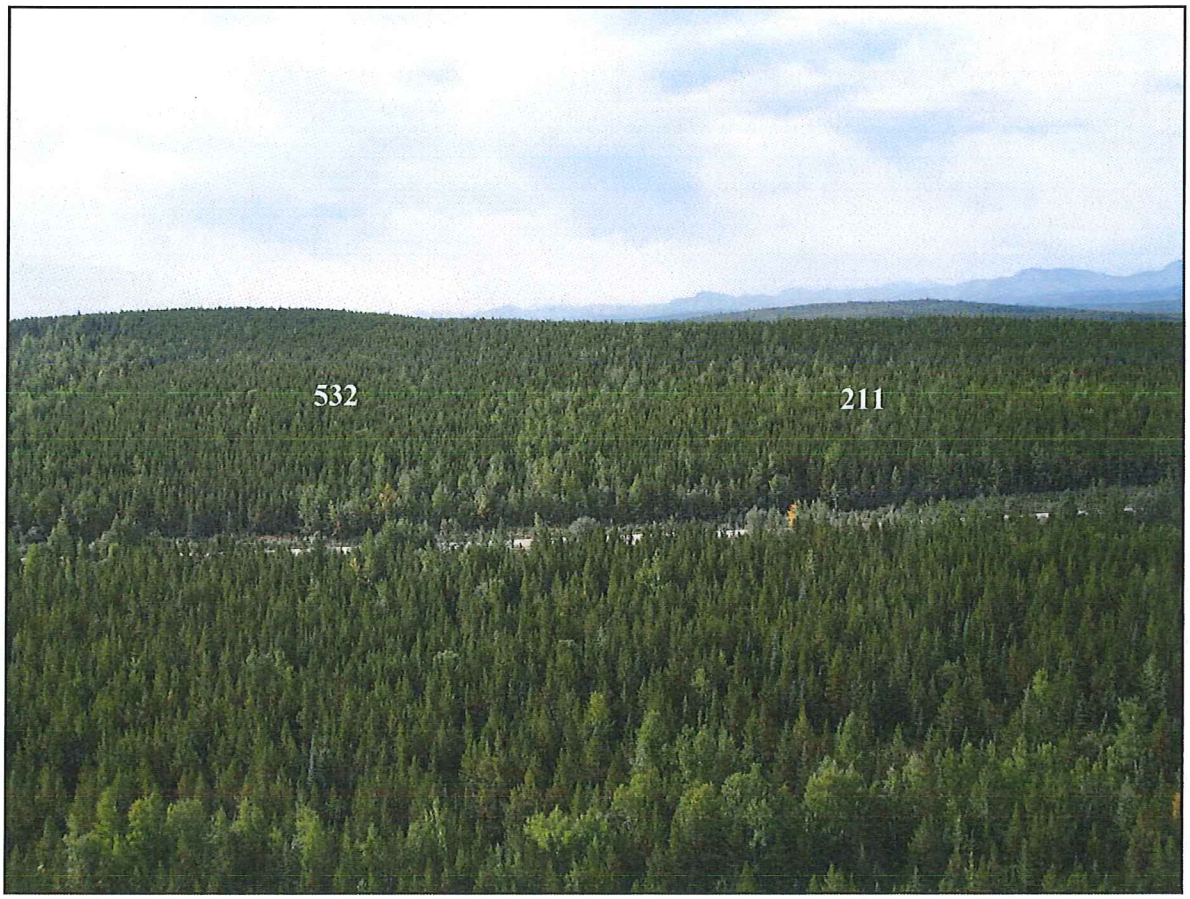
b. McLeod Working Circle, Compartment 2 - The Gregg Valley Viewscape



