



1.1 MECHANICAL LAND PREPARATION (REGULATIONS 72 – 75)

1.1.1 Overview of plantation forestry activity

Mechanical land preparation is a regulated activity under Regulation 5(1)(f) of the NES-PF. The NES-PF ancillary activity regulations (Part 2, subpart 9) and general provisions (Part 2, subpart 10) must be complied with as relevant for *mechanical land preparation*.



*Mechanical land preparation*¹ is defined in the NES-PF as:

- (a) using machinery to prepare land for replanting trees, including root-raking, discing, ripping, roller crushing, clearing slash, and mounding the soil into raised areas; but
- (b) does not include—
- (i) the creation of alternating drains and planting mounds using a V-shaped blade attached to the front of a bulldozer; or
 - (ii) earthworks or forestry quarrying.

Mechanical land preparation comprises a range of operations that are often necessary for the successful establishment or re-establishment of *plantation forests*. *Mechanical land preparation* addresses issues such as poor drainage, the impact of frost, weeds, heavy slash deposits and compacted or dense soil. If the land is not prepared properly, it may limit tree growth or cause crops to die. *Mechanical land preparation* activities include:

- Mechanical cultivation (*ripping* and/or mounding) and spot cultivation to improve the condition of the soil.
- Mechanical raking, mulching, windrowing and *discing* to clear residual slash and create planting sites.
- *Roller crushing* of weeds or woody debris to prepare sites for planting.

1.1.2 Potential adverse environmental effects

Mechanical land preparation can result in the following adverse environmental effects:

- *Sediment* discharge to waterways with associated adverse effects on freshwater quality and aquatic ecosystems.
- Adverse effects on indigenous fauna and flora resulting from ground disturbance.
- Activation of erosion-prone areas.

¹ *Discing, ripping, and roller crushing* are also all defined in the NES-PF: '**discing** means breaking up or tilling the soil surface with a series of large saucer-shaped steel blades joined at the centre of an axle'; '**ripping** means disturbing the subsoil to a depth of 30 to 90 cm with a single-tine or double-tine (or winged) ripper mounted on an agricultural tractor or a bulldozer' and '**roller crushing** means crushing and breaking up vegetation using a large heavy roller released down a slope or towed by a bulldozer or tractor'.



1.1.3 Permitted activity and conditions

Mechanical land preparation is a permitted activity in relation to **territorial authority** functions. *Mechanical land preparation* is a permitted activity in relation to **regional council** functions if Regulation 74 is complied with and it is located in any:

- *Green or yellow zone*;
- *Orange or red zone* where the land slope is less than 25 degrees.
- *Orange or red zone* where the land slope is 25 degrees or more and subsoil is not affected.
- *Orange or red zone* where the land slope is 25 degrees or more, subsoil is affected, but the area covered by the *mechanical land preparation* is 2ha or less in any calendar year.

A summary of the permitted conditions for *mechanical land preparation* is provided in Table 1 below. Sections 1.1.5 to 1.1.8 provide more detailed guidance on these conditions to assist with interpretation and implementation. For the exact wording of the conditions, refer to the NES-PF which can be accessed through the hyperlinks in the table.

Table 1: Permitted activity conditions for mechanical land preparation.

