Ministry for Primary Industries
Manatū Ahu Matua

NES for Plantation Forestry -

Evaluation of effectiveness of NES on Environmental Outcomes

MPI Technical Paper No: 2017/04

Prepared for Ministry for Primary Industries By Boffa Miskell Limited

ISBN No: 978-1-77665-485-7 (online)
ISSN No: 2253-3923 (online)

June 2016

Disclaimer

While every effort has been made to ensure the information is accurate, the Ministry for Primary Industries does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information. Any view or opinion expressed does not necessarily represent the view of the Ministry for Primary Industries.

Requests for further copies should be directed to:

Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

This publication is also available on the Ministry for Primary Industries website at http://www.mpi.govt.nz/news-and-resources/publications/

NES for Plantation Forestry

Evaluation of effectiveness of NES on Environmental Outcomes
Prepared for Ministry for Primary Industries

14 June 2016

Document Quality Assurance

Bibliographic reference for citation: Boffa Miskell Limited 2016. *NES for Plantation Forestry: Evaluation of effectiveness of NES on Environmental Outcomes*. Report prepared by Boffa Miskell Limited for Ministry for Primary Industries.		
Prepared by:	Sarah Flynn Associate Principal Ecologist Boffa Miskell Limited	
Reviewed by:	Ian Boothroyd Senior Principal Ecologist Boffa Miskell Limited	
Status: FINAL	Revision / version: [1]	Issue date: 14 June 2016

Template revision: 20150331 0000

File ref: A16056

Executive Summary

This report evaluates the effectiveness of the provisions (rules and conditions) of the proposed NES-PF and compares them to existing rules and conditions from a selection of regional and district plans with the purpose of ensuring that any reduction in unwarranted variation does not occur with any significant adverse effects on the environment. The purpose of the evaluation of the NES-PF is to assess the effectiveness of the NES-PF rules, whether the NES-PF permitted activities result in any activities (with associated conditions) that have significant adverse effects on the environment, and to determine the residual risk levels after implementation of these management rules.

The approach was to complete a detailed comparison of forestry-related planning provisions in plans from selected regions throughout the country, including a brief synopsis of the landscape, climate and population characteristics for each district, alongside the NES-PF and forestry ECOP rules and standards. The potential and actual effects of specific forestry activities are briefly summarised before provisions from selected regional and district plans from around the country and the NES-PF and the voluntary code (ECOP) are documented. The efficiency and effectiveness of the regulatory provisions in avoiding, remedying (incl. minimising) or where appropriate mitigating these environmental effects were evaluated. In particular, the environmental effects resulting from the permitted activity rules in the NES-PF were assessed for any significant residual effects.

Nine regions were selected for review: Northland, Bay of Plenty, Gisborne, Hawke's Bay, Greater Wellington, Otago, Canterbury, Tasman and Manawatu-Whanganui. Environmental effects associated with each of eight main activities were identified from reviews of NES-PF and Code of Practice provisions, along with information from the literature review. Rules relevant to each forestry-related activity from each of the plans nominated for review, the NES-PF and ECOP were compiled into a spreadsheet matrix, alongside the list of potential effects for each activity. Plan provisions for each activity were reviewed and scored to gain a measure of the overall likelihood that a given regulatory provision will achieve its aim of avoiding or minimising adverse environmental effects.

The planning analysis identified that most plans address the effects of most activities. Controls on the effects of forestry were found to be at least moderately effective and comprehensive across all of the nine regions assessed. Most planning provisions with respect to forestry-related activities are outcome-focused rather than prescriptive (particularly with respect to regional plans, with few limitations on activities provided specified standards are met. However, standards are often broadly described, without measurable targets or parameters. Most plans at least address the main risk scenarios for most effects, and the majority of plans cover all effects associated with earthworks, harvesting, mechanical land preparation and pruning/ thinning activities comprehensively.

NES-PF provisions are explicitly tailored to forestry-related activities, and hence NES-PF regulatory controls comprise tools and methods to avoid or mitigate anticipated effects (including controlled, restricted discretionary or discretionary status for higher risk activities), rather than identifying thresholds of effect per se. Such tools include the

Erosion Susceptibility Classification and Wilding Spread Risk Calculator which, along with setbacks, essentially require a constraints mapping exercise to be undertaken as part of the afforestation/ harvest planning processes; and the fish spawning indicator, which places constraints on the timing and duration of work.

Various site-specific effects (such as impacts on biodiversity, cultural sites, landscape values, etc.) are effectively addressed in the NES-PF by way of reference to schedules, overlays or other relevant provisions in district and regional plans. The most significant difference in scope between NES-PF and status-quo planning provisions is that effects associated with afforestation and replanting, are directly addressed in the NES-PF, resolving a key area of inconsistency in regional and district plans. In particular, consideration of matters such as the erosion potential of land and risk of wilding pine spread enable future effects of forestry to be anticipated and avoided or more effectively controlled compared to provisions that rely solely on harvest management. A few plans also appear to lack a means of controlling forestry-related quarrying, which is expressly provided for in the NES-PF.

In practice, having a single document that identifies all forestry related activities, potential effects and associated controls also greatly simplifies and clarifies the regulatory process for forestry practitioners, especially for small-scale operators who may lack the expertise required to navigate and interpret regulatory plans.

In conclusion, the permitted activity provisions of the NES-PF require appropriate, best-practice conventional plantation management practices to be applied. The NES-PF allows for additional stringency to be applied where appropriate. This overall approach effectively ensures that the NES-PF limits the requirement for resource consent to the most severe end of the risk threshold and that no significant residual effects arise from activities that are permitted.

CONTENTS

Appendix 2

Results of analysis of Plan rules

1.0 Introduction

1.1 Background

The Government is proposing to introduce a National Environmental Standard (NES) for plantation forestry (NES-PF). Plantation forestry delivers significant economic and social benefits to New Zealand, but must be carried out in a way that avoids, remedies or mitigates adverse environmental effects under the Resource Management Act (1991). Councils currently set objectives and policies, and rules to manage the environmental effects of land use activities such as plantation forestry. These rules are developed through community planning processes and establish the conditions under which activities are either permitted or whether resource consents are required in a region or district. As a result plantation forestry is regulated differently in different regions and districts. As plantation forestry is a long life-cycle activity, conditions placed on forestry activities may change over the life of a forest or as plans change and are amended.

Some variation in regional and district plans across the country is to be expected as environments and community desires for environmental outcomes differ. However, there is also benefit to removing uncertainties for operators within plantation forestry, and to provide some consistency both to the conditions for land use activities and to provide more consistent environmental outcomes. It is desirable therefore to remove as much unwarranted variation[1] in the way forestry activities are controlled.

This report evaluates the effectiveness of the provisions (rules and conditions) of the proposed NES-PF and compares them to existing rules and conditions from a selection of regional and district plans with the purpose of ensuring that any reduction in unwarranted variation does not occur with any significant adverse effects on the environment.

1.2 National Environmental Standards

An National Environmental Standard (NES) is put in place by regulations made under section 43 of the Resource Management Act (RMA) 1991. An NES sets out technical standards, methods, or requirements for activities or outcomes and may specify permitted activities and conditions and when resource consent is required. A characteristic of an NES is that it applies across the whole country but is implemented locally.

An NES sits in a hierarchy of planning and policy tools, including National Policy Statements (NPS) for the management of natural resources in New Zealand. Both NES and NPS are national instrument documents that sit high in the hierarchy of planning and policy tools, and influence lower level planning documents. An NES takes immediate effect and prevails over the affected rules of a plan. A rule in a plan can only prevail

1 For the purposes of this document and the NES-PF, unwarranted variation is defined as a level of variation between plans that is not justified by environmental, economic, social or cultural benefits and imposes an unnecessary cost.

over a national environmental standard if the NES expressly allows a rule to be more stringent than the standard[1]. A rule in a plan cannot be more lenient than a national environmental standard[2]. Councils must amend plans to remove duplication or conflict with an NES.

Section 43A of the RMA requires that an NES must not permit an activity if it has significant adverse effects on the environment. The significance test for effects applies after permitted activity conditions are applied.

1.3 NES-PF

The purpose of the NES-PF is to maintain or improve the environmental outcomes associated with plantation forestry activities while increasing efficiency and certainty associated with those activities nationally. It is anticipated that increased certainty and efficiency will be achieved by setting out consistent rules and establishing when a plantation forestry activity is permitted and when a resource consent is required. The NES-PF joins five other current NES alongside four current NPS.

Important to the NES-PF are three environmental risk assessment tools:

- Erosion Susceptibility Classification (ESC)
- Fish Spawning Indicator
- Wilding Spread Risk Calculator

These tools assist in determining the level of environmental risk, and the consequent response in rules (and conditions). Using these tools, especially the ESC, allows activities to be permitted (with conditions) where risks are low to moderate. Where risks are higher, the activities are more tightly controlled, typically requiring resource consent.

The NES-PF allows for flexibility for council rules to apply either through greater stringency or through leaving activities or effects out of scope. However this division is indicative only and the drafting process will determine the most appropriate mechanism to provide flexibility to councils in regards to each matter.

Matters for which stringency is allowed include where it is necessary for the protection of:

- the coastal environment;
- outstanding natural features and landscapes;
- areas of significant indigenous vegetation and habitats of significant indigenous fauna); and
- where it is necessary to achieve the objectives of the New Zealand Coastal Policy Statement, The National Policy Statement for Freshwater Management, or any other National Policy Statement approved under section 52 of the RMA.

Other activities and effects that could occur during forestry activities but are not covered by the proposed NES-PF rules include (but are not limited to) agrichemical use, burning, gravel extraction from the beds of rivers, milling and other processing of timber and the

[2] http://www.qualityplanning.org.nz/index.php/plan-steps/writing-plans/linkages-between-key-documents-strategies-and-statutory-acknowledgements

use and development of land that has the potential to be affected by containments in soil, and effects on heritage and archaeology and water yield.

Also, vegetation clearance before afforestation is not included as an activity in the NES-PF; it is covered in existing council rules. The NES-PF is only relevant from the planting (afforestation) phase and does not cover the clearance of indigenous vegetation (if any) before afforestation.

2.0 Purpose and scope of report

2.1 Purpose

The purpose of the evaluation of the NES-PF is to assess the effectiveness of the NES-PF rules, whether the NES-PF permitted activities result in any activities (with associated conditions) that have significant adverse effects on the environment, and to determine the residual risk levels after implementation of these management rules.

2.2 Scope

The scope of the evaluation of the NES-PF is as follows:

1. Describe the beneficial and adverse environmental effects of plantation forests in New Zealand, accounting for differences in land type and receiving environment, and including social and cultural values;
2. Describe and broadly rate the risks and adverse environmental effects of plantation forestry activities in New Zealand, accounting for the range in scale and type of forestry operations;
3. Describe the anticipated environmental outcomes achieved by status quo rules and activity status thresholds in avoiding, remedying or mitigating the adverse effects of specified plantation forestry activities, and contrast these with anticipated outcomes achieved by the revised NES-PF regulations.
4. Identify potential additional environmental gains achieved through 'voluntary' industry practices as set out in the current Environmental Code of Practice (ECOP), and clarify the differences between the ECOP, status quo Council regulations, and the NES-PF.
5. Identify whether the NES-PF permits any activities (with associated conditions) that have significant adverse effects on the environment.
6. Identify assumptions and associated uncertainties made in the course of the above evaluations and assess the potential impact on the robustness of conclusions.

