

## **Appendix IX History**

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History is an important component of the Management Plan process. The sections below briefly summarise the significant changes in management regimes, important events and how Canfor performed both before and since acquiring TFL 37. This list is arranged according to management plan periods.

### Development of the Nimpkish Valley to 1960

#### **General Development**

- Prior to 1917 - Small amount of logging takes place near tidewater at Broughton Strait on the northern fringe of what would later become TFL 37.
- 1917 - Large scale timber harvesting begins when the Wood and English Logging Company introduced a railroad logging operation. W&E was a modern and efficient operation but economic conditions prevented the Company from undertaking the costly extension of the railway along the rugged shores of Nimpkish Lake. This company operated in the area for 24 years.
- Logs from the southern end of Nimpkish Lake are dumped, towed up the lake to its northern end, reloaded on rail cars, and hauled to tidewater at Beaver Cove where the log dump, called Englewood, was located.
- 1918 - 30-ton-per-day sulphate pulp mill is constructed adjacent to Beaver Cove. The venture proves uneconomical and closes down permanently after operating for only one year.
- 1925 - Wood and English Company runs a sawmill at Beaver Cove until 1941.
- 1942 - Canadian Forest Products acquires the timber rights from the Wood and English Company and begins logging operations in the Nimpkish Valley.
- 1957 - Canadian Forest Products constructs the railway connection along Nimpkish Lake to Beaver Cove, completing the railroad development begun by the Wood and English Company.
- The mainline railroad is extended southward to the Sutton Creek area where logs truck from the southern portion of the TFL and transfer logs to rail cars for the 100 km haul to tidewater.
- The southern terminus of the railroad is presently at the Vernon reload that is 11 km north of the old Sutton reload.
- Five logging communities, Beaver Cove, Atluck Camp, Nimpkish Camp, Woss Camp and Vernon Camp, are established to house the workforce and provide support services.

#### **Silviculture**

- Experimental planting and seedling studies started in 1947. Planting completed on areas with inadequate natural regeneration. Thinning trial established in young Fdc/Hw stand. Growth and yield plots established (EP 348). Fdc provenance trials established. Plus tree program implemented.
- 1954 - Large operational Fdc plantations established.
- 1959 - 10 year supply of Fdc seed collected.

#### **Protection**

- Severe attack on mature western white pine by the Mountain Pine Beetle (*Dendroctonus ponderosae* Hopk.).
- 1923 - In 1923 a lightning strike near Maquilla Creek burns 2,633 ha. Men and equipment from the Englewood Logging Division were called upon to fight the fire that was 16 km beyond the end of the railway.
- 1952 - Vernon camp is constructed in 1952 within the burn area and an accelerated salvage program commences.

- 1953 – Efforts begin to prevent damage to felled and bucked logs by Ambrosia beetles (*Trypodendron lineatum*) and (*Gnathotrichus spp.*) through inventory control and to discover an effective and environmentally safe population control method.
- 1953 – Douglas-fir beetle (*Dendroctonus pseudotsugae*) is responsible for significant damage to many mature Douglas-fir stands. Dead and dying Douglas-fir timber is successfully recovered before losses from decay develop.
- 1953 - An infestation of western blackheaded budworm (*Acleris gloverana*) threatens all of the stands in the northern part of the Nimpkish Valley. Canfor participates in a cooperative aerial spraying project organised by the Pest Control Committee of the Council of Forest Industries of British Columbia (COFI). The details and results of the program have been summarised by COFI, the Canadian Forestry Service, and The Canadian Fish Culturist.
- 1956 – Populations of the pine butterfly (*Neophasia spp.*) are monitored. While egg counts in some areas suggest the possibility of epidemic larvae populations, natural controls have prevented larvae build-ups. No extensive pine butterfly flight concentrations have been noted since 1974.

### **Working Plan # 1 – 1961 to 1965**

#### ***Silviculture***

- Broad objectives included fill plants on areas of inadequate natural regeneration, plant areas of high site quality immediately following completion of slashburning. Plantation survival averaged 70%.
- Regeneration surveys were completed 5 years after harvest or planting. All NSR tracked.
- Further plus tree selection and establishment of clone banks.

