

THE USE OF A WHEELED LOADER AS AN EXTRACTION MACHINE

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INTRODUCTION

Gilsenan Logging has two logging contracts in North Canterbury, one a sawlog contract with the N.Z. Forest Service in Ashley Forest, and the other a chip log contract for Canterbury Timber Products (CTP) in Eyrewell Forest.

The Gilsenan family has a long history of logging experience and I first entered into the industry by working for my father on the West Coast. He had a cable machine and was ground hauling and high leading in the native there. In 1968, I moved to Nelson to work for Bob Hunt who was logging windthrow in Golden Downs Forest. By October 1968, I had my own contract with the Forest Service, logging steeper country in the Downs with a double drum winch on a D8 Cat. When the windthrow logging was completed, I secured a contract with Nelson Pine Forests producing chip-logs from exotics and later from native timber (oops sorry, naughty word!).

In May of 1975, I won a contract with the Forest Service to log sawlogs in the Canterbury Conservancy, starting in October. Unfortunately in August 1975, the Canterbury Forests were blown over so by September we had moved to Rangiora and started work in the windblow in Ashley Forest. At that stage we were using a 668 Clark and a Michigan 55 loader. About the middle of October I moved our second 668 Clark and Michigan 55 into Ashley and if that wasn't enough, I had a third Michigan loading export logs onto the railway wagons at Kiapoi.

The company brought out another contractor in 1976 which gave us access to the new CTP fibre board plant. Later in the year our crews were moved from Ashley to Eyrewell Forest to assist with the clean-up there. During this period we staked two tyres on one of the skidders almost simultaneously and discovered that there were no replacements available in the country. As the ground was flat and the ground conditions firm, we started experimenting with using the loader for extraction purposes.

BACKGROUND

Very quickly we realised that in our situation, using the loader as an extraction machine had enormous potential, however we did have to employ a slightly different system. The first logical

step was to grab the tree from the side rather than pull it from the butt. We were able to move a dozer into the area and open up a strip about 50 m wide along the side of the windthrown trees because the trees were reasonably short (15 - 18 m), and only 25 - 30 cm in diameter, there was very little broken wood in the block. Once the strip had been opened up, we lifted the trees out with the loader and lay them on the cleared area with all the butts aligned at right angles to the block.

At this stage of the operation it became obvious that we were better to leave the roots on the stem and lift the whole tree out. Generally most of the dirt and gravel was shaken off the butts during extraction but a solid thump onto the ground when laying them out usually finished the job. The crosscutters then had a relatively clean butt to cut off. We found that kickback was almost eliminated and jammed saws were less frequent because there was virtually no tension in the trees. The loader would work a run of three trees wide and anything from 200 to 300 m long, just picking the logs up and turning them perpendicular to the face, a distance of 10 - 20 m. At the end of each strip the loader would come back and stockpile the logs behind the crosscutters. It could handle sufficient trees in the 300 m run to occupy the crosscutters while trucks were loaded and the processed logs stockpiled.

Within a week production had doubled and we had eliminated the skidder. We did, however, have to increase the dozer involvement, pushing the slash away and filling in the holes left by root plates. This left a good flat surface for the next run with the loader. The ground conditions at Eyrewell were excellent for this type of extraction and because we were covering the area twice as quick and leaving behind us a clean cutover, we were able to take the trucks right in to the stockpiles. These stockpiles were no more than four loads each. The crew size at that time was :

- 1 Loader Driver
- 1 Dozer Operator
- 3 Crosscutters

Production was between 250 and 280 tonnes per day. Later on we added an extra crosscutter and another loader, just to fleet and load trucks. This increased daily production to 375 tonnes (average) per day. The clay and gravel type soils at Eyrewell were good to work on although they tended to dissolve into dust in the hot windy conditions, and would bog up if we got too much rain. With the dusty conditions chainsaw costs went up due to increased bar and chain wear.