2.3 Approach

Our approach is to complete a detailed comparison of forestry-related planning provisions in plans from selected regions throughout the country, including a brief synopsis of the landscape, climate and population characteristics for each district, alongside the NES-PF and forestry ECOP rules and standards. First we draw on the comprehensive existing body of published literature and institutional knowledge around the environmental effects of plantation forestry practices in New Zealand for the purposes of identifying potential effects of specific forestry activities. We then compile planning provisions from selected regional and district plans from around the country and include the NES-PF and the voluntary code (ECOP). We then evaluate the efficiency and effectiveness of the regulatory provisions in avoiding, remedying (incl. minimising) or where appropriate mitigating these environmental effect. In undertaking our evaluation we consider whether the environmental effects resulting from the permitted activity rules in the NES-PF are significant.

2.4 Layout of report

We have laid out our evaluation report in the following sections:

Section 2 lays out the purpose and scope of the report.

Section 3 sets out the forestry activities to be addressed in this report.

Section 4 provides a summary of the environmental effects of forestry in New Zealand.

Section 5 details our approach and method for our evaluation of the NES-PF compared with regional rules and s subset of relevant district plan rules.

Section 6 provides conclusions from the evaluation.

2.5 What this report is not

The scope of this report is quite clear but we note that this report is not:

- A detailed literature review of the effects of plantation forestry on the environment.
- A detailed technical assessment or synthesis of environmental effects arising from forestry activities is beyond the scope of this proposal.
- A detailed critique of regional rules across the country.
- A detailed critique of the provisions of the NES-PF.

3.0 Plantation forestry activities in NZ

Plantation forestry involves a life cycle of some 26-32 years (for *Pinus radiata*) and involves a number of specific activities from raising seedlings to the final harvest and removal from the site. These activities occur through the various stages of the plantation cycle:

- Land preparation phase.
- Planting phase.
- Growth and maintenance phase.
- Harvest and removal phase.
- Replanting phase.

For the purposes of this evaluation the forestry activities provided for in the NES-PF and outlined in Table 1 will be evaluated.

4.0 Environmental Effects of Plantation Forestry in New Zealand

4.1 Introduction

Plantation forestry in New Zealand provides a broad spectrum of economic, social and environmental benefits but the activities associated with the forestry life cycle have to be managed to avoid, minimise or in some cases mitigate for any adverse impacts on the environment. Terrestrial, aquatic (freshwater) and coastal and marine environments are all sensitive to changes that can occur as a result of these forestry activities. This section provides a broad overview of the environmental effects of the activities associated plantation forestry on these environments (terrestrial, aquatic (freshwater) and coastal and marine). The focus is on biological, and bio-physical effects of plantation forestry, as well as effects on ecosystem services.

Table 1: Description of forestry activities.

Activity	Phase	Description#
Mechanical land preparation	Land preparation	Root raking, discing, mounding and spot mounding, contour and downhill ripping and roller crushing (without tracking), and other cultivation of land and associated removal of vegetation. V-blading involving disturbance of subsoil will be considered under earthwork rules. Note: mechanical land preparation is not included in the definition of earthworks.
Afforestation	Planting	The act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.
Earthworks	All	Modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction upgrading and maintenance, landing construction, stream crossing approaches, and cut and fill operation, and damage to vegetation but does not include soil disturbance by machinery passes.
Forestry quarrying	All	The extraction and processing of rock, sand or gravel, within the boundaries of a forestry site, for the formation and maintenance of forest roads and construction of other forest infrastructure including but not limited to landings, river crossing approaches and abutments, and forestry tracks. This includes extraction of alluvial gravels outside of the bed of a river, extraction of minerals from 'borrow pits', and the processing and stockpiling of material at the forest quarry site.
River crossings	All	The construction, installation, placement, use, maintenance and removal of structures that are in, on or over the bed of a river, lake or wetland that provide for vehicles to get over the water body, and associated bed disturbance. Structures include single culverts, battery culverts, drift decks, fords, bridges, and single span bridges.
Pruning and thinning-to-waste	Growth and maintenance	Pruning involves the removal of branches from the lower section of a tree to produce high-quality logs. Thinning involves selective felling of trees within a stand. Thinning-to-waste operations leave the felled trees in situ. .

Harvesting	Harvesting and removal	Harvesting (or logging) involves felling trees, extracting them, processing them into logs and loading the logs onto trucks for delivery to processing plants and export ports. Harvesting includes production thinning.
Replanting	Replanting	Planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.

[#] Descriptions from NES-PF

4.2 Terrestrial environments

Plantation forest have a range of positive and negative effects on terrestrial environments. The act of preparing land for planting and the planting of a production forestry crop on land that is not currently in plantation forest does result in both positive and negative effects on soils, biodiversity, erosion and water yield.

Effects on biodiversity

The value of plantation forestry to conservation and biodiversity has only been recognised in recent years. For many years production forests were at least perceived to be a poor habitat for native species (Norton and Miller 2000), but several studies (e.g., Brockerhoff et al. 2005, MacLeod et al. 2008, Pawson et al. 2010) have highlighted how plantation forests provide habitats for threatened indigenous species and for non-threatened species, as well as benefits to ecosystem services and other functions. Pawson et al (2010) focused on threatened indigenous species and the direct and indirect benefits of plantation forests and concluded that the conservation value of planted forests could be improved.

In a similar vein Ogden et al. (1997) pointed to the richness of native plant species that occur under *Pinus radiata* stands. They found that indigenous plant diversity increased as the stands aged, and that without management the biodiversity becomes a function of mean rotation time. A secondary effect of afforestation is the potential for the spread of weeds and pests in environments, and especially for the spread of wilding pine.

Erosion and sediment generation

Much has been written on sediment generation from forests particularly the accelerated sediment generation from road construction and road failures, mass movement failures have been well documented (Marden et al 2006). Sediment generation from harvesting has received similar attention and the effects of the various phases of forestry management on erosion and sediment generation are now better understood. Sediment generation that reaches streams occurs less from general forestry practices than other landuses, especially pasture use, but increased sediment generated during extreme weather events can reach waterways. The wash of sediments downslope is not a significant contributor to sediment reaching streams.

Marden et al. (2006) found that 88% of soil generated from forest harvesting activities such as soil-scraping, slopewash and landslides remained on-slope in the Whangapoua Forest on the Coromandel Peninsula and that the greatest amount of sediment delivered to streams was a result of a single, storm-related, landsliding event.

In the Pakuratahi forest study in Hawke's Bay, Fahey and Marden (2006) found that coastal Hawke's Bay pasture land use can yield 3 – 4 times more suspended sediment than those catchments in mature plantation forests in the pre-harvesting period. However, they found that during the logging phase of the harvesting period, the situation can be reversed, with the amount of sediment being 2 – 3 times that generated from comparable pasture catchments. The main sources of sediment are from cutbank and sidecast failures, shallow landslides, and channel beds and banks. Slopewash on cutovers is not an important sediment generating process. The data also confirm that, in the absence of a major storm event at or shortly after harvesting, total suspended sediment yields over a full forest rotation in this type of terrain will be substantially less than those from catchments in pasture. Forest roads, with over-steepend cutbacks or loose unstable sidecast are very prone to slope failure, and sediment generation from this source over a short period of time can be many times greater than that expected by one year of average surface runoff (Coker and Fahey 1993).

Conversion of pasture land into pine plantations generally improves stream water quality (see section 4.3) by reducing contaminant inputs such as sediments, nutrients, pathogens and agri-chemicals (Fahey et al. 2004).

Marden (2012) argued that afforestation (cf. reforestation) of unstable and degraded parts of the East Coast region of New Zealand, predominantly with exotic pines, has successfully stabilised existing erosion forms and prevented the initiation of new ones. He showed that sediment generation from earth flows and shallow landslides would be negligible within eight to 10 years of planting. This also means a reduction in risk to infrastructure by sedimentation and flooding. The reduction in sediment generation from hill slopes will, in the longer term, result in bedload aggradation rates in major catchments (Marden 2012). Similarly channel incision will occur and is considered as being beneficial leading to reductions in the cost of bridge replacement and road repairs (Marden 2012).

4.3 Aquatic environments

Effects on aquatic biodiversity

The effects of plantation forestry on aquatic biodiversity are equally as mixed as for terrestrial environments. Several studies have compared the benthic macroinvertebrate and fish faunas of streams of different land use including the effects of production forestry (summarised in Harding et al. 2000 and Fahey et al. 2004). The effects of afforestation of pastureland on aquatic biodiversity can reverse the effects of pasture development, and lead to communities and stream conditions more similar to native forest conditions, generally considered a positive outcome (Quinn et al. 1997). Other effects of afforestation occur through changes in channel morphology and widening and reductions in light regimes through shading (Davies-Colley 1997, Davies-Colley and Quinn 1998, Boothroyd 2004).

In contrast, increased sedimentation in waterways resulting from harvesting practices can lead to detrimental effects on aquatic communities. The effects can vary depending on the retention of a riparian buffer. Quinn et al. (2004), concluded that late-rotation exotic pine plantations can support very similar stream invertebrate communities

to native forests, and highlight the benefit of retaining forested buffers along stream riparian areas to avoid harvesting impacts on stream habitat and invertebrate communities. Similarly Rowe et al. (2002) concluded that riparian strips enhanced the native fish community of streams within logged catchments.

Potential effects of forestry activities may also be influenced by seasonal patterns of biotic behaviour. In particular increased sedimentation occurring during the seasonal migration and spawning cycles of migratory native fish may influence the success of reproduction and recruitment.

Erosion and sediment generation

Erosion and consequent sediment generation into streams is a natural process that usually results from natural (terrestrial) weathering processes, or stream bank erosion as a result of stream fluvial processes. Sediment processes within streams can also result in settlement and resuspension of sediments within the waterway. Sediment particles are transported and deposited in streams and receiving waters, such as lakes, estuaries and coastal bays, as the result of flowing water. Because sediment is naturally transported longitudinally through a river network, its state at any given point will be influenced by climate, geology, topography and current velocity (Clapcott et al. 2011). Compared to pastoral farming, the presence of closed canopy forest significantly reduces the degree of erosion (especially landsliding) during large storm events (Jones 2008).

Human activities can impact on this natural sediment cycle by accelerating the delivery of sediment to streams and increasing the quantity of smaller particle sizes. The effect of excess in-stream sedimentation is recognised as a major impact of changing land use on river health. In particular, sediment alters the physical habitat by clogging interstitial spaces used as refugia by benthic invertebrates and fish, by altering food resources and by removing sites used for egg laying. As such, sediment can affect the diversity and composition of biotic communities. Excess sediment can also affect the aesthetic appeal of rivers and streams for human recreation.

Afforestation is beneficial for reducing sediment generation that reaches streams through:

- Removal of grazing animals.
- Reductions in fertiliser inputs.
- Influence over timing of nutrient losses.
- Reducing waste bacteriological and pathogen inputs.
- Natural regeneration[3] or planting of riparian zones.
- Improvements to stability of river banks.

Stream edges are an area of special concern during planting, and many first rotation stands were planted to the stream edge following land clearance or conversion of land use (Hicks et al 2004). Streamside trees can lean out over the water and be difficult to fall back onto the land, and stream banks are particularly prone to erosion when

[3] It is anticipated that in most cases the riparian setback area will likely be left to naturally regenerate with indigenous species dependent on seed source.

exposed. In a study of a Coromandel forest Boothroyd et al., (2004) found that bank erosion was greater at harvested sites where plantation pines occurred at the stream edge (i.e. within the riparian zone), than other forest and riparian treatments.