#### ***Protection***

- 1961 - Severe winds cause approximately 17,000 m<sup>3</sup> of timber to blow down. Harvesting plans were altered to salvage the windfall.
- 1962 - The most serious fire season in recent years occurs when 15 fires, resulting from escaped slash fires are pushed by unanticipated gale force winds. This affects 301 hectares. After these fires were extinguished, the fire-damaged timber was salvaged.
- 1965 - Canfor participates in a cooperative sampling program to determine the extent of the balsam wooly aphid (*Adelges piceae*) infestation on Vancouver Island. Collections of balsam (*Abies amabilis*) foliage are made at several locations throughout the Nimpkish Valley. No evidence of the aphid is found on any of the samples.
- 1965 - A survey of damage caused by the Sitka spruce weevil (*Pissodes strobi*), is conducted as part of a larger study initiated by the Pest Control Committee of COFI. Weevil damage was found to be heavy throughout TFL 37, except in the Beaver Cove area.

#### ***Inventory***

- 1962 - Timber & land inventory verified & updated.

### **Working Plan # 2 – 1966 to 1970**

#### ***Silviculture***

- Continued strategy to fill plant areas with inadequate stocking and plant area of high site quality. Increase in planting density to 1200 stems per hectare. Regeneration surveys completed 5 years after harvest/planting. Average survival 70%. All NSR tracked. Participated in Hw fertilisation Co-op trials.
- 1966 – 860 lbs. of Fdc seed collected from a range of elevations. Seedling cooler constructed in Woss (expanded to 300k trees in 1969).

- 1967 – Hw first planted operationally.
- 1969 – Fdc and Hw mix-planted operationally.

#### ***Protection***

- Canfor assists the Canadian Forestry Service in a reconnaissance mapping and sampling project for a western blackheaded budworm infestation in the Pinder peak area. Observations in 1974 indicate populations had dwindled below epidemic levels. There have been no infestations since.

#### ***Inventory***

- 1966 – Collection of stem analysis data. Timber & land inventory records updated.
- 1967 – Collection of stem analysis data. Permanent samples plots in stand improvement areas.
- 1968 – Stem analysis data taken from 143 trees.
- 1969 – G&Y – Nimpkish Land Classification Project.

#### ***Integrated Resource Management***

- 1969 – Winter and spring forage for deer in immature stands to inventory the spring forage availability in openings and immature stands and to survey young stands in areas which may be suitable for winter range management and evaluate the winter forage.

### **Working Plan # 3 – 1971 to 1975**

#### ***Silviculture***

- Shift in policy to reduce 5-year regeneration delay to target of 2.5 years. All NSR areas planted (first logged – first planted). Immediate planting of new cutblocks. Regeneration survey system changed. All logged settings classed as NSR and added to planting list. A detailed plantation assessment followed at years 1, 2 and 5. 70% plantation survival. Research efforts centred on direct seeding trials, planting stock types and species trials. Half-sib seedlings of mid – high elevation Fdc used to establish MoF Duncan seed orchard. Three elevation ranges established for Fdc. Maintenance of 10 year seed supply.
- 1971 – Canfor Sechelt seed orchard established.
- 1974 – Cw and Bn first planted operationally.
- 1975 – Cone collections of local Hw, Ba, Cw and Yc

#### ***Protection***

- 1972 – Ambrosia beetle populations are closely monitored in the area of the Beaver Cove dryland sort. Counts indicate that populations would approach epidemic levels in 1977. As a result of the 1979 experience, Dr. John Borden from Simon Fraser University, a specialist on ambrosia beetle control, conducts a study to develop an ambrosia control system.
- 1975 – Severe winds and heavy rains cause approximately 20,000 m<sup>3</sup> to blow down. Harvesting plans were altered to salvage the windfall.
- 1975 – Hemlock sawfly larvae (*Neopidprion tsugae* Midd.) damage is noted on balsam trees in the Schoen Creek drainage. The infested area is part of a larger infestation involving an area of approximately 5,000 ha lying between the Adam River drainage and Strathcona Park where light to moderate defoliation occurred. The Schoen Creek infestation was examined in 1979 and no increase was noted.

#### ***Inventory***

- 1972 – Tracing of planimetric base maps, inventory information transferred, final draft of new cover maps. Completed Fdc plus tree cruising program.

