

MEETING THE CHALLENGE: HIGHLEAD TO SKYLINE

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INTRODUCTION

When we were given the brief for this paper, "Meeting the Challenge: Highlead to Skyline", we pondered on it for a while. The challenge is there all right, but on careful thought, we found that the challenges facing us in moving to more complex haul systems are symptomatic of the challenges that face the whole logging industry.

Before explicitly identifying these challenges, we need to develop a background to logging in Nelson District. To do this, we will touch on:

- The physical and topographical characteristics of the district.
- Current logging practices.
- Future planning requirements.

This then sets the scene in terms of defining the nature and scale of challenges facing Nelson District in moving to skyline logging, and how these mirror challenges that face logging in general.

DISTRICT TOPOGRAPHY AND CHARACTERISTICS

Nelson district comprises some 83,000 hectares, of which some 63,000 hectares is in exotic

production forest. A large proportion (70%) of this productive area is on moderate to steep (more than 25°) terrain, that will have to be hauler logged.

The unproductive area of 20,000 hectares contains areas of native vegetation which are concentrated in the gully and valley systems within the exotic production forest. Many of these native areas have covenants in favour of the Department of Conservation. This will limit production in some areas, and increase logging costs.

In general, the exotic forests are characterised by relatively straight trees, with small branches and small average piece sizes. The piece sizes range from 0.5m<sup>3</sup> to 1.8m<sup>3</sup>, and stockings between 200 - 1200 stems per hectare.

The district can be separated into the following forests, and a brief description is given of each.

Golden Downs Forest

Stable moutere gravel soils, on long moderate slopes. Approximately 60% hauler terrain.

Rai/Hira

Predominantly stable schists on very long, steep slopes. Approximately 90% hauler.

Motueka Forest

Very erodable granite soils, on short, steep, and broken slopes. Approximately 95% hauler.

Waimea Forest

Stable schists, on long very steep slopes. Approximately 90% hauler.

Wairau Forest

Stable schists and erodable greywackes, on long moderate to steep broken slopes. Approximately 80% hauler.

Queen Charlotte Forest

Erodable stoney loams, on very steep long slopes. Approximately 95% hauler.

To date, logging has been on the easier, more stable soils in Golden Downs and Rai. Logging will remain in these areas, but some of the expansion in the next few years will come in the steeper, erodable soils in Motueka, and later again in Queen Charlotte forest.

CURRENT PRACTICES IN NELSON

Ridge top roading is a dominant feature in Golden Downs, due to the fact that the Motueka River runs through the centre of the forest, with its tributaries splitting the forest into major ridges and valleys running North-South. Major ridges and spurs in Golden Downs are broad and easily roaded.

Landing sizes for haulers are between 50m x 50m to 60m x 60m. A relatively large landing size is required to allow for the large number of log sorts, but more critically, to give log storage capacity. The matching of trucking with log production is a problem, and at present there is a need to have some log storage capacity on skid.

The areas currently being logged in Golden Downs and Rai have long even slopes suited to highlead logging. As covered in the first section, the topography and geology of areas to be logged will change, and then there will be increasing pressure to move from highlead to skyline systems. The latter will become the preferred method of logging in many areas.

Haulers Working in Timberlands Nelson District

<u>Hauler</u>	<u>Type</u>	<u>Tower</u>	<u>H.P.</u>
Washington 127	Highlead	Integral	420
Madill 071	Skyline	Integral	270
Bellis	Skyline	Integral	270
Berger	Highlead	Integral	240
Wilson 2.81	Highlead	Integral	340
Dispatch 1954	Skyline	Wooden	150
		(has been modified to integral)	
Dispatch 1984	Skyline	Wooden	340
Dispatch 1950	Highlead	Wooden	200
Igland (Agr)	Highlead	Lattice	30

Maximum haul distances: Wilson up to 600m  
Rest up to 500m

Productivity range: 120 - 200t/day  
depending on - system  
- average haul distance  
- piece size

Timberlands Nelson's new hauler contractors are purchasing secondhand haulers from around the country. The latest additions have come from Bay of Plenty, Nelson, and Otago. What does influence contractors purchase decisions, is no doubt, the expected short term future of Timberlands, and of course, price.