Marden et al (2006) concluded that in the Coromandel forest studied, a significant reduction in sediment input to streams would have been achieved by eliminating soil scraping from stream side locations and if haul paths had not crossed streams.

Riparian buffer zones (riparian setbacks)

Several previous studies have shown that riparian buffers control the impacts of logging on stream invertebrate communities (e.g., Castelle et al., 1994; Davies and Nelson, 1994; Jackson et al., 2001; Boothroyd et al. 2004; Quinn et al. 2004). Riparian zones (sometimes referred to as Streamside Management Zones) are areas that encompass the stream margins (banks) and adjacent land area and are distinguished from other land use as they are actively managed for a range of functions and processes unrelated to the land use inland. The protective effects of retaining riparian buffers during all phases of the planation forest cycle have been attributed to:

- Control of riparian and streambank soil disturbance and organic matter input by limiting machinery access to the near stream area;
- Maintaining shade, that reduces temperature increase and changes in primary production and periphyton biomass;
- Maintaining riparian leaf litter input and wood; and
- Riparian litter layers and vegetation reducing sediment and nutrients in runoff from the logged area.

Several studies have shown that the retention of an intact vegetated riparian buffer during harvest operations are effective at maintaining low light regimes (shade), channel bank stability and maintaining biotic communities (Boothroyd et al. 2004; Quinn et al. 2004; Rowe et al. 2002; Thompson et al. 2009). Boothroyd and Langer (1999) provide a review of forest harvesting and riparian management guidelines.

Meleason and Quinn (2004) found that native vegetation riparian buffers of five and 30 m width within plantation forests reduced the median daily maximum air temperatures within the buffer zone by 3.25 and 3.42^{o}C compared with a clearcut area in riparian areas. This indicates that even narrow forested buffers can maintain cool riparian air temperatures that enhance riparian habitat quality for adult insects and other terrestrial organisms.

Stream crossings

Stream crossings are an inevitable consequence of building roads through forests. The key aquatic issue at stream crossings is the maintenance of fish passage, reducing any impediment to flows, and reducing sediment generation. Where culverts are used at stream crossings the key effects are the physical disturbance to the waterway during construction and placing of the culvert in the streambed, and the potential prevention of upstream passage for migratory fish and other aquatic organisms between upstream

and downstream sections of the waterway. Scour and sediment intrusion can occur downstream of the culvert as water velocities increase at the outlet.

Catchment water yield

Several studies have shown that converting pasture or tussock grassland to plantation forestry reduces water yield (i.e., results in less water availability in waterways as water is intercepted or utilised by the trees); and that harvesting increases water yield (Fahey et al. 2004). Estimates of reductions in water yield from conversions to plantation forestry vary. Rowe (2003) found that at the Waiwhiu catchment (806 ha in Northland), after 47% of conversion of the catchment to forest and 23 years of growth, the annual decrease in water yield was 25%. The reduction in water yield was even higher (81%) in small catchments (2.7-3.4 ha) in the Moutere Hills near Nelson when converted to plantation forestry (Duncan 1995). In these and other studies it is notable that it is the 'canopy close' phase of reasonably mature growth of the trees that impacts on water yield.

A positive benefit of the reduction in water yield from afforestation (and replanting) once trees have matured is a reduction in annual peak flows and thus a reduction in the risk of downstream flooding. Duncan (1995) found large differences in flood peaks between pasture and mature pine catchments, with mean annual floods from pine forests some 35% of those from pasture catchments.

There is less information available on the effects of forest stand management on water yield. Thinning can result in increased soil water (Whitehead and Kelliher 1991), but can also result in the growth of a denser understorey (Kelliher et al. 1986).

Water quality

Several studies have largely compared the water quality of broad land use types (i.e., indigenous and plantation forests, pasture, urban etc.), and Baillie and Neary (2015) have recently reviewed water quality in New Zealand's planted forests. They found that afforestation of pasture land significantly improved a wide range of water quality attributes such as stream temperature, nutrient and sediment concentrations and microbial contamination within 4-6 years of planting. In mid-rotation to mature forests, a large proportion of the forestry cycle, water quality was highly variable but characterised by cool water temperatures, and low concentrations of sediment and nutrients. Impacts of harvesting on water quality attributes were greatest when harvesting occurred up to the stream edge. In the Pakuratahi land use study in Hawke's Bay streams, Fahey and Stansfield (2006) found that streams draining pasture and areas in mature forest have similar levels of turbidity, nitrate–N, total phosphorus, and total dissolved phosphorus. In this study, harvesting did not cause any significant increase in the concentrations of any of these parameters. Harvest impacts can be mediated by the retention of intact riparian buffers and to a lesser extent by retention of moderate quantities of logging slash across small stream channels.

Lakes and wetlands

Most of the discussion above has focused on the effects of planation forestry on streams. Lakes, wetlands and other standing bodies of water lack the uni-directional flow of streams, and are inherently more susceptible to the effects of land management activities, and plantation forestry is no exception (Baillie and Neary 2015). The lack of the ability to flush rapidly means that lakes and wetlands are a natural 'sink' for sediment and other contaminants entering the water; and it may take many decades before the

contaminants are flushed out. Although the effects of high producing pasture land on lakes is well known (and generally detrimental), the influence of planted forests is less certain and Verburg et al. (2010) found no significant correlation between the percentage of planted land cover and lake trophic status. Abeil et al. (2011) suggested that the legacy from historical (indigenous) forest clearance and previous land use may be still influencing lake water quality.

4.4 Marine and coastal environments

The effects of forestry activities on the coastal marine environment have been well documented. Morrison et al (2009) argued that In New Zealand, the most important land-based stressor to marine and coastal environments is sedimentation, including both suspended sediment and deposition effects, and associated decreases in water clarity (which may also be driven by nutrient effects). Increases in sedimentation to the coastal zone can produce a wide range of effects, both from deposition of fines on the seafloor, and as suspended sediments in the water column. Morrison et al. (2009) listed impacts from sedimentation as either direct on the species themselves, such as clogging of the gills of filter feeders and decreases in filtering efficiencies with increasing suspended sediment loads (e.g., shellfish)), reductions in settlement success and survival of larval and juvenile phases (e.g., paua, kina), and reductions in the foraging abilities of finfish (e.g., juvenile snapper); or indirect effects such as the modification or loss of important nursery habitats.

The process of sediment movement and deposition in coastal and marine environments varies. Ongoing re-suspension and deposition events (e.g., by storms and fishing gears) may shift sediments between these two states (Morrison et al. 2009). In a case study of the Whangapoua estuary (Coromandel, Waikato), where current land use in the catchment is some 54% exotic forest, mangrove cover has more than doubled, and seagrass cover more than halved, over the last 50 years (Jones 2008). Since 1993 there have been gradual declines in the abundance of invertebrate species known to be sensitive to sedimentation (Jones 2008). A major storm in March 1995 demonstrated the impact that such events can have on seagrass meadows and their associated fauna (Morrisey et al. 1995). Morrisey et al. (1999) went on to conclude that the critical factor appeared to be sediment yield from forested areas (both absolute, and relative to alternative end-uses) in response to such occasional large events, rather than chronic yields in response to small, more frequent storm events. The environmental history of a catchment can contribute greatly to impacts from current land uses (Gregory et al. 2008), for example, where there is a lot of material that is in the stream channel or banks as a result of Kauri logging, gold mining and plantation forestry. This sediment, which is held in the banks, is gradually flushing through the system. Although it may reach an estuary at the time of forest harvesting, the sediment may have originated from several past land uses.

Evidence of the contribution of sediments from forestry harvesting activities was seen in the Mahurangi Harbour (north Auckland), where Gibbs (2004) found that despite occupying only around 8% of the catchment, exotic pine forest soil accounted for a locally high proportion of recently deposited catchment soil in the river delta zone, with 45 to 80% of the soil coming from this source. However the proportional contribution of soil of exotic pine forest origin decreased down. Using modelled data from the same

catchment, exotic pine forest was estimated to contribute about 14% of the sediment load, i.e., on average, exotic pine forest land use contributes almost twice as much soil per unit area of catchment as pasture and native forest land use (Stroud & Cooper 1997, Stroud 2003).

4.5 Ecosystem services

The Millennium Ecosystems Assessment (MEA 2005) described 10 key ecosystems in the world[4]. Of these forest ecosystems provide the highest number of ecosystem services (Yao et al., 2013). Ecosystem services provided by plantation forests include provisioning, regulating, cultural and supporting services (Table 2). The services range from those that have market values and can be reflected in gross domestic product (GDP) (i.e., provisioning services), to less tangible that are not assessed in market transaction (e.g., avoided erosion, recreation).

The supporting services are basically the biological, chemical and physical processes that underlie the provision of the other three groups of services. These services mostly occur over long periods of time and thus disruptions may result in lag times for outcomes to be evident (e.g., damage to soil formation) or may take a long time to repair (water regulation).

4.6 Biotechnology and genetically modified organisms

Improvements in plantation forestry have long been sought through the application of results of research in biotechnology. Biotechnology can be of significant help in meeting the food and resourcing needs of a growing and increasingly urbanized population," FAO 2012). Application of biotechnologies in forests has been seen as a unique opportunity for obtaining new information on the extent, patterns and functioning of tree genetic diversity; and for providing new tree varieties and reproductive materials adapted to changing environmental, social and economic environments (Fenning and Gershenzon 2002).

[4] Cultivated, dryland, forest, urban, inland water, coastal, marine, polar, mountain, and island ecosystems (MEA 2005)

Table 2: Ecosystem services provided by New Zealand's planted forests (adapted from MEA 2005 and Yao et al., 2013).

Ecosystem service	Elements	Attributes
Provisioning	▪ Wood and fibre ▪ Biofuel	*Security* ▪ Personal safety ▪ Employment ▪ Security from disasters *Basic materials* ▪ Timber ▪ Shelter *Health* ▪ Strength ▪ Well being ▪ Access to clean air and water *Social relations* ▪ Social cohesion ▪ Mutual respect
Regulating	▪ Carbon sequestration ▪ Avoiding erosion ▪ Water quality ▪ Flood mitigation ▪ Biodiversity	
Cultural	▪ Recreation ▪ Native species conservation	
Supporting	▪ Nutrient cycling ▪ Soil formation ▪ Primary production	

Biotechnological advances can assist ion improved:

- Tree breeding and selection.
- Micropropogation.
- Hebicide resistance.
- Insect resistance.
- Flowering modification.
- Modification of lignin composition.

The introduction of genetically modified organisms (GMOs) to the New Zealand environment is one of the more controversial components of modern biotechnology tools. Little is known of the effects of GMOs on the environment. In New Zealand the importation, development, testing, and release of genetically modified organisms are strictly regulated. Such activities must be approved by the Environmental Protection Authority (EPA), which is required to take into account various factors related to the potential risks and benefits of the proposal. These include environmental, economic, social, cultural, and public health considerations. Public notification of applications is generally required under the legislation.

5.0 Evaluation of anticipated environmental outcomes from current regulations, voluntary codes and NES-PF

5.1 Introduction

Anticipated environmental outcomes derived from existing regulatory and voluntary mechanisms were assessed in a desktop review of forestry-related planning provisions in a selection of regional and district plans from throughout the country, alongside the NES-PF and forestry ECOP rules and standards.