- 1975 – Computerised land & timber inventory designed. 6,500 ha immature forest stratified. 25,000 ha immature forest less than 30 years colour photographed, 3,000 ha classified into silviculture treatment units.

## **Working Plan # 4 – 1976 to 1980**

### ***General Development***

- 1978 - Following completion of the new Island Highway, all camps except Woss are eliminated. Today employees live at Woss or the outlying communities. Only repair shops remain at some of the former campsites. Beaver Cove is now the site of our dryland sort.

### ***Silviculture***

- Continued policy to reforest cutovers as soon as possible. 70% plantation survival. Regeneration delay average 2.5 years. Target set to reduce regeneration delay to 1 year by 1978. Use of 2+0, 2+1 bareroot stock, limited use of container seedlings. 10-year supply of Fdc seed obtained. Local provenances used in reforestation program. Seed not moved more than 150m in elevation from source.
- 1977 – began juvenile spacing program.
- 1978 – began aerial fertilisation program.

### ***Protection***

- 1978 - Severe damage to stored logs from Ambrosia beetles occurred during the spring and summer.
- 1979 - Severe winds cause approximately 250,000 m<sup>3</sup> of timber to blow down. Harvesting plans were altered to salvage the windfall.

### ***Inventory***

- 1978 - Computerised land & timber inventory designed, planimetric cover maps updated. 130 immature inventory plots established.
- 1979 - Computerised land & timber inventory completed, planimetric forest cover maps updated, compilation of re-inventory.
- 1980 - Intensive cruise of proposed Tsitika Ecological Reserve. Implemented program to evaluate growth & yield of treated second growth. Aerial photos of immature stands. CWHa (xm), CWHb (vm1), CWHi (vm2) and MHa (mm1) mapped. 90 ecological plots established, 8 ecosystem associations identified and grouped into 7 silviculture treatment units.

## **Management and Working Plan # 5 – 1981 to 1986**

### ***General Development***

- 1981 - A 98 ha Tsitika Ecological Reserve was created to protect features associated with the Tsitika area.

### ***Silviculture***

- Areas planted immediately following logging or site preparation. Application of ecosystem based system for site identification and species selection (biogeoclimatic ecosystem classification system). Implemented microsite selection in planting program. Planting densities averaged 800 stems per hectare, higher on difficult sites. Spring planting preferred. Stocktypes used were 1+0 mudpacks and 1+2 transplants. Target set to achieve a minimum of 80% plantation survival. Seed collections from natural stands supplemented with improved seed from seed orchards.
- 1981 – began pruning program.
- 1985 – began commercial thinning operations.

**Protection**

- 1981 - To minimise log damage from Ambrosia beetles, 35 pheromone-baited traps were placed in strategic locations at the Beaver Cove dryland sort to provide a long term trapping system. The number of traps was increased to 150 in 1984. Currently, there are over 200 traps and trap log bundles.
- 1981 - A survey of damage caused by the Sitka spruce weevil (*Pissodes strobi*), was conducted in the Beaver Cove area. Damage found to be minimal.

**Inventory**

- 1982 – Growth and yield - permanent sample plots established. Treatment units typed onto aerial photos.
- 1983 - Established temporary sample plots in immature timber. Collected data on root rot, dwarf mistletoe, wildlife & ecosystems. Treatment units typed from aerial photos transferred to 1:15,000 maps. Ecologically sensitive areas (ESAs) mapping project.
- 1984 - Updated and transferred land & timber files to microcomputers. Completed mature inventory. Surveyed immature inventory 5-20 year old stands. Volume/age data compared to MoF Volume/age curves. Sketch treatment units in CWHb1, CWHb2 & MHa on 1:20,000 photos. ID, transfer to 1:15,000 maps, rate ESAs.
- 1985 - Started to update immature inventory labels. Treatment units in CWHb1, CWHb2 & MHa sketched onto 1:15000 cover maps.
- 1986 – Correlated site index to silviculture treatment units to estimate productivity of stands in the windward CWHb1 (CWHvm1) biogeoclimatic variant.

**Integrated Resource Management**

- 1985 - Inoculation of lichen on Fdc seedlings and juveniles to determine the feasibility of lichen fragment transplants from old-growth colonies to 10 year old Douglas-fir juveniles using an artificial method of application.
- Opened intensive forestry demonstration trail at Hoomak Lake.
- 1986 - Study to treat and monitor two-second growth Douglas-fir stands as potential deer winter range.