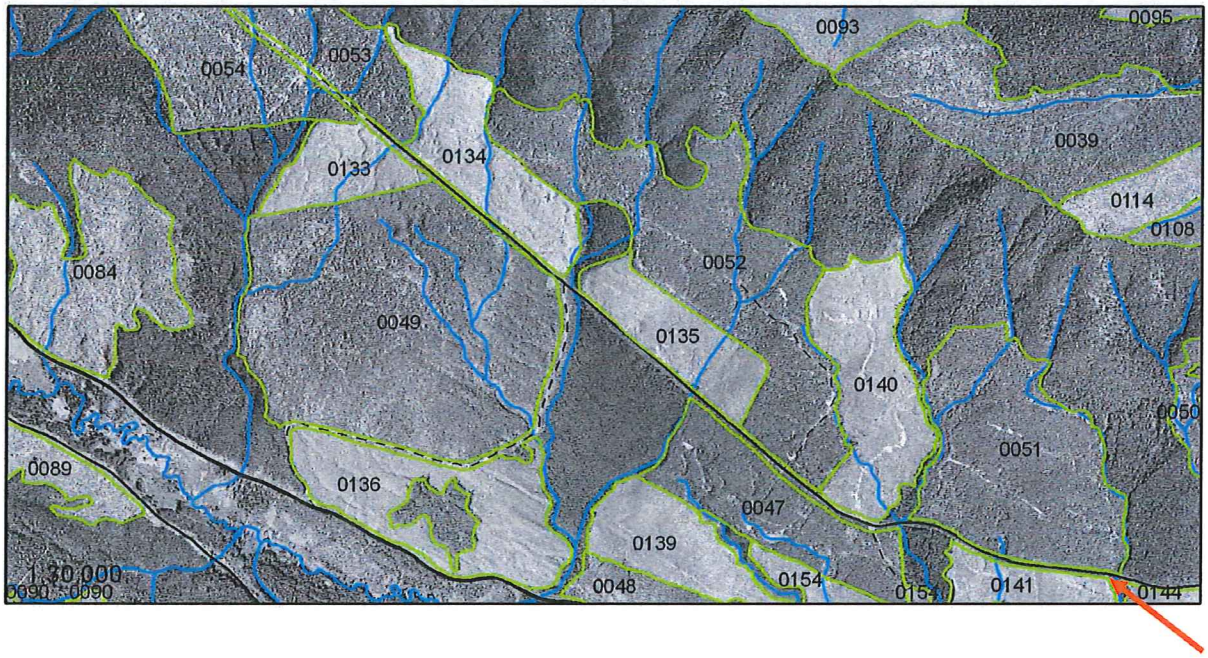


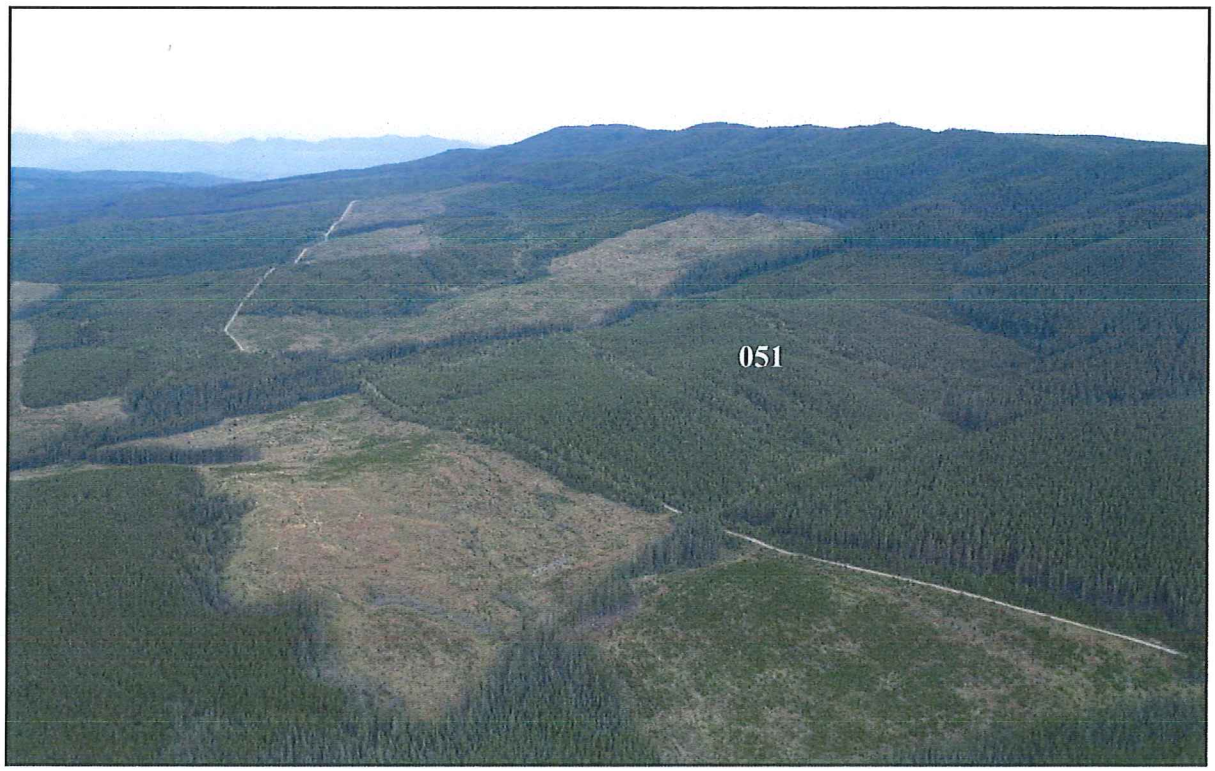
c. "Zimmer Report" Blocks, McLeod 6



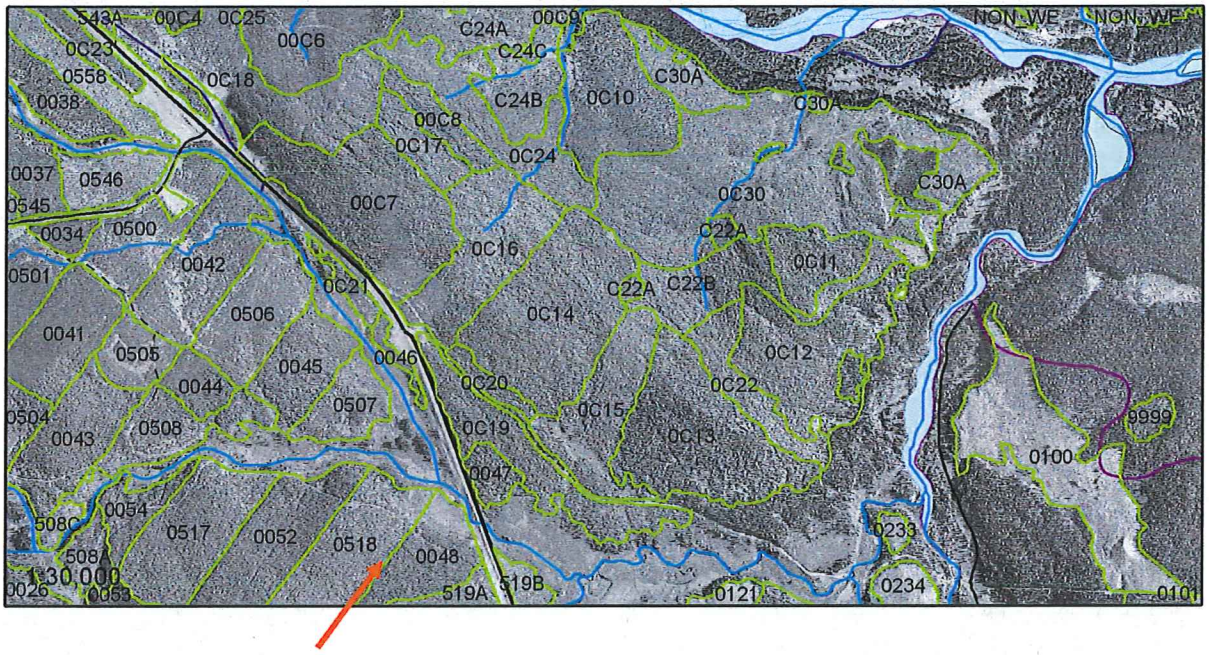