5.2 Evaluation methodology

5.2.1 Selection of regional and district plans

Selection of regional and district plans for review was made in order to gain a broad representation of the following:

- Geographic spread and cross-section of New Zealand land environments;
- Demographic and socio-economic range;
- Older and more recent plans; and
- Plan type (unitary plan versus regional and district plans).

Nine regions were selected for review, encompassing the following plans:

- **Northland** - Northland Water and Soil Plan Regional Plan and Far North District Plan – Operative.
- **Bay of Plenty** - Regional Water and Land Plan and Rotorua District Council Operative District Plan.
- **Gisborne** - Combined Regional Land and District Plan.
- **Hawke's Bay** - Hawkes Bay Regional Resource Management Plan and Hastings District Plan.
- **Greater Wellington** - Regional Soil Plan, Regional Freshwater Plan and Wairarapa Combined District Plan.
- **Otago** - Otago Regional Water Plan and Queenstown Lakes District Plan.
- **Canterbury** - Canterbury Land and Water Regional Plan and Hurunui District Plan.

- **Manawatu – Whanganui** - Horizons One Plan and Whanganui District Plan.
- **Tasman** - Tasman Resource Management Plan.

5.2.2 Summary of plan provisions

The NES-PF identifies eight forestry-related activities and outlines a suite of effects associated with each. Activities include:

- Afforestation
- Earthworks
- Harvesting
- Mechanical land preparation
- Pruning and thinning-to-waste
- Forestry quarrying
- Replanting
- River crossings

Environmental effects associated with each of the above activities were identified from reviews of NES-PF and Code of Practice provisions, along with information from the literature review (cf. section 4). Effects associated with each of the above activities are summarised in Table 3.

Table 3: Forestry activities and associated environmental effects identified for the purposes of evaluation.

Forestry activity	*Associated environmental effects*
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Increased environmental and property hazard** *e.g., Increased risk of fire, road ice, damage to infrastructure due to root encroachment, limb drop on powerlines, etc.*
	Damage to cultural sites *i.e., as a result of soil disturbance during planting, root encroachment, etc*
	Degradation of significant terrestrial/ wetland biodiversity *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of disturbance during planting, root encroachment, etc.*
	Compromise to future environmental potential *i.e., establishment of forest in unsuitable areas that are likely to have heightened risks during subsequent forestry activities, such as areas of high erosion potential, or catchments of sensitive waterways.*
	Landscape/ amenity effects *e.g., shading of neighbours, modification to outstanding landscapes*
	Wilding pine spread *i.e., due to establishment of plantation forests in habitats vulnerable to invasion*
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction upgrading and maintenance, landing construction, stream crossing approaches, and cut and fill operation, and damage to vegetation but does not include soil disturbance by machinery.*	**Sediment discharge to waterways** *i.e., due to inadequately controlled runoff, leading to increased turbidity, smothering of riverbeds and accumulation of sediment in downstream receiving environments (e.g., wetlands, estuaries and lakes), and potential discharge of soil borne contaminants into waterway. Primarily of concern due to impacts on aquatic ecosystems.*
	Erosion or damage to soil structure *i.e., due to compaction, loss of A horizon; leading to reduced fertility and diminished productive potential.*
	Damage to cultural sites *i.e., as a result of burial, excavation or other soil movement.*

	Degradation of significant terrestrial/ wetland biodiversity *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of excavation, burial or other soil movement.*

HARVESTING *Harvesting (or logging) involves felling trees, extracting them, processing them into logs and loading the logs onto trucks for delivery to processing plants and export ports. Harvesting includes production thinning.*	**Damage to cultural sites** *i.e., as a result of treefalls, soil disturbance, tree extraction, etc.*
	Degradation of significant terrestrial/ wetland biodiversity *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of treefalls, tree extraction, etc.*
	Erosion or damage to soil structure *i.e., due to compaction, loss of A horizon; leading to reduced fertility and diminished productive potential.*
	Sediment discharge to waterways *i.e., due to inadequately controlled runoff, leading to increased turbidity, smothering of riverbeds and accumulation of sediment in downstream receiving environments (e.g., wetlands, estuaries and lakes), and potential discharge of soil borne contaminants into waterway. Primarily of concern due to impacts on aquatic ecosystems.*
	Deposition of woody debris into waterways *i.e., resulting in smothering or Increased BOD demand due to decomposition of large volumes of biological matter; damming of the watercourse; or physical damage to instream habitat due to fall of debris, or subsequent extraction of timber or slash from the watercourse.*

MECHANICAL *LAND* **PREPARATION** *Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and*	**Erosion, soil loss or damage to soil structure** *i.e., due to compaction, loss of A horizon; leading to reduced fertility and diminished productive potential.*
	Damage to cultural sites *i.e., as a result of soil disturbance, compaction, burial, excavation or other soil movement.*

associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the earthworks rules.	**Degradation of significant terrestrial/ wetland biodiversity** *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of soil compaction, excavation, burial, etc.; or due to disturbance by machinery, removal of woody debris, etc.*
	Sediment discharge to waterways *i.e., due to inadequately controlled runoff, leading to increased turbidity, smothering of riverbeds and accumulation of sediment in downstream receiving environments (e.g., wetlands, estuaries and lakes), and potential discharge of soil borne contaminants into waterway. Primarily of concern due to impacts on aquatic ecosystems.*

PRUNING AND THINING TO WASTE *Pruning involves the removal of branches from the lower section of a tree to produce high-quality logs. Thinning involves selective felling of trees within a stand. Thinning-to-waste operations leave the felled trees in situ.*	**Deposition of woody debris into waterways** *i.e., resulting in smothering or Increased BOD demand due to decomposition of large volumes of biological matter; damming of the watercourse; or physical damage to instream habitat due to fall of debris, or subsequent extraction of timber or slash from the watercourse.*

FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads and construction of other forest infrastructure including but not limited to landings, river crossing approaches and abutments, forestry tracks. This includes extraction of alluvial gravels outside of the bed of a river, extraction of minerals from 'borrow pits', and the processing and stockpiling of material at the forest quarry site. These controls address noise, dust and vehicle issues associated with quarrying. Earthworks and mechanical land preparation do*	**Sediment discharge to waterways** *i.e., due to inadequately controlled runoff, leading to increased turbidity, smothering of riverbeds and accumulation of sediment in downstream receiving environments (e.g., wetlands, estuaries and lakes), and potential discharge of soil borne contaminants into waterway. Primarily of concern due to impacts on aquatic ecosystems.*
	Erosion or damage to soil structure *i.e., due to compaction, loss of A horizon; leading to reduced fertility and diminished productive potential.*
	Damage to cultural sites *i.e., as a result of soil disturbance, compaction, burial, excavation or other soil movement.*
	Degradation of significant biodiversity *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of soil compaction, excavation, burial, etc.; or due to disturbance by machinery, removal of woody debris, etc.*

not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to specific controls.	
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.*	**Increased environmental and property hazard** *e.g., Increased risk of fire, road ice, damage to infrastructure due to root encroachment, limb drop on powerlines, etc.*
	Damage to cultural sites *i.e., as a result of soil disturbance during planting, root encroachment, etc*
	Degradation of significant terrestrial/ wetland biodiversity *i.e., damage to wetlands, riparian vegetation, significant forest remnants or other significant ecological features surrounded by or immediately adjacent to plantation forest as a result of disturbance during planting, root encroachment, etc.*
	Compromise to future environmental potential *i.e., establishment of forest in unsuitable areas that are likely to have heightened risks during subsequent forestry activities, such as areas of high erosion potential, or catchments of sensitive waterways.*
	Wilding pine spread *i.e., due to establishment of plantation forests in habitats vulnerable to invasion*
RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river,* *lake or wetland that provide for vehicles to get over the water body, and associated bed disturbance.*	**Sedimentation of the water column and bed of the river** *i.e., due to mobilisation of sediment from riverbed or banks during installation or use of river crossing, leading to increased turbidity, smothering of riverbeds and accumulation of sediment in downstream receiving environments.*
	Disruption of fish passage *i.e., due to poor design or installation of culverts or other instream structures.*
	Damage to the river bed and downstream infrastructure *i.e., disturbance during works or use, increased erosion or scour due to altered flow path.*
	Impediment to water flows

	i.e., damming or flow restriction due to inadequate design parameters for culverts, bridge spans, etc.
	Loss of instream habitat (fords) and spawning habitat *i.e., loss or degradation of instream or spawning habitat due to installation of structures.*

5.2.3 Evaluation criteria and scoring system

Rules relevant to each forestry-related activity from each of the plans nominated for review, the NES-PF and ECOP were compiled into a spreadsheet matrix, alongside the list of potential effects for each activity.

Plan provisions for each activity were reviewed and scored to gain a measure of the overall likelihood that a given regulatory provision will achieve its aim of avoiding or minimising adverse environmental effects. The attributes and the scoring scale is provided in Table 4.

5.2.4 Assumptions and uncertainties

In preparing this evaluation of the NES-PF against provisions of regional and district plans we have made the following assumptions:

- Our evaluation of anticipated environmental outcomes achieved by status quo planning rules, ECOP guidelines and NES provisions considers the anticipated effect of each forestry-related activity (i.e., afforestation, harvesting, river crossings etc.) relative to the status-quo in the context of the existing environment.

- We have assessed the performance of regulatory provisions that rely on tools and mechanisms (e.g., zoning based on erosion susceptibility, the Wilding Spread Risk Calculator) on the basis that these tools and mechanisms achieve their intended purpose, i.e., we have not evaluated the performance of the mechanisms themselves.

- We have assessed the performance of regulatory controls on permitted activities with the assumption that forestry operators adhere to these controls, and that Councils assess compliance of forestry operators against these controls.

- We have assumed that the standards specified are achievable; for example permitted activity standards for harvesting require that "*all disturbed soil is stabilised or contained so as to prevent movement of sediment into any water body or coastal water that would result in effects including sedimentation of the bed of any surface water body, or significant adverse effects on aquatic habitat*".

- The focus of evaluation is on the rules in regional and district plans, and no consideration of objectives, policies, other methods and technical publications has been undertaken. Similarly no evaluation of any Council or underlying technical publications has been made.

- We have assumed that where the NES-PF allows flexibility for plan rules to apply, through stringency or effects or matters left out of scope, that councils have (or will

develop as required), plan rules that are effective and achieve the purpose of the RMA.

- The report does not attempt to assess the appropriateness of the rules, which vary significantly around the country. Each council is tasked to manage different types of environments and land use pressures within their region, independent of other councils. As a result, rules vary significantly between and within councils.

- The evaluation has been carried out on current operational versions of regional and district plans. Plans in review have not been considered in this report.

- The regional planning documents for the 16 councils are all large, complex documents, with many overlays, cross references and exceptions. All efforts have been undertaken to ensure accuracy and completeness of regulatory results. Where possible results have been compared against the 2007 study titled 'Review of Regional Plan Rules on Land Disturbance Activities' and confirmed (verbally) with the relevant councils.

- For some of the forestry activities, particularly harvesting, greatest impacts can occur during extreme storm events coinciding with the activity. For the purposes of our assessment we have assessed the potential for the proposed rules (as best practice) to avoid, remedy or mitigate the consequences of activities in or post-storm events, as well as during typical climatic conditions. We have not attempted to define a typical storm event; rather we have understood the effects of storms from the scientific literature and have used that as a basis for our evaluation.