As far as assisting contractors financially concerning capital investments, we have a very simple philosophy, "pay for it up front if and when you need it".

### FUTURE PLANNING REQUIREMENTS

The areas coming on stream require different planning approaches.

Rai and Hira have very long slopes, up to 1000 metres. The soils are predominantly schists which are stable, therefore allowing mid-slope roads.

Marahau Forest (Motueka) has long spurs, 600 - 800m, with short broken slopes, 100 - 300m, on highly erodable granites. Mid-slope roads are out of the question. Currently we are looking at placing haulers down spurs, and using a two stage system. This should maximise the hauler production due to the relatively short average haul distance, while still achieving deflection sufficient to prevent soil damage.

Haulers needed for the Separation Point granites in Motueka forest need to be in the 300hp range, with a self raising tower, 21 - 24m high, track mounted.

Haulers for Rai need to have high towers, 24 - 27m, 300 - 400hp, with good line speeds, self raising towers, with an ability to use shotgun and scab skyline systems.

Modern haulers (self raising towers, water cooled brakes, etc) can produce 20 - 50% more than old haulers with band brakes and wooden spars. This is due to the faster line speeds, shorter set-

ting up times, and lower non-productive time.

When suitable secondhand haulers are no longer available within New Zealand, then purchase of haulers from overseas may be necessary. It is likely that the industry will look for new or secondhand American or European haulers with plenty of economical life left in them.

Another possibility is the manufacturing of custom designed, New Zealand built haulers like the Bellis or Wilson haulers which were designed for Nelson conditions.

The type of Skyline hauler which is considered most suitable for logging skyline areas in the future, would have the following features:

- 3 - 5 working drums
- 300 - 400 H.P. engine
- Maximum haul of 500m
- Integral tower, 17 - 24m
- Self tightening guys
- Rubber mounted on truck chassis
- Fast line speeds
- Water cooled brakes
- Shotgun, scab, skyline compatible
- Mobile tail hold.

While the "ideal" Highlead hauler would feature:

- 2 working drums
- 300 - 400 H.P. engine
- Maximum haul of 600m
- Telescopic integral tower, 24 - 27m
- Self tightening guys
- Rubber mounted on trailer chassis
- Fast line speeds
- Water cooled brakes
- Able to work shotgun and scab skyline

### THE CHALLENGE(S)

I am now going to sum up, starting from where I came in.

There is a challenge in moving from highlead logging to skyline logging as we move onto more difficult and environmentally sensitive country.

It is not the scale of the change which is challenging, many areas are suited to highlead systems and current logging practices will remain. What is important is that the move to a more complex hauler system raises a set of fundamental challenges that applies to changes needed within the industry as a whole. We have hinted at these in developing a background to hauler logging in Nelson district, we now lay the challenges out as we see them.

. To be cost competitive

New Zealand is realising that it must be competitive in international markets if it is to improve its standard of living. For forestry to be commercially viable and internationally competitive, then it must have competitive logging costs. Logging in difficult country, using more complex skyline systems, is only sustainable if it is cost competitive.

. To capture capital resources

Hauler equipment is capital intensive. There is a challenge in finding logging entrepreneurs with the logging and business skills to be successful. Capital is a tradeable commodity, and logging must compete with other businesses for scarce capital resources. In Nelson we have been encouraged by the willingness of prime contractors to meet this challenge.

. To maximise the utilisation of capital intensive equipment

There is pressure to move to high capital cost hauler

equipment. To be cost competitive with this equipment, it must perform to capacity. Under current logging practices in Nelson, the skid site can be an area of log congestion which limits equipment utilisation. Elimination of this problem requires a review of our whole logging system, from planning through to marketing.

. To improve logging planning on steep erodable country

Within the next 3 years, Nelson will start to move onto the steep highly erodable granites. Logging planning of roads, landings, and settings, will become more critical and skyline systems will become more prevalent.

. To train and improve the skill base in hauler logging

Nelson has a strong, skilled, and stable logging workforce in which training is a high priority. However, not only is the rate of harvesting increasing but the proportion of hauler (and skyline hauling) country is increasing and Nelson must build on its present skill base if it is to take advantage of its position.