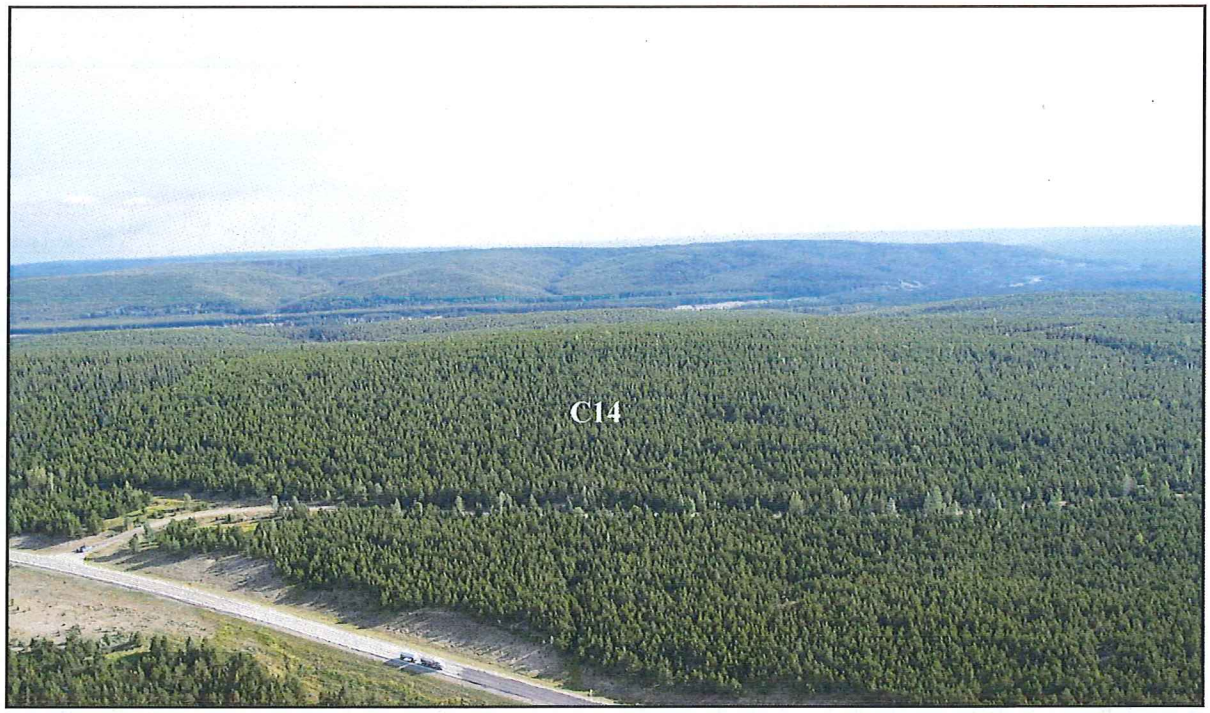
d. McLeod 7 just Below Bighorn Ridge





e. "Zimmer Report" C Series Blocks, Berland 3





f. Berland 5 Progressive Clearcut