- Unless specified otherwise, our evaluation has assessed the NES-PF against Council plans based on primary (as opposed to secondary effects) of plantation forestry activities. Primary effects are the direct effects of the respective activity, whilst secondary effects are the indirect effects that are a consequence of the initial direct effect.

5.3 Outcomes of Evaluation

5.3.1 Introduction

A matrix of all the results of the evaluation is provided in Appendix 1. By way of a graphical summary, the outcomes of the evaluation (scoring) are shown in Table 5.

Table 4: Criteria and scoring matrix for evaluating provisions within regional and district plan, ECOP and NES-PF.

Score / Risk criteria	Green	Orange	Yellow	Red
Transparency	Provisions explicitly address activity and associated risks; unambiguous and straightforward - high certainty that effects will be appropriately identified and addressed	Provision encompasses effect but does not explicitly define or specify it	Ambiguity as to whether provision has scope to include activity or address effects through controls	No provisions to address the effects
Effectiveness	Provisions work well to minimise effects	Provisions manage effects to a 'tolerance threshold'	Provisions do not substantively address effects	
Adaptability	Provisions allow for site-specific 'tailoring' of management, and advances in best practice	Provisions allow flexibility within set parameters	Rigid and prescriptive	
Specificity	Clearly defined, auditable thresholds and limits	Thresholds and limits specific but difficult to measure or objectively assess	No specific thresholds or limits	
Comprehensiveness	Provision captures and addresses all risk scenarios	Provision captures and addresses main risk scenarios	Provision addresses limited risk scenarios	

Table 5: Summary of evaluation of NES-PF, ECOP and selected Council plans

Activity	Effect	Hawkes Bay					Northland					Gisborne					Wellington					BOP					Canterbury					Horizons					Otago					Tasman					NES - PF					ECOP				
		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness
AFFORESTATION	Increased environmental and property hazard																																																							
	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
	Compromise to future environmental potential																																																							
	Landscape/ amenity effects																																																							
	Wilding pine spread																																																							
EARTHWORKS	Sediment discharge to waterways																																																							
	Erosion, soil loss or damage to soil structure																																																							
	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
HARVESTING	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
	Erosion or damage to soil structure																																																							
	Sediment discharge to waterways																																																							
	Deposition of woody debris into waterways																																																							
MECHANICAL LAND PREPARATION	Erosion or damage to soil structure																																																							
	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
	Discharge of sediment and contaminants into waterways																																																							
PRUNING AND THINNING TO WASTE	Deposition of woody debris into waterways																																																							
FORESTRY QUARRYING	Sediment discharge to waterways																																																							
	Erosion, soil loss or damage to soil structure																																																							
	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
REPLANTING	Increased environmental and property hazard																																																							
	Damage to cultural sites																																																							
	Degradation of significant terrestrial/ wetland biodiversity																																																							
	Compromise to future environmental potential																																																							
	Wilding pine spread																																																							
RIVER CROSSINGS	Sedimentation of the water column and bed of the river																																																							
	Disruption of fish passage																																																							
	Damage to the river bed and downstream infrastructure																																																							
	Impediment to water flows																																																							
	Loss of instream habitat (fords) and spawning habitat																																																							

5.3.2 Regional and District Plans

General overview of plan provisions

The planning analysis summary table (Table 5) identifies that most plans address the effects of most activities. Controls on the effects of forestry were found to be at least moderately effective and comprehensive across all of the nine regions assessed.

Scoring of plans against attribute criteria was based on an assessment of the combined rules from all relevant plans reviewed. In some cases a single unitary plan covered all provisions, but identifying relevant planning regulations with respect to forestry required the review of two or three plans throughout most regions. While second generation plans (e.g., Environment Bay of Plenty, Horizons) have sought to address forestry activities under a single set of rules, all regions also contain relevant "general" rules which manage multiple effects on particular values (for example, landscape), as do district plans (for example, with respect to amenity and biodiversity values). General rules are frequently extensive and complex, with combinations of zones, overlays and mapped features, and rules that vary by zone or overlay. Hence, attribute scores are a broad indication of whether a particular effect has been identified and addressed anywhere in the assemblage of rules, and whether key provisions identified are more or less versatile or comprehensive, and therefore likely to deliver anticipated environmental outcomes. A more detailed analysis of the performance of each set of plan provisions is beyond the scope of this assessment.

Interaction between plans within a region

Forestry is a permitted activity across all of the regions assessed in this study, with regulation by way of various combinations of controls (e.g., setbacks of a specified distance from wetlands and riparian margins), conditions and thresholds (e.g., restrictions on earthworks or harvesting over a specified extent, slope or erosion hazard zone), and measurable standards (e.g., any conspicuous change in colour or visual clarity of water).

The level of duplication or overlap between regional and district plan provisions within a given region with respect to forestry is variable. For example, Hawkes Bay Regional Resource Management Plan provides sediment discharge standards for earthworks and vegetation disturbance, and specifies that erosion-prone land must be revegetated or appropriately retained, while Hastings District Plan prescribes limits to the extent of earthworks and specifies a maximum slope that can be worked under Permitted Activity provisions.

By way of comparison, the Canterbury Land and Water Regional Plan includes discharge standards, setbacks, controls to limit erosion risk, and thresholds on the extent and timing of earthworks, while Hurunui District plan also provides setbacks and limits to the extent and location of earthworks, both of which differ from that specified in regional plan provisions.

Variation in provisions between district councils within a region was not comprehensively assessed in this study, though incidental comparisons of earthworks provisions in Whakatane and Rotorua district plans identified different constraints on the extent of earthworks to be undertaken as a permitted activity.

Analysis of attribute scores

Earthworks and river crossings are the activities most comprehensively addressed in plan provisions and also in the ECOP. Provisions controlling the generation, discharge and effects of sediments entering waterways occur in most plans. The effects of river crossings are also well regulated overall, particularly fish migration and spawning and impediments to flows.

Harvesting is generally well-regulated, though some plans do this through broad provisions that encompass both earthworks and vegetation clearance.

Mechanical land preparation is almost always addressed under general earthworks provisions, while pruning and thinning falls within harvesting/ vegetation clearance provisions in most plans. None of the regional plans specifically address forestry quarrying, but earthworks provisions in most plans capture the effects of quarrying for forestry purposes.

Some activities (most notably afforestation and replanting) have no controls for some effects in some regions.

A limitation of controlling activities associated with forestry under generic rules for earthworks and vegetation clearance rules is that this creates the potential for uncertainty or confusion on the part of practitioners as to whether forestry-related activities are regulated, or require resource consent. This is especially the case where plans identify "forestry" as a specific activity with permitted status.

All plans scored highly for transparency against most effects, indicating that where an effect is recognised in a plan, provisions to control that effect are reasonably explicit in identifying relevant activities.

A few plans specify total avoidance of effects, or require management to a standard that effects are minimal in their extent, duration and severity, and effects related to water quality and aquatic environments tend to be more stringently controlled. However, most plans control effects to within a specified tolerance threshold, i.e., they allow for some level of residual effect deemed to be acceptable. Detailed consideration of the efficacy or appropriateness of these thresholds is beyond the scope of this analysis, though it was noted that the stringency of provisions did vary substantively between plans.

Most planning provisions with respect to forestry-related activities are outcome-focused rather than prescriptive (particularly with respect to regional plans, with few limitations on activities provided specified standards are met. However, standards are often broadly described, without measurable targets or parameters. Most plans at least address the main risk scenarios for most effects, and the majority of plans cover all effects associated with earthworks, harvesting, mechanical land preparation and pruning/ thinning activities comprehensively.

Rationale for variations between plans

A key objective of the NES-PF is to remove unwarranted variation between councils' planning controls for plantation forestry. Comparative analysis of district and regional plans across the nine study regions identified warranted variation between plans where region- and district- specific provisions related to specific features and characteristics

such as landscape values, biodiversity, heritage and land use capability (Table 6). Councils usually address these matters by using a constraints mapping approach to identify specific zones, features and overlays.

Variations between plans with respect to the choice of specific setback distances, slope thresholds for earthworks, and the use of output standards (such as a visual clarity or deposited sediment limit) to control effects associated with forestry activities are relatively trivial, and appear arbitrary (i.e., they do not vary in relation to any site- specific environmental sensitivities). To illustrate this point, Table 6 provides examples of permitted activity threshold provisions across a range of plans. These types of variation are therefore assessed as unwarranted and, in general, the standards are similar throughout plans.

Specific comments

Water quality

Water quality improvements are provided for under the NPS-Freshwater Management. As the government has an agenda for water reform, the NES-PF includes a number of provisions that address water quality including controls on sediment discharge. It also allows councils to have more stringent rules, when these rules are required to give effect to an NPS under the RMA, including the National Policy Statement on Freshwater Management and the New Zealand Coastal Policy Statement. Thus we do not consider that the NES-PF will result in any significant adverse effects on water quality that are not covered by provisions in the NES or by Council plans.

Biodiversity

Although provisions are included in the NES-PF, we recognised some difficulties in addressing matters of biodiversity effects, largely through their spread throughout the NES-PF. Effects on biodiversity are covered through a range of provisions or conditions including generic conditions (e.g., nesting times and fish spawning), or by allowing greater stringency (e.g., SNAs). Thus, after taking into account these provisions and conditions, and the allowance for stringency, we do not consider that the NES-PF will result in any significant adverse effects on biodiversity.

Genetically modified organisms

The importation, development, field testing, and release of "new organisms," including genetically modified organisms (GMOs), are regulated by the Hazardous Substances and New Organisms Act 1996 (HSNO Act) as administered by the Environmental Protection Authority.

To avoid duplication, the proposed NES-PF includes a provision permitting afforestation using genetically modified tree stock where it has been assessed and approved by the Environmental Protection Authority under the Hazardous Substances and New Organisms Act 1996. The NES-PF is clear in stating that the EPA is best placed to evaluate the risks of genetically modified organisms and that approval and conditions imposed under the EPA regime will be sufficient to ensure any risks associated with the deployment of the tree stock are managed and no significant environmental adverse effects will occur.

Table 6: Permitted activity threshold provisions for nine regional councils of New Zealand.

Region	Riparian Setbacks	Earthworks slope constraint threshold	Permitted discharge standard	Extent of Earthworks permitted	Cut face height
Hawkes Bay *Hastings D.C.	5 m	45 degrees	No significant change in colour/ clarity of adjacent water body after reasonable mixing	*2,000m^3 per annum*	Nil
Northland **Far North D.C.*	5 m	Nil	50g/m^3 suspended solids in **receiving water** at or up to 20 m below discharge point	Nil *5,000m^3 per **site** per annum*	Nil *1.5 m*
Bay of Plenty **Rotorua District Plan*	5 – 40 m *25 m*	35 degrees	No conspicuous change in colour/clarity of any **off-site** receiving water	Nil *500m^{3}per **'activity'***	*2.5 m*
Gisborne	Nil	Nil	No conspicuous change in colour/clarity of surface water	50 m^3 in any 3 month period	05m
Horizons	5 – 10 m	Nil	Specific visual standards for nominated receiving waterbodies	100m^2 per property per annum	
Wellington	Nil	Nil	No discharge to any waterbody being managed in its natural state	1,000m^3 per ha on erosion-prone land	1.5 m / 200m per annum
Canterbury	5-10 m	Nil	50g/m^3 in **discharge** (unless already elevated in receiving environment, in which case use visual clarity standard)	500m^2 or 10% of **area** per annum	0.5 m

Otago **Queenstown Lakes DP -*	Nil *7 m (restricted earthworks)*	Nil	No conspicuous change in colour/clarity of receiving water, or noticeable local sedimentation *<u>Avoid</u> sediment entering water body*	Nil *2500 m^2/1000m^3 per annum per **site***	Nil *1 m*
Tasman	10 – 20 m	35 degrees	Threshold for visual clarity in receiving water at set distance below discharge	100- 300 linear metres per annum	Nil

5.3.3 ECOP

With the exception of forestry-related quarrying, ECOP provisions offer detailed guidance to industry practitioners on identifying and controlling potential adverse effects. ECOP provisions deal with most effects that regional and district plans inconsistently identify or regulate, hence the ECOP will achieve improved effectiveness and comprehensiveness of effects management when it is implemented in conjunction with status-quo planning provisions.