**Management and Working Plan # 6 – 1987 to 1993****General Development**

- 1988 - A 17 ha Nimpkish River Ecological Reserve was established to protect unique features. This island supports one of the most productive stands in the CWH zone. Some Douglas-fir trees measure over 80 metres in height.

**Silviculture**

- Management Plan stated objectives: “to offset the potential reduction in AAC, the silviculture program will have 2 objectives.
- To fully regenerate each hectare immediately after logging and
- To maximise the merchantable yield and quality from each hectare in the new forest.”
- Basic silviculture obligations on all areas logged after October 1, 1987 are the responsibility of Licensees.
- Development of ecological treatment unit system. This was essentially a localised version of the Ministry of Forests biogeoclimatic system. Treatment units guided silviculture prescriptions and activities across the landbase.

- Good and medium sites planted immediately following harvest. Poor sites assessed for natural regeneration and fill planted where required. Survival target of 80% from previous period was met (average survival 84%). Target stocking 1100 stems per hectare. Regeneration delay 1 – 3 years.
- Research investigated the following topics: salal interactions and control, planting stock trials, distorted growth in Fdc, pruning methods and rust resistance in Pw.

### ***Inventory***

- Management Plan stated objective to construct local managed stand yield tables for each major treatment unit.
- 1987 – Immature inventory: 160 plots located in CWb2, permanent sample plots at mile 10 re-measured. Stem analysis of older Fdc and Hw beyond 80 years to validate site index curves.
- 1988 – Immature inventory: 40 plots located within CWHb1, 7 permanent sample plots re-measured. Stem analysis in Fdc stands. Treatment units revised in CWHa1. Calculated broad inventory type data. Digitised inventory maps. Calculated site index Fdc & Hw. Prepared volume/age curves for natural regeneration of Fdc and Hw.
- 1989 – Inventory of 400 ha of immature timber. Calculated broad inventory data. Stem mapping of Fdc to determine growth rate. Determine average site index. Prepared volume/age curves for natural regeneration and planted stands. Transfer of treatment units and ESA maps to GIS.
- 1990 – Calculated broad inventory type data supplemented by historic data.
- 1991 - ESA work for soils in Kilpala & Upper Schoen drainage.
- 1992 – Started to produce orthophotos.
- 1993 - Final production of orthophotos. Completed a 1:5,000 operational mapping project of Noomas Cr. Drainage. Began to develop strategy to integrate growth and yield information with Timber Supply Review. Mapped Gold Creek, Swah Creek and Club Creek drainages for terrain stability.

### ***Integrated Resource Management***

- A full time Habitat Forester position was implemented to oversee habitat management and research on TFL 37.
- 1987 – Aerial and ground application of forage lichen to test and compare aerial and ground application techniques and to evaluate lichen abundance before and after the application.
- Winter Range Inventory and Assessment to:
  - Compile an inventory of deer and elk winter range habitat on TFL 37 and FL A19233.
  - Assess deer and elk winter range capabilities.
  - Assess the capabilities of otherwise "undesigned" mature forests as deer and elk winter range.
  - Integrate "winter range capable areas" with other forest management goals.
  - Produce a plan to manage deer winter range for the next 30 years.
- 1988 – Habitat assessment and planning with MoF to:
  - Assess the habitat requirements of Black-tailed deer during winter on TFL 37.
  - Test the fidelity of deer to old growth winter range.
  - Test the "Nanaimo Lakes Model", of three different deer migratory habits, in the Nimpkish Valley.
  - Develop a watershed based planning tool to assess habitat availability and requirements.

- Managed stands for deer winter range research to
  - Investigate browse availability and micro climate conditions in various second growth stands.
  - Equate these conditions to deer winter range requirements.
  - Produce a model that will assist forest managers in forecasting the effect of second-growth stand manipulations on winter range capability.
- Vancouver Island Fawn Tagging Project to monitor dispersal and habitat selection patterns of fawns in cooperation with an island wide program of the Ministry of Environment.
- 1989 – Eagle Nest Survey to create and map a complete inventory of eagle nests and to design protection strategies for eagle nesting sites where they conflict with other forest resources.
- Began an upgrading program for all ten companies maintained campsites on the TFL.
- 1990 – Initiated forest tour program for north island grade 5 students.
- 1992 – Research project was initiated to determine the best and most practical method for enhancing or supplementing habitat within second growth forests for cavity dependent bird species. This included “planting” of artificial snags in cutover areas.
- 1993 – Developed two forest interpretation trails (Upper Klaklakama and Siding 4).
- Initiated a research project on woodpeckers nesting habitat.

