

Chapter 11

Planning winch-assist operations



In this chapter you will find out:

- ✓ What makes a good plan.
- ✓ Planning starts well before the felling starts and finishes after the machinery leaves.
- ✓ Your role in the planning process, whether planner, contractor, or operator.

All blocks need careful harvest planning. This chapter goes through how to make a good plan. Planning is much more than just the company paperwork the contractor gets at the start of the job.

Planning should start well before the machines arrive and end after the machines leave. Risk management needs to integrate into all levels of planning.

The steps in good winch-assist planning.



The harvest plan

The planner must understand harvest options and keep up with the rapid evolution of techniques. Planners need to consider all phases from falling, extraction, processing, and loading.

It is essential to understand pre-existing erosion features and erosion prone material (loess, air-fall tephra, unconsolidated marine sand). Plan for re-working ruts so they don't turn into erosion gullies.



Winch-assisted extraction down an ephemeral water way creates a pathway for sediment to reach a stream.

The office or 'paper' plan

The office plan's purpose is the first cut at harvest layout by piecing together information that helps develop the plan. It consists of collecting data that helps understand the block and things that affect layout design like the type of equipment available, extraction method, extraction distances, and the crew's capability. There are six steps to a good office plan.

1. Understand the block

Use data to find out as much information about the block before you visit the field.

- Geology.
- Soil type and soil depth, and strength and susceptibility to rainfall.
- Topography like slope and length, and terrain features like rocky outcrops, incised gullies and benches.
- Ground Roughness.
- Terrain Stability / Classification.
- Aspect.
- Climate and potential timing for operations.
- Infrastructure including old tracks.
- Ground cover and debris.
- Forest resource including stem size, stocking, height.



Old tracks can easily be seen with LiDAR, even with the trees still standing.

2. Know different winch-assist options and methods

There has been a swift expansion to winch-assist since 2010 and the change is still rapidly happening. Planners need to keep up with the changes. Forestry and harvest companies need to lift staff knowledge. Learning opportunities include industry conferences, University of Canterbury harvest courses, and regional wood councils for field days.

3. Understand the crew and their machines

Winch-assist planning isn't generic ground base planning that was typical in the past. Slopes are steep. If known, incorporate information on the crew and the machine types. They are experts in their fields.

- Understand the crew's knowledge, skill and ability and account for it in the plan.
- Use individual contractor's preferences when designing blocks.
- Know the machine capability, and if you don't, learn from operators and contractors.
 - Machine capability on different terrain, soil and slope.
 - How different ground conditions and other factors affect stability and mobility.
 - Machine technical specifications, e.g. manufacturer's rope length, slope limits.
 - Economics vs. safety.
- Don't push or exceed the operator or machine limits. Recognise that some areas are not suitable for mechanical operations. Designate these as 'NO GO' Zones and develop an alternate harvest solution.

4. Identify hazards

Identifying site hazards and understanding the risks is a critical part of your work. Refer to the hazard and risk chapter that identifies winch-assist hazards.

5. Understand laws, regulations and standards

Understanding the legal requirements is critical. Consents and approvals may also be required. Laws and regulations include:

- The Health and Safety at Work Act (2015) and related regulations. They set out health and safety responsibilities and focus on managing work risk. It requires those who create the risk to manage the risk.
- The National Environmental Standards for Plantation Forestry (NES-PF). These forestry specific environmental regulations include harvesting, harvesting tracks and temporary river crossings. Most activities are permitted in low and moderate risk areas without consent if they comply with the permitted activity regulations. Part of that is having an earthworks and harvesting management plan available at the council's request.
- The Heritage New Zealand Pouhere Taonga Act for activities that could disturb or modify archaeological sites. Obtain an authority from Heritage New Zealand if you might damage, modify or destroy an archaeological site.
- The Approved Code of Practice for Safety and Health in Forest Operations (ACOP) provides guidance to undertake any forest activity.

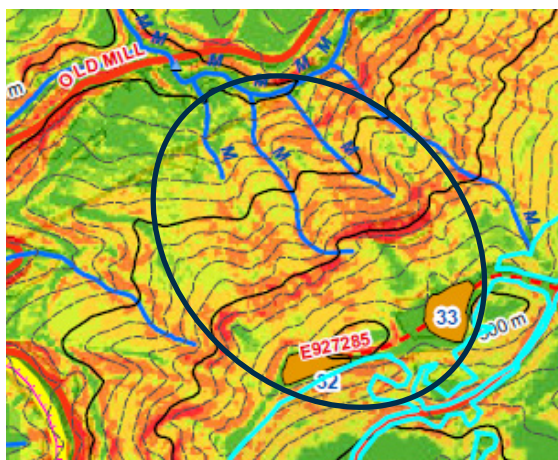
6. Create the office plan

Work with the knowledge gained in the above five steps to develop a plan. This includes draft planning notes and maps. Use for the plan's field verification.