Condition	Regional Council						
Methods (Regulations 74(1)-(5))	<ul style="list-style-type: none"> • <i>Mechanical land preparation</i> must be carried out parallel to the contour of the land, except if <i>roller crushing</i>, downhill <i>ripping</i>, or working in parallel would be unsafe. In these cases, <i>sediment control measures</i> must be used to minimise <i>sediment</i> discharges to water bodies. • Continuous downhill <i>ripping</i> of soil must be less than 50m, and sufficient distance must be maintained between <i>ripping</i> so that entrained water does not reach another <i>ripping</i> furrow. • Downhill <i>ripping</i> is not permitted on land with a gully or tunnel gully erosion risk identified in the ESC as severe or greater. • Exposed areas of soil that may result in <i>sediment</i> entering water must be stabilised as soon as practicable after completion of the activity, and no later than 30 November or 31 May, whichever is sooner. 						
Sediment (Regulations 74(6) and 74(7))	<ul style="list-style-type: none"> • <i>Sediment</i> originating from <i>mechanical land preparation</i> must be managed to ensure that, after reasonable mixing, it does not cause the following effects in receiving waters: <ul style="list-style-type: none"> ○ A conspicuous change in colour or visual clarity; ○ Rendering fresh water unsuitable for consumption by farm animals; ○ Significant adverse effect on aquatic life. • Disturbed soil must be stabilised or contained to minimise the movement of <i>sediment</i> into any <i>water body</i> or coastal water resulting in specified adverse effects. 						
Setbacks (Regulation 74(8))	<p><i>Mechanical land preparation</i> must not occur within the <i>setbacks</i> specified below.</p> <table border="1"> <thead> <tr> <th>5 meters</th> <th>10 meters</th> <th>30 meters</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • <i>Perennial river</i> with a <i>bankfull channel width</i> </td> <td> <ul style="list-style-type: none"> • <i>Perennial river</i> with a <i>bankfull channel width</i> of 3m or more; or • Lake larger than 0.25ha; or • <i>Outstanding freshwater body</i>. </td> <td> <ul style="list-style-type: none"> • Coastal marine area </td> </tr> </tbody> </table>	5 meters	10 meters	30 meters	<ul style="list-style-type: none"> • <i>Perennial river</i> with a <i>bankfull channel width</i> 	<ul style="list-style-type: none"> • <i>Perennial river</i> with a <i>bankfull channel width</i> of 3m or more; or • Lake larger than 0.25ha; or • <i>Outstanding freshwater body</i>. 	<ul style="list-style-type: none"> • Coastal marine area
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	<ul style="list-style-type: none"> of less than 3m; or • <i>Wetland</i> larger than 0.25ha. 	<ul style="list-style-type: none"> • Water body subject to a Water Conservation Order. 	
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1.1.4 Determining whether a resource consent is required

Figure 1 below shows the process to determine whether *mechanical land preparation* needs resource consent and the activity status when consent is required. *Mechanical land preparation* is also required to comply with the ancillary activity regulations (Part 2, subpart 9) and general provisions (Part 2, subpart 10) as relevant to be a permitted activity.

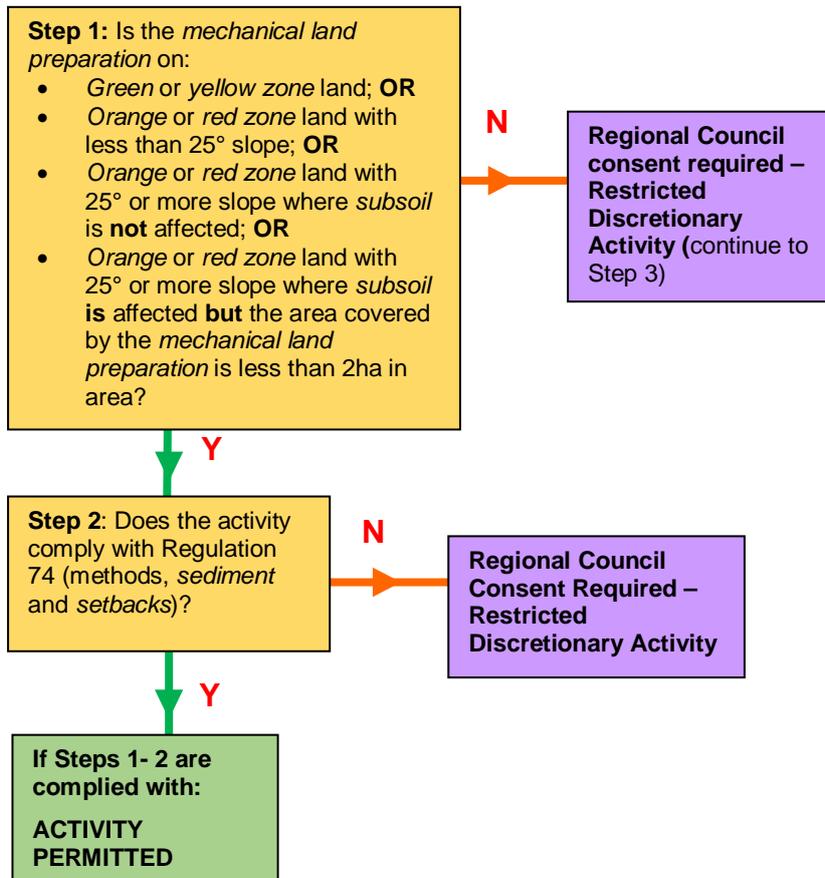


Figure 1: Flow chart to determine whether resource consent is required for mechanical land preparation.