## **Management and Working Plan # 7 – 1994 to current**

### ***General Development***

- Acquired skyline logging equipment to assist in logging log our timber profile.
- Reduced the amount of road-related site degradation through skyline logging and by rehabilitating spur roads.
- 1991 – Canfor participated in CORE process towards development of VILUP and eventually, VIRT.
- 1995 – Canfor became actively involved with Mount Waddington Regional District Community Resource Board.

### ***Silviculture***

- Management Plan set stocking standards by Canfor treatment unit and corresponding biogeoclimatic site series. Target stocking generally 1100 stems per hectare. All areas planted immediately following harvest.
- Annual regeneration surveys and plantation assessments completed.
- Implemented an electronic database for planning and tracking silviculture activities.
- Full rehabilitation and planting of redundant spur roads.
- Development of managed stand yield curves for each site series on TFL 37 employing site index estimates resulting from SIBEC project.
- Operational use of various browse protection devices.
- Operational use of time of planting fertilisers.
- Research topics included: realised gain trials for genetically improved Hw, time of planting fertilisation, various types of browse protection, fertilised seedling mats, and seedling productivity on rehabilitated roads.

### ***Inventory***



- 1994 - Acquired 1:15,000 colour photos of TFL & controlled to TRIM. Explored alternatives to acquire 1:15,000 digital base maps. Preliminary work to develop SIBEC correlations. Develop plan to acquire level 2, terrain stability mapping.
- 1996 - Began to update forest inventory data. Began base-mapping project. Development of 1:5000 scale base maps with 5 metre contours. Began to develop site series & terrain stability mapping. Preliminary inventory of slides and gullies. Draft proposal to develop SIBEC (a project which will correlate site index with ecological mapping).
- 1997 – Ministry of Forests accepted SMOOP for Management Plan 8. Completed TFL forest re-inventory. Developed preliminary ecological and terrain mapping. This coverage was used to correlate site productivity estimates with the site series designation and Timber Supply Analysis. Completed SIBEC project titled Developing Site Index Estimates for Major Tree Species of the Site Series Map Units for TFL #37.

#### ***Integrated Resource Management***

- 1995 – Initiated a 3 year project to inventory and map locations of owls on TFL 37.
- Began an enhancement program for violet-green swallows, a predator of ambrosia beetles at Beaver Cove dryland sort.
- Installed 5 western screech owl and northern saw-whet owl nest boxes in 50 year old second growth stands to enhance nesting opportunities.
- 1996 – Initiated a 3 year project on habitat requirements and feeding activity of bats.