SYSTEM DESCRIPTION

Currently we are clearfelling "catch crop" strips in Eyrewell Forest, contracted to CTP. We produce upwards of 22,000 m³ per annum of small 18 year old radiata. We have had to log this small wood to a set pattern because of the wind problems at Canterbury, i.e. the predominant N.W. winds and the susceptibility of the stands to windthrow. After the major windthrow earlier on, the "catch crop" was planted in strips

approximately 300 - 320 m wide. When it came to logging them, the Forest Service decided to log half the strip (about 160 m) at a time to afford protection to the young trees. We usually open the strip on the S.E. face, about 5 - 6 rows wide with landings about 300 m apart (refer fig. 1).

System Layout for Loader Extraction.

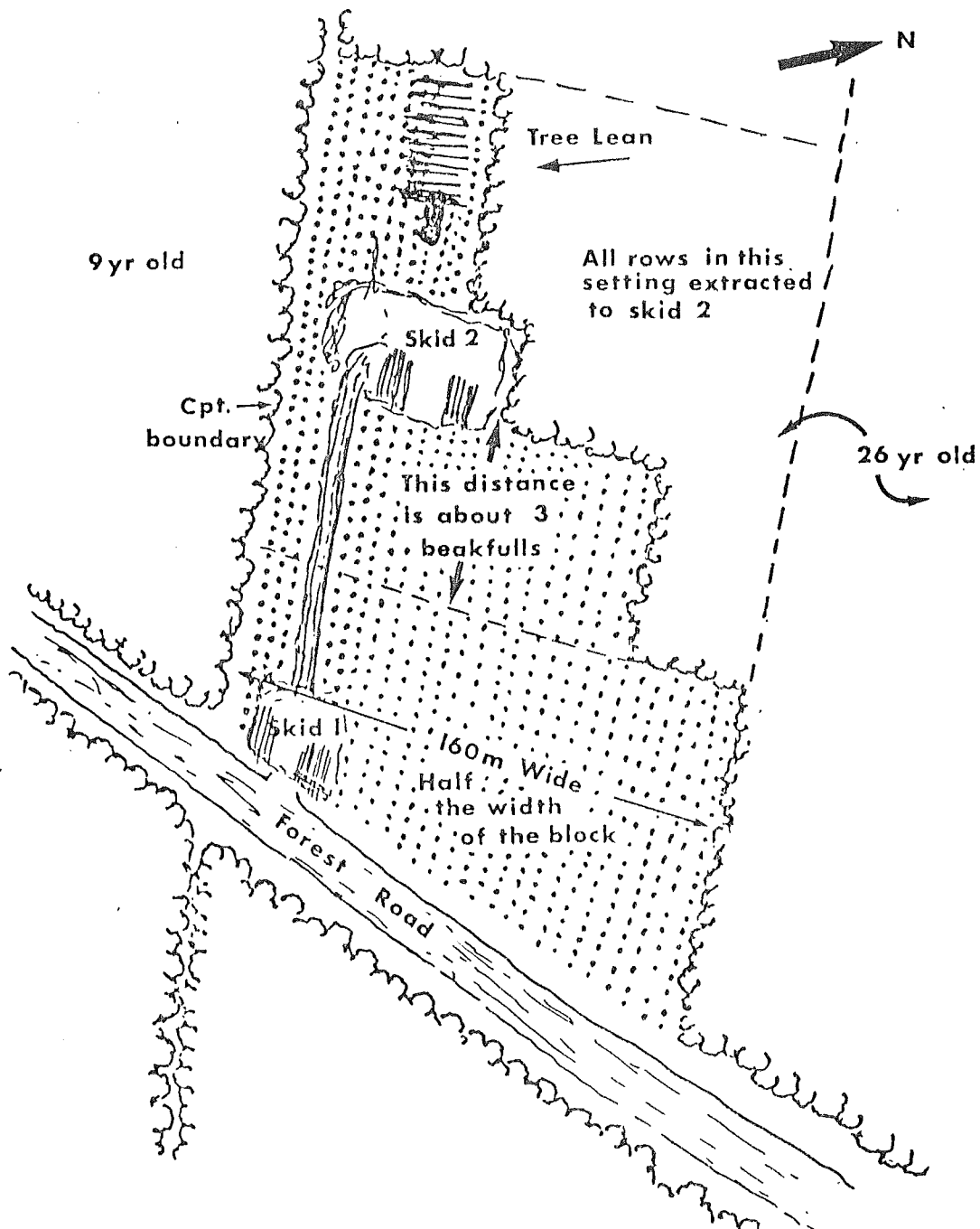


FIGURE 1

The crew size is : 1 Loader Driver
4 Fallers and delimiters (they alternate jobs)
1 Skiddy

Once the area is opened up, we fell the trees, one row at a time out to about 150 m (half the distance between landings). The faller drops the trees parallel, then the three delimiters work behind him each delimiting a third of every tree felled in the row. This minimises the walking the delimiters have to do between trees and generates a team atmosphere which is healthy in terms of productivity. In most stands the trees have not been pruned and therefore there are limbs from the ground up.

As the faller and delimiters progress down the row, the loader moves in behind them and picks up a beakful of logs (about 20 trees) equating to 4 - 5 tonnes. It takes the machine about one to two minutes to collect a beakful and back out to the landing.