A key difference with planning or NES-PF provisions is that, because the ECOP is essentially a guidance document, it generally lacks measurable targets and thresholds, hence scores for specificity are low. Furthermore, ECOP provisions are voluntary, and hence are less likely to be fully applied by small-scale practitioners not affiliated to larger industry operators.

5.3.4 NES-PF

NES-PF provisions are explicitly tailored to forestry-related activities, and hence consistently score highly for effectiveness and comprehensiveness. These attribute scores are achieved because NES-PF regulatory controls comprise tools and methods to avoid or mitigate anticipated effects (including Restricted Discretionary status for higher risk activities), rather than identifying thresholds of effect per se. Such tools include the Erosion Susceptibility Classification and Wilding Spread Risk Calculator which, along with setbacks, essentially require a constraints mapping exercise to be undertaken as part of the afforestation/ harvest planning processes; and the fish spawning indicator, which places constraints on the timing and duration of work.

Various site-specific effects (such as impacts on biodiversity, cultural sites, landscape values, etc.) are effectively addressed in the NES-PF by way of reference to schedules, overlays or other relevant provisions in district and regional plans. The NES-PF may receive higher attribute scores than plans because it highlights the need to factor these further constraints into planning for forestry-related activities.

The most significant difference in scope between NES-PF and status-quo planning provisions is that effects associated with afforestation and replanting, are directly addressed in the NES-PF, resolving a key area of inconsistency in regional and district plans. In particular, consideration of matters such as the erosion potential of land and risk of wilding pine spread enable future effects of forestry to be anticipated and avoided or more effectively controlled compared to provisions that rely solely on harvest management. A few plans also appear to lack a means of controlling forestry-related quarrying, which is expressly provided for in the NES-PF.

In practice, having a single document that identifies all forestry related activities, potential effects and associated controls also greatly simplifies and clarifies the regulatory process for forestry practitioners, especially for small-scale operators who may lack the expertise required to navigate and interpret regulatory plans.

High attribute scores for adaptability highlight the emphasis NES-PF provisions place on allowing discretion and flexibility to implement best practice in forestry operations in order to limit effects.

In comparison, NES-PF has a similar score for specificity to other plans as a revised sediment discharge rule has been inserted into the NES-PF but it still lacks the targets and thresholds (particularly with respect to sediment discharges and earthwork volumes) that most councils employ to assess compliance.

5.3.5 Permitted activities

The NES-PF focus on permitted activity conditions aimed to ensure that sufficient controls are in place to prevent any significant adverse environmental effects. We evaluated whether the permitted activity conditions provide sufficient controls over forestry activities to ensure any effects are not significant. We examined the permitted rules within the NES-PF and evaluated them against the relevant effects of forestry activities identified above (and within scope of the NES-PF).

5.3.6 Significance of residual effects

Erosion Susceptibility Classification

Erosion and sediment generation induced by forest clearance, and to a lesser extent earthworks and land preparation, is the main source of adverse effects arising from forestry activities, hence the erosion susceptibility classification is key to the effectiveness of the NES-PF in avoiding significant adverse effects. The ESC provides erosion risks specifically for plantation forests on the basis of erosion susceptibility, plantation forest operations and estimation of the frequency of intense, triggering rainfall events within New Zealand.

The ESC differentiates land units that are difficult to afforest without very severe adverse erosion effects (red zone) from areas which may have severe erosion limitations but are suited to conventional plantation management (orange zone), and areas which have moderate or low erosion limitations (yellow and green zones). i.e., the ESC provides a means of identifying where adverse effects may arise in spite of best practice forestry methods being implemented.

Permitted activities

Permitted Activity status is generally given to activities involving soil disturbance on land with low, moderate and high erosion susceptibility. In limited instances the same status is given to localised activities (such as forest quarrying) where land with severe erosion susceptibility occurs. Harvest plans and ESC plans which include clear standards for design and execution of forest operations which have the potential to increase erosion susceptibility are also required, and permitted activity conditions specify a number of practices and methods to be implemented (setbacks, etc.) or avoided.

Wilding pine spread is a key potential adverse effect of afforestation and afforestation is permitted in all except red-zoned land. As with the ESC, the Wilding Spread Risk Calculator provides a tool to identify areas where containment or control of wilding pines

as a result of the plantation would require a substantive commitment to proactive management. Afforestation of these areas is a controlled activity which requires mitigation action to restrict wilding tree spread as a condition of consent.

The set of general conditions for all activities provide a detailed set of overarching controls to specifically minimise effects on biodiversity (fish and wildlife in particular), and amenity.

In summary, the NES-PF application of permitted activity status is not conservative, in that it limits the requirement for resource consent to the most severe end of the risk threshold. Nevertheless, the rationale for this threshold is effects-based, in that consent is required where the effects of an activity cannot necessarily be avoided or mitigated using conventional plantation management practices. In all other circumstances, permitted activity provisions require appropriate, best-practice conventional plantation management practices to be applied. Furthermore additional stringency can be applied where appropriate. This overall approach effectively ensures that no significant residual effects arise from activities that are permitted.

6.0 Further comment

6.1 Monitoring

The need to monitor and audit the effectiveness of the NES-PF is raised at several places in the NES-PF, but the NES-PF is silent on the requirement for monitoring as a provision for compliance of the management of the activities within the standards. The absence of comment on compliance monitoring provisions may stem from the absence of thresholds within the provisions of the NES-PF, and thus the inability to be certain of whether provisions have been met or breached. Councils would be expected to undertake compliance monitoring and enforce the provisions of the NES-PF and it would be helpful for mechanisms to exist so that the results of compliance monitoring can be fed back into evaluations of the effectiveness of the NES-PF. It is our understanding that future programming for the NES-PF will include monitoring to evaluate the effectiveness of the NES-PF. It is through this programme that compliance monitoring can be addressed.

6.2 Site-specific vs non-point effects

Site-specific or site-bound effects (e.g., loss of indigenous vegetation, archaeology) are generally dealt with effectively by district and regional plans. For the most part this is through identifying specific locations and mapping them and presenting them as overlays to the rules. The NES-PF on the other hand, generally deals with non-site-specific effects, most notably erosion and sediment generation induced by forest clearance, and consequently does not include any overlays. Thus as the NES leaves site-specific matters to be addressed by plan rules and those plan rules deal with these effects well, along with the allowance for stringency, means that there are no significant adverse effects from NES-PF permitted activities.

7.0 Main Findings and conclusions

The permitted activity provisions of the NES-PF require appropriate, best-practice conventional plantation management practices to be applied and allows for additional stringency to be applied where appropriate. This overall approach effectively ensures that no significant residual effects arise from activities that are permitted. The NES-PF limits the requirement for resource consent to the most severe end of the risk (of environmental effects) continuum. The basis for this requirement is evidence-based where the effects of an activity cannot necessarily be avoided or mitigated using conventional plantation management practices.

The NES-PF generally deals with non-site-specific effects, most notably erosion and sediment generation induced by forest clearance, and consequently does not include any site-bound overlays. Thus the NES leaves site-specific matters to be addressed by plan rules and those plan rules deal with these effects.

8.0 References

Abeil JM, Ozkundakci D, Hamilton DP, Miller SD 2011: Relationship[s between land use and nitrogen and phosphorus in New Zealand lakes. Marine and Freshwater Research 62: 162-175.

Baillie BR, Neary DG 2015: Water quality in New Zealand's planted forests: a review. New Zealand Journal of Forestry Science 45: 7.

Boothroyd IKG, Langer ER 1999. Forest harvesting and riparian management guidelines: a review. NIWA Technical report 56, NIWA, Hamilton, New Zealand.

Boothroyd IKG, Quinn JM, Langer ER, Steward G, Costley K 2004. Riparian buffers mitigate effects of pine plantation logging on New Zealand streams: 1. Riparian vegetation structure, stream geomorphology and periphyton. Forest Ecology and Management 194: 199-213.

Brockerhoff EG, berndt L, Jactel H 2005. Role of exotic pines in the conservation of the critically endangered New Zealand ground beetle *Holcaspis brevicula* (Coleoptera: Carabidae). New Zealand Journal of Ecology 29: 37-43.

Castelle AJ, Johnson AW, Connolly C 1994. Wetland and stream buffer size requirements: Ann. Review. J. Environ. Qual. 23, 878–882.

Clapcott, J.E., Young, R.G., Harding, J.S., Matthaei, C.D., Quinn, J.M. and Death, R.G. (2011) Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values. Cawthron Institute, Nelson, New Zealand.

Coker RJ, Fahey BD 1993: Road-related mass movements in weathered granite, Golden Downs and Motueka Forests, New Zealand. New Zealand Journal of Hydrology 31: 65-69.

Cooper AB, Thomsen CE 1988. Nitrogen and phosphorus in streamwaters from adjacent pasture, pine, and native forest catchments. New Zealand Journal of Marine and Freshwater Research 22: 279-291.

Davis M 2014. Nitrogen leaching losses from forests in New Zealand. New Zealand Journal of Forestry Science 44: 2-14

Davies-Colley, R. J. 1997: Stream channels are narrower in pasture than in forest. New Zealand journal of marine and freshwater research 31: 599-608.

Davies-Colley RJ, Quinn JM 1998. Stream lighting in five regions of North Island, New Zealand: control by channel size and riparian vegetation. New Zealand Journal of Marine and Freshwater Research 32: 591-605.

Duncan MJ 1995. Hydrological impacts of converting pasture and gorse to pine plantations and forest harvesting, Nelson, New Zealand. New Zealand Journal of Hydrology 34: 15-41.

Fahey B, Duncan M, Quinn J 2004: Impacts of Forestry. In: Freshwaters of New Zealand. Eds: J Harding, P Mosley, C Pearson and B Sorrell. NZ Hydrological Society and NZ Limnological Society, Christchurch NZ.

Fahey B, Marden M 2006: Forestry effects on sediment yield and erosion. In: The Pakuratahi land use study eds. G Eyles and B Fahey. Report prepared for Hawke's Bay Regional Council.

Fenning TM, Gershenzon J 2002. Where will the wood come from? Plantation forests and the role of biotechnology. Trends Biotechnol. 20, 291-296.

Fahey B, Stansfield B 2006: Forestry effects on water quality. In: The Pakuratahi land use study eds. G Eyles and B Fahey. Report prepared for Hawke's Bay Regional Council.

Gibbs, M. (2004). Relating terrigenous sediment deposition in Mahurangi Harbour to specific land use in the catchment: a pilot study. Auckland Regional Council Technical Publication 299. 33 p.

Gregory CE, Reid HE, Brierley GJ 2008. River recovery in an urban environment: Twin Streams catchment, Auckland, New Zealand. Physical Geography 29: 222-246.