**Table 1 Basic Silviculture Summary 1954 to 1997**

Year	Cubic Metres	Logged Area (ha)	Seed Purchased (kg)	Cones Collected (hl)	Roadside Pile & Burn (ha)	Mechanical Site Prep (ha)	Broadcast Burn (ha)	Trees Planted (#)	Area Planted (ha)	Area Brushed (ha)	Planting Assessed (ha)	Regen Assessed (ha)	NSR Area (ha)	Free Grow Assessed (ha)
1954								148,000	171					
1955								291,500	359					
1956								93,800	96					
1957								200,000	204					
1958								407,300	501					
1959								503,500	578					
1960								593,500	684					
1961	654,940	819					127	483,000	567			447		
1962	729,248	912						587,500	704			1,031		
1963	653,878	817						640,200	651			1,520		
1964	672,402	841						705,000	788					
1965	643,776	805	650 gr. Pw for experiment			158	765	928,000	1,011	32		4,374		
1966	581,653	820		1640 bush		30	482	1,003,700	1,204			919		
1967	585,168	825				10	961	738,500	813			1,824	5,149	
1968	778,421	1,027		70 lbs.				1,229,000	1,122	43		1,226		
1969	745,431	903						1,036,000	947	77		221		
1970	905,827	1,132						1,182,500	1,115	182				
1971	1,111,042	1,095				9		1,273,500	1,095	92	5,793	696	4,103	
1972	926,545	1,079		3 3/4 bush		255.0 plan, part comp		1,466,600	1,302	15 miles	2,815	122	3,950	
1973	1,241,781	1,224				815.4 plan part comp		1,416,860	1,213	30 miles	2,434	169	3,180	
1974	987,836	1,314					1,185	956,700	922	130 miles	1,729	67	3,064	
1975	932,954	1,187		25.3 bush			315	1,537,375	1,387	81 miles	826		2,956	
1976	1,447,656	1,527		34			2,156	1,519,305	1,471	82 miles	1,536	588	3,052	
1977	1,139,433	1,473					1,683	1,990,340	1,981		1,940	806	2,798	
1978	1,290,268	1,376					55	1,230,839	1,223		3,401		2,200	
1979	1,201,378	1,291	44	68	3	5	1,461	930,388	1,267		3,798		5,001	
1980	1,243,979	1,306			251	19	506	1,044,650	1,398	18	3,152		2,246	
1981	989,848	1,140			74	3	466	1,338,760	1,664	8	2,063		1,961	
1982	1,250,693	1,327		123	32	42	781	1,076,945	1,318		3,554		1,303	
1983	1,269,708	1,358		223	373	63	592	1,086,436	1,237	64	1,472		1,690	
1984	1,301,879	1,529		34	34	106	586	1,202,187	1,417	780	1,755		1,687	
1985	1,064,722	1,231		9	129	144	474	974,980	1,054	660	2,993		2,264	
1986	957,142	1,075			84	140	509	758,674	989	232	2,407		3,568	
1987	1,277,493	1,427				406	507	1,773,491	2,161	450	378	944	2,836	
1988	1,088,486	1,266		54		190	84	1,224,180	1,382	403	336	946	2,659	
1989	1,117,732	1,191	126			85	262	1,172,055	1,414	305			1,923	
1990	892,891	1,058		41	328	97		783,696	1,025	317	1,179		2,148	
1991	921,666	1,041	143		536	236	48	1,209,096	1,025	101		1,240	981	
1992	984,882	1,063	47		577	40		1,360,993	1,468	231		3,262	2,038	1,577
1993	931,341	1,090	3	197	1,065	46		1,062,555	1,182	76		2,202	2,292	1,245
1994	1,247,978	1,450	8		84	36		1,398,380	1,487	116		1,204	2,393	3,673
1995	1,145,316	1,450	5	19	32			1,608,847	1,737			3,020	4,793	1,319
1996	1,010,359	1,120	34	146	26			1,406,801	1,546	20		3,087	1,877	464
1997	966,091	1,150	12		32			1,518,568	1,423	19		1,724		1,696
<b>Totals</b>	<b>36,891,843</b>	<b>42,738</b>	<b>421</b>	<b>913</b>	<b>3,659</b>	<b>1,864</b>	<b>14,006</b>	<b>45,094,201</b>	<b>48,302</b>	<b>4,226</b>	<b>43,562</b>	<b>31,639</b>	<b>9,974</b>	

**Table 2 Incremental Silviculture Summary 1954 to 1997**

Year	Juvenile Space (ha)	Prune (ha)	Fertilise (ha)	Commercial Thinning (m <sup>3</sup> )	Commercial Thinning (ha)	Residual Falling (ha)	Site Conversion (ha)	Conifer Release (ha)
1970								
1971							92	
1972								
1973								
1974								
1975								
1976								
1977	9							
1978	42		15					
1979	168		383					
1980	842		740		15			42
1981	983	20	965				40	72
1982	1,726	65	1,465				13	103
1983	937	112	687				139	51
1984	400	262					50	
1985	389	139		724	8		45	
1986	361	78		721	4		27	
1987	520	53						62
1988	280	48	60	1,110	9	740		
1989	409	49	184	7,986	55	606	6	
1990	408	46	1,515	5,301	35	526	8	
1991	1,177	43		11,902	74	494		
1992	148	13	135	8,567	80	275		
1993	312	9		8,567	108			
1994	672	127	619	12,800	89	340		
1995	530	160	323	12,228	7			
1996	160	13	305	6,386	37	400		
1997	363	191	319	9,099	56			
Totals	10,836	1,428	7,715	85,391	648	3,381	420	