At the landing the logs are spread out on bed logs for the skiddy to give them a final trim before they are fleeted. When fleeting the loader operator tries to align 50% of the logs in a stack with all the small ends flush, and the rest in another stack with the butts flush (see fig. 2). This pattern makes for quicker, easier loading (about four to five minutes turn around time per truck). All short logs are stacked in a separate heap.

The loader is a 112 kw Furukawa FL230 fitted with a Malcom head. To make the machine suitable for bush work we have installed underbody guarding, fitted a protective guard around the radiator and relocated both the air conditioning unit and the lights.

PRODUCTIVITY

The productivity of loader extraction depends to a large degree on ground conditions and piece size. While steep slopes would certainly be a limiting factor, we have worked on gently rolling country up to 15° with no loss of traction or production. In Eyrewell Forest an unexpected constraint has been the patches of old windrows scattered through most stands. It is sometimes necessary to physically remove the old logs to maintain production. The areas being logged are normally 15 - 18 year old p. radiata with an average piece size of about .20 m³. We are currently working in a piece size of .15 m³, stocked at 1124 stems per hectare.

The average production in this situation is around 108 tonnes per day, using the previously described extraction system. In larger wood, say .35 m³ daily production increases to 160 tonnes average but perhaps our best result has been in Medbury (Balmoral Forest) where we achieved over 200 tonnes per day with one loader. Due to the many varying factors in logging it is difficult to directly compare the costs of my loader extraction against a conventional skidder, but be assured it must be competitive, otherwise I wouldn't be doing it.

Organisation of Landing.