Harding J, Quinn JM, Hickey CW 2000. Effects of mining and production forestry. In: New Zealand stream invertebrates: Ecology and implications for management. Eds: KJ Collier and MJ Winterbourn. NZ Limnological Society, Christchurch NZ.

Hicks BJ, Glova GJ, Duncan MJ 2004: Forestry Interactions – New Zealand. In: FISHES AND FORESTRY: Worldwide Watershed Interactions and Management. Eds: TG Northcote and GF Hartman. Blackwell Science, Oxford, UK.

Jackson CR, Sturm CA, Ward JM 2001. Timber harvest impacts on small headwater stream channels in the coast ranges of Washington. J. Am. Wat. Resour. Assn. 37, 1533–1549.

Jones H 2008. Coastal sedimentation: What we know and the information gaps, Environment Waikato Internal Series TR2008/12. 55 p.

Kelliher RM, Black TA, Price DT 1986: Estimating the effects of understorey removal from Douglas-fir forest using a two-layer canopy evapotranspiration model. Water Resources Research 22: 1891-1899.

MacLeod CJ, Blackwell G, Moller H, Innes J, Powlesand R 2008. The forgotten 60%: Bird ecology and management in New Zealand's agricultural landscape. New Zealand Journal of Ecology 32: 240-255.

Marden M 2012: Effectiveness of reforestation in erosion mitigation and implications for future sediment yields, East Coast catchments, New Zealand: A review. New Zealand Geographer 68: 24-35.

Marden M, Rowan D, Phillips C 2006: Sediment sources and delivery following plantation harvesting in a weathered volcanic terrain, Coromandel Peninsula, New Zealand. Australian Journal of Soil Research 44: 219-232.

McMahon S, Simcock R, Dando J, Ross C 1999. A fresh look at operational soil compaction. New Zealand Journal of Forestry 44: 33-37.

MEA 2005. Ecosystems and human well-being: Biodiversity synthesis (Millennium Ecosystem Assessment). Washington DC, World Resources Institute.

MFE 2013./ About GM in New Zealand, Ministry for the Environment (MFE), http://www.mfe.govt.nz/issues/managing-environmental-risks/organisms/gm-in-nz/about.html (last updated May 17, 2013).

Meleason MA, Quinn JM 2004. Influence of riparian buffer width on air temperature at Whangapoua Forest, Coromandel Peninsula, New Zealand. For. Ecol. Manage., Cummins, K.W., 1993. Riparian stream linkages: in-stream issues. In: Bunn, S.E, Pusey, B.J., Price, P. (Eds.), Ecology and Management of Riparian Zones in Australia, Marcoola, Queensland, LWRRDC, Canberra and CCISR, Griffith University.

Morrisey, D.J.; Burt, K.; Funnell, G.A.; Hume, T.M.; Kemp, C.L.S.; Ovenden, R.; Smith, R.K.; Swales, A. (1999). Ecological monitoring for potential effects of forestry activity on the intertidal habitats of Whangapoua Harbour. Annual Report 1998–1999 and summary of results 1993–1999. NIWA Client Report ERN90202/1. 85 p.

Morrison MA, Lowe ML, Parsons DM, Usmar NR, McLeod IM 2009. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. New Zealand Aquatic Environment and Biodiversity Report No. 37. 100 p.

Norton DA, Miller CJ 2000. Some issues and options for the conservation of native biodiversity in rural New Zealand. Ecological Management and Restoration 1: 29-37.

Ogden J, Braggins J, Stretton K, Anderson S 1997. Plant species richness under Pinus radiata stands on the central North Island volcanic plateau, New Zealand. New Zealand Journal of Ecology 21: 17-29.

Pawson SM, Ecroyd CE, Seaton R, Shaw WB, Brockerhoff EG 2010. New Zealand's exotic plantation forests as habitats for threatened indigenous species. New Zealand Journal of Ecology 34: 342-355.

Quinn, J. M.; Cooper, A. B.; Davies-Colley, R. J.; Rutherford, J. C; Williamson, R. B. 1997a: Landuse effects on habitat, periphyton, and benthic invertebrates in Waikato hill country streams. New Zealand journal of marine and freshwater research 31: 579-578.

Quinn JM, Boothroyd IKG, Smith B. 2004. Riparian buffers mitigate effects of pine plantation logging on New Zealand streams: 2. Invertebrate communities. Forest Ecology and Management 191: 129-146.

Rowe DK, Smith J, Quinn J, Boothroyd I. 2002: Effects of logging with and without riparian strips on fish species abundance, mean size, and the structure of native fish assemblages in Coromandel, New Zealand, streams. New Zealand Journal of Marine and Freshwater Research 36: 67-79.

Rowe LK 2003. Land use and water resources: A comparison of streamflow from New Zealand catchments with different vegetation covers. Report prepared for Ministry for the Environment.

Stroud, M.J. (2003). Modelling long-term daily sediment loads to the Mahurangi Estuary. NIWA report number HAM2003-144 prepared for Auckland Regional Council. 23 p. Project Number: ARC04204

Stroud, M.J.; Cooper, A.B. (1997). Modelling sediment loads to the Mahurangi estuary. NIWA report number ARC60211 prepared for Auckland Regional Council. 41p. Project Number: ARC60211.

Thompson RM, Phillips NR, Townsend CR 2009. Biological consequences of clear-cut logging around streams – moderating effects of management. Forest Ecology and Management 257: 931-940.

USDA Foreign Agricultural Service 2010. GAIN Report: New Zealand – Biotechnology – GE Plants and Animals.

Whitehead D, Kelliher FM 1991: Modelling of the water balance of a small Pinus radiata plantation. Tree Physiology 6: 17-33.

Yao RT, Barry LE, Wakelin SJ, Harrison DR, Magnard A, Payn TW 2013. Planted Forests. In: Ecosystem services in New Zealand – conditions and trends. Ed. JR Dymond.

Appendix 1

Results of analysis of NES-PF and ECOP

Forestry activity	Activity Status and Rules
	NES-PF

AFFORESTATION
Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.

NES-PF – Activity Status and Rules

Permitted activities
Afforestation is a permitted activity in:
• Green, Yellow and Orange zones; or
• Dark Orange and Red zones where afforestation involves less than two hectares or 10% of the afforestation activity, whichever is the lesser; and
• where the following permitted activity conditions are met:

• Wilding tree risk
- Afforestation of conifer species in an area with a wilding spread risk calculator score of 11 or less, or a sterile cultivar.
- Afforestation must not occur within a significant natural area, or and outstanding natural feature or landscape.

• Afforestation must not occur within the following setbacks:
a) Adjoining property under different ownership: 10 m
b) Adjoining existing dwelling under different ownership: The greater of: (i) 40m; or (ii) where vegetation could shade the dwelling between 10am and 2pm on the shortest day of the year (except where topogaphy already causes shading);
c) Urban/residential, Industrial, Commercial zones, and Papakainga: 30m
d) Afforestation must not occur where vegetation could shade a paved public road between 10 am and 2 pm on the shortest day of the year and icing is likely to occur; except where topography already causes shading.
e) Perennial river of stream with bank full channel width of <3m, minimum horizontal setback distance is 5m
f) Perennial river of stream with bank full channel width of >=3m, minimum horizontal setback distance is 10m
g) Wetlands larger than 0.25ha minimum horizontal setback distance is 5m.
h) Lakes larger than 0.25ha minimum horizontal setback distance is 10m.
i) Coastal marine area minimum horizontal setback distance is 30m.
j) Outstanding freshwater bodies (as defined in the National Policy Statement for Freshwater Management (2014) (NPS-FM))

Restricted discretionary activities
Afforestation is a restricted discretionary activity and a consent is required in:
• the Dark Orange and Red Zones, where afforestation involves more than two hectares or 10% of the afforestation activity, whichever is the lesser; and
• any area where permitted activity conditions cannot be met.

Matters to which discretion is restricted:
Wilding risk (district matters)
• Forest species
• Mitigation action to restrict wilding tree spread
Setbacks (regional matters)
• Effects on biodiversity and aquatic and coastal environments;
Setbacks (district matters)
• The effects on affected landowners, dwellings or urban/residential, Commercial, Industrial zones, and Papakaianga.
• Icing or shading effects on the road

Where afforestation is restricted discretionary because it is located on Dark Orange or Red Zone land, then discretion must be restricted to the matters that address effects from erosion and sedimentation.
Erosion and sedimentation (regional matters)
• Effects of afforestation on erosion and sedimentation under standard plantation forest regime, including effects on aquatic ecosystem (freshwater and coastal).
• Measures to avoid, remedy or mitigate erosion including:
o planting location and species,
o requirements to address geotechnical and slope stability effects of infrastructure location;

NES-PF – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
Increased environmental and property hazard	3	3	3	3	3	15
Damage to archaeological features	3	3	3	3	3	15
Degradation of significant terrestrial/ wetland biodiversity	3	3	3	3	3	15
Compromise to future environmental potential	3	3	3	2	3	14
Landscape/ amenity effects	3	3	3	3	3	15
Wilding pine spread	3	3	3	3	3	15
TOTAL SCORE (per criterion)	18	18	18	17	18	89

Industry ECOP – Rules, directives and guidelines

Rules
• Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before planting starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies.
• Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols.
• Communicate operational requirements verbally and in writing before planting starts to ensure personnel are aware of their environmental obligations.
• Comply with operational specifications.
• Meet setback requirements around restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas.
• Leave a horizontal setback of at least a 5m each side of all permanently flowing streams.
• Do not plant where harvesting will not be possible without serious adverse effects.
• Do not plant spread-prone species on sites where there is a high risk of uncontrollable wilding spread beyond the boundaries of the plantation. Use Wilding Risk Calculator.
• Remove all rubbish from the forest and dispose in a legally and environmentally acceptable way
• Undertake a post-operational audit upon completion of job.

Guidelines (Where safe and applicable)
• Consider conducting a social and environmental impact assessment when planting new areas outside existing forest boundaries.
• Consider appropriate species, patterns and layout when planting areas with high visual values and/or with important recreational values.
• Increase riparian setbacks where topographical, reserve features, stream size or sensitive boundaries and identifiable future harvesting complications indicate greater margins are needed.

Industry ECOP – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
• Increased environmental and property hazard	1	1	3	1	1	7
Damage to archaeological features	3	3	3	2	3	14
Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
Compromise to future environmental potential	3	2	3	1	2	11
Landscape/ amenity effects	3	3	3	1	2	12
Wilding pine spread	3	3	3	2	3	14
TOTAL SCORE (per criterion)	16	15	18	9	14	72

EARTHWORKS
Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction, landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.