- Locate proposed roads and infrastructure.
- Identify what needs to go uphill rather than downhill, e.g. shovelling more than about a tree length uphill, is very challenging.
- Locate critical anchor and 'corridors'.
- Locate proposed harvesting trails.
- Determine if redirects are needed.
- Identify any possible winch-assist 'no-go' zones.
- Determine if any manual or hand-felling is needed and how this ties in with machine felling.
- Produce maps.
 - Harvest maps.
 - Slope maps useful for operators and preferably electronic. If paper, then at a scale matching the block's base data resolution, e.g. 1:5000 minimum scale, or preferred at 1:2500.
 - LiDAR maps.
 - Aspect maps, especially if this helps determine different soil moisture patterns.
- Identify the initial components of a hazard mgmt plan.



Walk the harvest block to identify hazards.



Use slope maps in conjunction with other mapping tools like LiDAR. The steepest section may limit the setting. For example, is this area a steep soil slope, or is it a rock bluff band?

The field verified plan

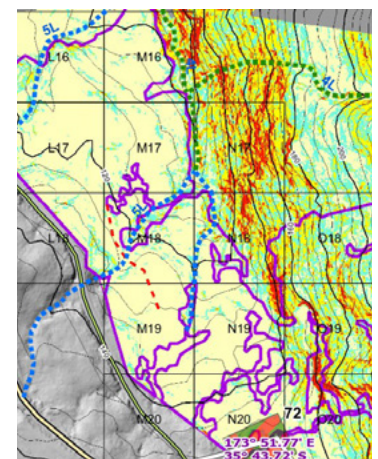
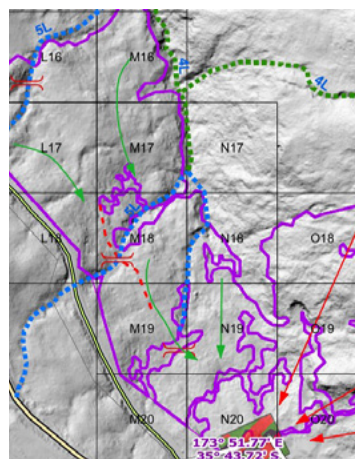
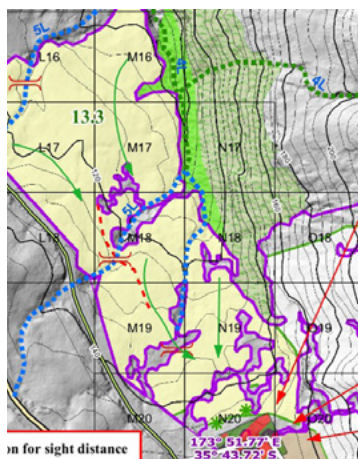
The office or 'paper' planning notes and maps needs field confirmation. The field plan needs to be site specific rather than general. There is no substitute for 'walking the block'.

Field verification should also incorporate ideas and suggestions from the supervisor, contractor and operator. Involving them helps make a better plan. They may not be able to come out with you, so give sufficient time for them to assess the plan and request any changes.

However, this is often not always possible as the layout may be several years before harvest, crew scheduling is not known, contractor equipment changes or the block is tendered.

Field check:

- Confirm if soil, geology, terrain and other site features match the plan's base information.
- Visit proposed landing, road and track locations and confirm these are acceptable.
- Agree that winch-assist is the preferred harvest method, and review the office plan.
- Confirm plan layout, e.g. how to harvest gullies.
- Walk challenging areas, especially those that could impact traction and stability, e.g. poor or wet soils, bluffs or rocky areas.
- Decide on any NO GO zones, and how to manage these.
- Visit and confirm identified hazards along with agreed control measures, e.g. steep faces, rockfall, fences, powerlines, houses, council roads. Additional safety plans may be needed, e.g. Temporary Traffic Control, Electrical Hazard Management Plan.
- Visit key terrain control points, e.g. anchor locations, redirect points.
- View restricted areas and discuss how these are managed, e.g. historic sites, ephemeral or permanent streams.
- Discuss ways to reduce environmental risk, e.g. erodible soils and damage caused by machines on steeper slopes.
- Confirm what maps to supply.



The harvest, hill shade and slope maps, along with the boundary between cable and groundbase provides an operator with valuable information. The maps are also on the operator's cellphone and GPS located.



If the contractor is known, get their advice as they are experts.

Pre-harvest planning

The pre-harvest meeting and sign-off operationalises the plan. The meeting is generally between the forest and the harvesting company.

It typically involves the harvesting manager or supervisor and the contractor. Any changes going forward need to be justified and approved.

Harvest plan meeting and sign-off

The pre-harvest sign-off is a formal agreement around how the block is harvested. It is also a legal requirement under the HSWA section 34 duties to consult, co-operate and coordinate activities. Section 2.4.4 of the ACOP covers the principal's duties on identifying and jointly determining measures to control site specific hazards. The meeting will go through the harvest plan and maps, specific plan requirements, stand information and site hazards. The specifics differ between companies. Both parties must agree on the plan.

Sign-off is simplified if the contractor has been involved in the field verification of the harvest plan. There should already be

an agreement on most aspects of the job. Where they have not been involved in the planning, follow the steps identified in the field verification process above. If necessary, refine the plan.