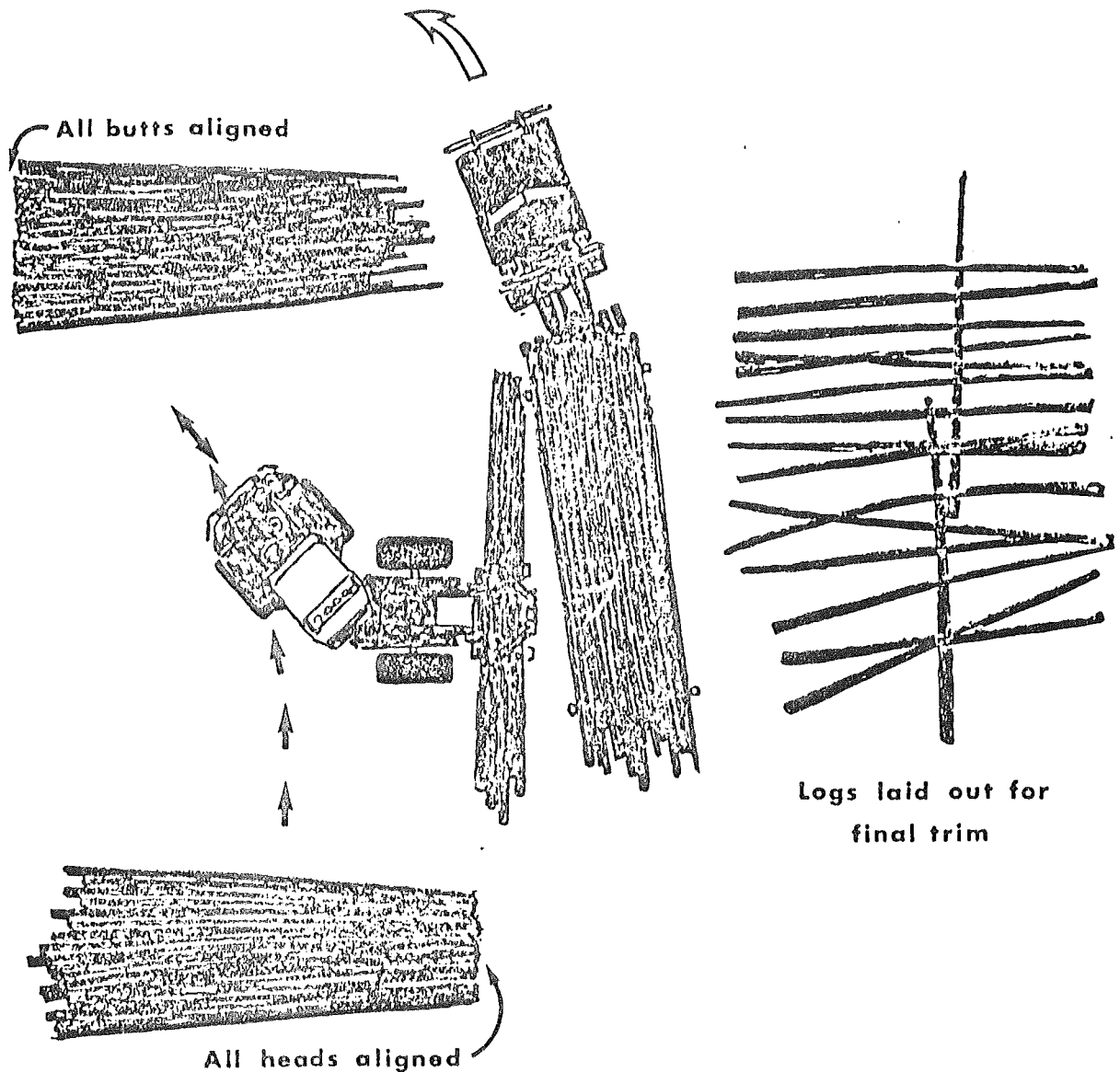


FIGURE 2

DISCUSSION

The advantages of having one machine to carry out all the extraction, fleeting and loading in a logging operation has distinct advantages. Obviously the biggest advantage is that you only have one machine and therefore only one capital commitment to meet, only one lot of repairs and maintenance bills to pay, and you have a machine that is fully utilised. I find that my faller and delimiters are working continuously without being too hard pressed, unless one man is away. On the other hand, if the loader breaks down, you have no production because the fallers can't get two or three days ahead unless they move around to different blocks, and there is no way of extracting or loading

unless we crank the old dozer up. Repairs and maintenance to date, however, has been pretty minimal, except for a design fault in the front end of the loader. All credit to Furukawa though because they replaced the whole front.

Would this system work in other situations? I see no reason why loader extraction couldn't be used in flat to rolling country where clearfelling of minor species, or young radiata, is taking place. For example, the potential of loading out p. ponderosa onto staked out trailers in southern Kaingaroa must be great. The next step, from my point of view, would have to be the mechanisation of the delimiting and probably the felling. With the right conditions, that could significantly increase production.

In its existing form, loader extraction would not be suitable for thinnings, but fear not, I have floating around in the back of my mind an idea that might just work, so don't give up hope, I may be standing up at another LIRA seminar in a couple of years time telling you about using a loader to extract tree length in thinnings.