1.1.5 Regulation 73 – Land slope

Regulation 73 requires a resource consent when *mechanical land preparation* is proposed over a certain threshold on steeper land in *orange* and *red* zones and where the *subsoil* is affected. This recognises that, in most cases, the steeper the land, the greater the potential for adverse environmental effects. Section 4.4 of the [NES-PF User Guide](#) provides guidance on how to calculate the slope of land.

Regulation 73 permits *mechanical land preparation* in any *orange* or *red* zone where the land slope is 25 degrees or more where the preparation is undertaken at a depth where the *subsoil* is not affected. *Subsoil* is defined in the NES-PF as 'the layer of soil with low organic content':



- (a) *With colour varying from brown, yellow-brown, red, or olive, or containing speckled colour patterns where poorly drained; and*
- (b) *At depths of 25 cm or more below the surface of the land.'*

Clauses (a) and (b) of this definition are intended to work together – the soil needs to be of the colours or patterns described in (a) and at least of a depth of 25cm. This effectively means that *mechanical land preparation* on steeper sites can only affect *topsoil* material as a permitted activity. *Topsoil* is defined in regulation 55(5) as '*the surface layer of soil, enriched by organic matter and dark brown to black in colour, to a maximum depth of 25cm*'. While this definition only applies to Regulation 55, it helps to clarify the difference between *topsoil* and *subsoil*.

1.1.6 Regulations 74(1)-(5) – Methods

Methods

There are a number of *mechanical land preparation* techniques; all of which aim to provide better site access or a better growing environment for the tree seedlings. For example, frost mounding is a technique to elevate the seedlings slightly above the surrounding ground so they are not exposed to the coldest part of the ground. Root raking and *slash* raking are used to clear woody debris from the previous crop. Some techniques identified and defined in the NES-PF are rarely used but are identified and defined for completeness (e.g. downhill *ripping*).

Stabilisation of exposed soil

Regulation 74(5) states that '*exposed areas of soil that may result in sediment entering water must be stabilised as soon as practicable after the completion of the activity, but no later than 30 November or 31 May, whichever is sooner, after completion of the activity.*'

This requirement is similar to the stabilisation condition for *earthworks* (Regulation 32), except that this regulation refers to specific dates. The intent is the same – to ensure that exposed soil is stabilised no longer than six months after completion of the activity. These deadlines do not override the key requirement of Regulation 74(5), which is that exposed areas of soil which may result in *sediment* entering water '**must be stabilised as soon as practicable**' after the completion of *mechanical land preparation*.

1.1.7 Regulation 74(6) and (7) – Sediment

Regulation 74(6) is consistent with other regulations in the NES-PF relating to the effects of *sediment* in receiving waters. Section 4.9 of the [NES-PF User Guide](#) provides general guidance on the water quality standards in the NES-PF for *sediment* discharges in receiving environments after reasonable mixing.

Regulation 74(7) requires disturbed soil to be stabilised or contained to minimise the movement of *sediment* into *water bodies* or coastal water, resulting in the damming or diversion of any water body, or damage to downstream infrastructure, property or receiving environments. The most appropriate methods to stabilise or contain soil disturbed during *mechanical land preparation* will need to be determined on a case-by-case basis, based on the scale and nature of the disturbance and proximity to water bodies. Section 4.8 of the [NES-PF User Guide](#) provides general guidance on the *sediment control measures*. Foresters may also draw on the Forestry Practice Guides developed by MPI and industry, and existing council and industry guidance on *sediment* control and stabilisation measures to comply with Regulation 74(7).



1.1.8 Regulation 74(8) – *Setbacks*

Regulation 74(8) sets out regional *setbacks* from different types of water bodies and the coastal marine area for *mechanical land preparation*. Section 4.3 of the [NES-PF User Guide](#) provides general guidance on regional *setbacks* in the NES-PF.