Give maps to the contractor, foreman and operator that show essential information for their jobs. These should be at the scale they want. Electronic maps are most useful. These incorporate into phones or tablets apps with a GPS location, e.g. Avenza. Make sure operators understand the maps.

Decide or confirm operational aspects like how to open up the block and hazard management. Confirm the machinery and crew skills are suitable for the plan.



Get all the information and maps you need to help make good operational decisions.

Ensure you've been involved in the overall planning.

Contractor felling plan sign-off

The harvest plan shows WHAT needs felling. The felling plan describes HOW it is felled. Best practice is to mark up features of the felling plan on a suitable map, e.g. a slope or contour map at a scale of 1:5,000.

The contractor needs to decide how the block is felled, like anchor locations and main corridors. They need to consider:

- Terrain, e.g. soil, steepness, and gullies.
- Trees, e.g. volume, stocking, piece size, and tree lean.
- Machine or operator capability issues, e.g. under training, give easier areas.
- Felling method. In mixed method felling, the order of hand felling is a key consideration.
- Hazards.
- NO GO zones or protected areas, e.g. waterways, native vegetation, bluffs.
- Block adjacency or neighbour issues, e.g. roads, powerlines, fences.
- Road closure or traffic management requirements.
- 'Wet' and 'dry' weather options.
- Shared boundaries with adjacent harvesting operations.

Planning during operations

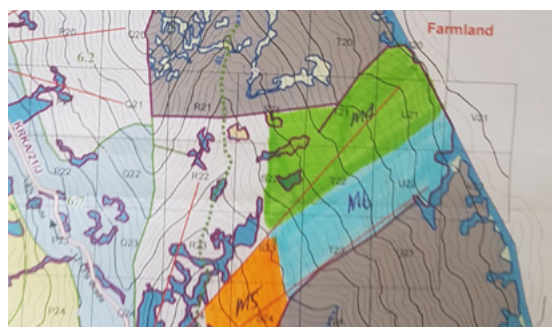
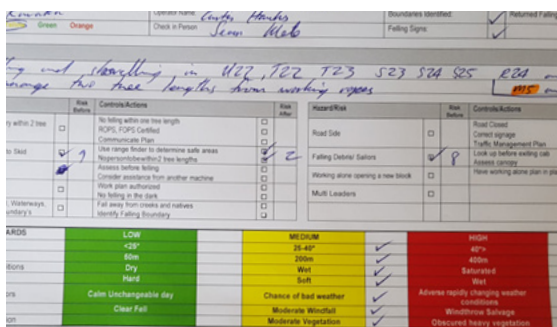
Day-to-day planning during the job is essential. Think ahead.

Plan for the day


- Ensure everyone knows the day-to-day plan. Have tailgate meetings to discuss and agree on the plan. Get everyone to confirm their understanding by signing the meeting record.
- Discuss safety, environment, production and other important information:
 - Harvest changes that could affect machine operations, e.g. anchor shifts, lead angles, or rope redirects.
 - Any situations or challenges that apply to the current day, e.g. traffic management, or interaction between different parts of the operation.
- Hazards and their controls.
- Machine and rigging inspection, maintenance and servicing.
- An alternative plan if conditions change, e.g. rain, or wind.
- Operators understand when to call for assistance and when to suspend work.
- Emergency response procedures.
- Check everyone is fit for work and if there's anything that could affect the job. See the operator and crew chapter.


FISC has detailed information that helps prepare for daily crew meetings.

safetree.nz/resources/tailgate-resources/



Examples of a felling plan map and daily plan

 Stop felling if hazards can't be managed as planned.

 Always have a Plan B in case things don't go according to the plan. Consider alternatives to mech felling on challenging sites including hand felling, delayed felling, pull over with the yarder ropes, or leave standing.

Operational coordination

Clear operational coordination is critical. This could come from the harvesting PCBU, the woodlot manager, or the woodlot owner. They visit the operation to make sure harvesting is according to the plan.

Three additional important tasks are to:

- Ensure production pressure isn't compromising safety and environmental standards.
- Keep current on conditions at the worksite, e.g. machine breakdowns, staff changes, new equipment, and production factors.
- Work with the harvest planner and the contractor to ensure any plan changes are agreed upon and signed off.

Post-harvest review of the planning

Reviewing the job after completion is a great way to incorporate learning into future operations. The planner and contractor should assess the block and

discuss what worked and didn't and how planning and layout can be improved going forward.

Planning responsibilities

Harvest planners must:

1. Plan all blocks and thoroughly field verify.
2. Involve the contractor in the planning process.
3. Understand the crew and machinery capability.
4. Meet and sign-off the plan before work starts.
5. Provide useful planning notes and maps.
6. Learn from each job to improve the plan's quality.

Contractors must:

1. Plan ahead.
2. Every day have a crew pre-start meeting to discuss and agree on the day's plan.
3. Make sure everyone knows their part.

Supervisors must:

1. Make sure the plan is followed.
2. Approve modifying the plan when there are good reasons.
3. Monitor the work.

Operators must:

1. Follow the plan, suggest and get confirmation of plan changes.