NES-PF – Activity Status and Rules

Permitted activities
Earthworks are permitted:
• in Green and Yellow zones;
• in an Orange Zone where the slope of the land is less than 25 degrees;
where the following permitted activity conditions are met:
• Notice of commencement
Regional and district councils must be notified at least 20 working days and no more than 60 working days before earthworks operations start, unless this requirement is waived by the relevant council.
Councils may reduce this notice period at their discretion.
• Road widening and realignment for safety purposes
Road widening or realignment for safety purposes is permitted in all zones where:
- the road is not being upgraded to increase its carrying capacity or allow use by a heavier class of vehicle;
- road widening and realignment use best practice benching and compaction techniques in accordance with the New Zealand forest road engineering manual (NZFOA, 2012 – "NZFOA road engineering manual").
- road widening and realignment is on slopes over 35 degrees, fill material must be end hauled, in accordance with the NZFOA road engineering manual, section 4.3.1-3;
- overburden is placed in a way that meets the spoil conditions;
- the volume moved is more than 5 000 m3 per activity area;
- a record of any road widening or realignment for safety purposes is maintained and is available for inspection by the relevant council.
• Requirement to prepare an Erosion and Sediment Control Plan
- An Erosion and Sediment Control Plan (ESCP) must be prepared that assesses and addresses the
[Incomplete summary of provisions - see NES document]

NES-PF – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
Sediment discharge to waterways	3	3	3	2	3	14
Erosion, soil loss or damage to soil structure	3	3	3	2	3	14
Damage to archaeological features	3	3	3	3	3	15
Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
TOTAL SCORE (per criterion)	6	6	6	4	6	28

Industry ECOP – Rules, directives and guidelines

General rules
• Earthworks must be planned, designed, supervised and constructed by appropriately trained personnel.
• Comply with applicable council requirements, resource consent conditions, historic places trust authority and any other legal requirements, including mining regulations for quarries and the building code for structures.
• Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before an operation starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies.
• Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols.
• Design all earthworks appropriate to the soil type, topography, climatic conditions and anticipated traffic usage.
• Employ engineering expertise, to design or project manage, when prudent to do so e.g. large earthworks projects, quarries or operations in high-risk areas.
Operational
• Communicate operational requirements verbally and in writing before an operation starts to ensure personnel are aware of their environmental obligations.
• Comply with operational specifications.
• Make every reasonable effort to avoid damage to restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas.
• Do not damage, modify or destroy archaeological sites without approval.
• Place debris where it will not affect sensitive features, zones or destabilise the site.
• Keep machinery out of waterways and riparian margins unless authorised.
• No earthworks within 5m of permanent waterways except at designated crossings or water access points or where topographical constraints leave no alternative.
• Earthworks should be stable or stabilised using recognised engineering and vegetative techniques.
• Do not incorporate slash or other organic material into steep fill batters.
• Install correctly designed waterway crossing structures, sediment traps and cut-off spacing according to local soil, rainfall and topographic conditions and as work progresses.
• Remove all rubbish from the forest and dispose in a legally and environmentally acceptable way.
• Monitor the effects of the activity during an operation, on completion, and where necessary on a routine basis thereafter to ensure operational and compliance specifications have been met.
• Wash machinery where weed transfer is an identified risk.

Industry ECOP – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
Sediment discharge to waterways	3	3	3	1	3	13
Erosion, soil loss or damage to soil structure	3	3	3	1	3	13
Damage to archaeological features	3	3	3	2	3	14
Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
TOTAL SCORE (per criterion)	6	6	6	2	6	26

HARVESTING
Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).

NES-PF – Activity Status and Rules

Permitted Activities
Harvesting is a permitted activity in Green, Yellow and Orange zones provided permitted activity conditions listed below are met.

Low intensity harvesting
Low intensity harvesting is permitted in all zones where:
• a minimum of 75% canopy closure is maintained at all times for any given hectare of forest land;
• all other permitted activity conditions for harvesting are met.

Conditions include:
• Notice of commencement
Regional and district councils must be notified at least 20 working days and no more than 60 working days before harvesting operations start. Councils may reduce this notice period at their discretion.
• Harvest Planning
- A Harvest Plan must be prepared that assesses and addresses the operational risks to the environment.
- The Harvest Plan must be prepared in accordance with the prescribed template.

Post harvest decommissioning
• Decommission the site to appropriate standard.
• Ensure water and sediment controls are in place and maintained in effective operating condition until site is revegetated, rehabilitated or otherwise stable.
• Haul tracks are properly decommissioned.
• Slash and "birds nests" stabilised.
• Remove all rubbish from site and dispose in a safe and legally acceptable way.
Guidelines (Where safe and applicable)
Operational
• Avoid deviations to prepared harvest plans without approval, where relevant e.g. from an operational supervisor.
• Undertake work in suitable weather for the site conditions.
• Avoid damage to standing crop during production thinning operations.
• Select harvesting machinery that best suits the constraints of the harvest plan:
- Increased tower height of haulers to gain greater lift and suspension of logs
- Employ mechanical carriages capable of fully suspending logs above sensitive areas such as waterways
• Swing yarders that can operate in confined areas decreasing the requirements for large landings, or enabling roadside landings.
• Ground based systems suited to soil type e.g. tracked skidders or excavators with low ground pressure for easily compacted soils such as clays.
• Aim for extraction using techniques that achieve suspension of the butt end of the log.
• Follow landscape mitigation principles, where documented as part of operational plan (refer to Operational Planning BEP).
• Consider the benefits of wider riparian setbacks.
• Avoid trimming stems in water channels or flood ways or riparian areas.
• Consider use of debris traps where in-stream slash removal is unachievable.
• Instigate monitoring and maintenance programmes appropriate to the nature of the logging and its environmental risk.
• Decompact (rip) landings after use if not required for future.
Post harvest decommissioning
• Decommission the site to appropriate standard.
• Ensure water and sediment controls are in place and maintained in effective operating condition until site is revegetated, rehabilitated or otherwise stable.

NES-PF – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
Damage to archaeological features	3	3	3	3	3	15
Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
Erosion or damage to soil structure	3	3	3	2	3	14
Sediment discharge to waterways	3	3	3	2	3	14
Deposition of woody debris into waterways	3	3	3	3	3	15
Total score (per criterion)	15	15	15	12	15	72

Industry ECOP – Rules, directives and guidelines

Rules (Compulsory)
General rules
• Harvesting must be planned, supervised and undertaken by appropriately trained personnel.
• Comply with applicable council requirements, resource consent conditions, historic places trust authority and any other legal requirements.
• Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before an operation starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies.
• Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols.
• Communicate operational requirements verbally and in writing, before an operation starts, to ensure personnel are aware of their environmental obligations.
Operational
• Comply with operational specifications.
• Do not destroy, damage or modify archaeological sites without approval.
• Make every reasonable effort to avoid damage to restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas.
• Do not use waterways as extraction corridors or routes.
• Install appropriate water and sediment controls and prevent runoff flowing directly into waterways. Appropriate water control can be

Industry ECOP – Risk assessment

Associated potential effects	Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
Damage to archaeological features	2	3	3	1	2	11
Degradation of significant terrestrial/ wetland biodiversity	3	2	3	1	2	
Erosion or damage to soil structure	2	2	3	2	3	12
Sediment discharge to waterways	3	3	3	2	3	14
Deposition of woody debris into waterways	3	3	3	2	3	14
Total score (per criterion)	13	13	15	8	13	51

		NES-PF						Industry ECOP						
Forestry activity	**Activity Status and Rules**	*Associated potential effects*	**Risk assessment**					**Rules, directives and guidelines**	*Associated potential effects*	**Risk assessment**				
	NES-PF		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensiveness**	**TOTAL SCORE (effect)**			**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensiveness**	**TOTAL SCORE (effect)**
MECHANICAL LAND PREPARATION *Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the earthworks rules.*	**Permitted activities** Mechanical land preparation is permitted: • in Green and Yellow zones; • in Orange and Red zones where the slope is less than 25 degrees; • in Orange and Red zones where the slope is greater than 25 degrees but the technique used affects the subsoil (for example, deep downhill ripping or giant discing); and • where the following permitted activity conditions are met. Conditions include: • ~~Activity must not be undertaken in orange and red zones where the slope is greater than 25 degrees~~ The activity must not be undertaken in Orange and Red zones where the slope is greater than 25 degrees, if the technique being used affects the subsoil (for example, deep downhill ripping or giant discing). • Methods Mechanical land preparation must be carried out parallel to the contour, where practical (except roller crushing and downhill ripping). - Where mechanical land preparation does not follow the contour, run-off control measures must	**Erosion or damage to soil structure**	3	3	3	2	3	**14**	**Rules (Compulsory)** General rules • Mechanical land preparation must be planned, supervised and undertaken by appropriately trained personnel. • Comply with applicable council requirements, resource consent conditions, historic places trust authority and any other legal requirements. • Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before an operation starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies. • Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols. **Operational** • Communicate operational requirements verbally and in writing before an operation starts, to ensure personnel are aware of their environmental obligations. • Comply with operational specifications. • Minimise soil disturbance except where v-blading, ripping and mounding are being carried out to ameliorate specific adverse soil properties. These operations must recognise site and topographical constraints. • Undertake work in suitable weather for the site conditions. • Make every reasonable effort to avoid damage to restricted areas e.g. native vegetation, protected riparian strips, historic and	• **Erosion or damage to soil structure**	3	2	3	1	3	**12**
		Damage to archaeological features	3	3	3	3	3	**15**		**Damage to archaeological features**	2	3	3	1	2	
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	**14**		**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	2	2	**12**
		Discharge of sediment and contaminants into waterways	3	3	3	2	3	**14**	**Guidelines (Where safe and applicable)** Operational • Leave an undisturbed buffer zone around identified protected areas and at least 5m adjacent to permanently flowing streams. • Consider enlarged riparian areas where appropriate. • Cultivate or rip landing sites across the slope and ensure that water does not accumulate in fill areas. • Operate along the contour, to minimise runoff being concentrated down cultivated lines. Where unavoidable, limit downhill runs to a maximum continuous length of 50 metres. • Where soil properties and rainfall predispose, align slash windrows along the contour of sloping land and within broad valley floors, to help trap and filter sediment. • Blade or rake at least one line on the contour along the lower boundary of operations to help contain sediment within the work site and prevent runoff concentration at low points or gullies. • Wash machinery where weed transfer is an identified risk.	**Discharge of sediment and contaminants into waterways**	3	2	3	1	3	**12**
		Total score (per criterion)	**12**	**12**	**12**	**9**	**12**	**57**		**Total score (per criterion)**	**11**	**9**	**12**	**5**	**10**	**36**
PRUNING AND THINNING TO WASTE *Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations that thin in excess of this limit are likely to have similar effects to harvesting operations and fall within the definition of harvesting.* *Thinning-to-waste operations leave the felled trees in situ. Note: Production thinning involves the removal of thinned trees for sale and falls within the definition of harvesting.*	**Permitted activities** Pruning and thinning-to-waste are permitted in all zones, provided all permitted activity conditions are met. Conditions include: Slash - Debris from pruning and thinning-to-waste must not be deposited in a perennial water body or where it may enter a perennial water body, if it has the potential to mobilise under flood flows and: • block or dam stream flow; or • divert flow into stream banks in a way that is likely to cause erosion; or • damage downstream infrastructure, property or receiving environments; or • cause significant adverse effects on aquatic habitat. Slash should be removed from a water body only if it is safe and practicable to do so. **Controlled activities** Pruning and thinning-to-waste are controlled in all zones where permitted activity conditions are not met. If a consent is applied for, the council must grant the consent and can impose consent conditions but only in relation to the matters listed below. • aquatic effects; • effects on stream flow; • erosion; • potential effects on downstream infrastructure, property or receiving environments; • effects on aquatic habitat.	**Deposition of woody debris into waterways**	3	3	3	2	3	14	**Rules (Compulsory)** • Comply with applicable council requirements, resource consent conditions, historic places trust authority and any other legal requirements. • Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before an operation starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies. • Communicate operational requirements verbally and in writing before the operation starts, to ensure personnel are aware of their environmental obligations. • Comply with operational specifications. • Make every reasonable effort to avoid damage to restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas. • Keep roads, tracks and access routes clear of slash. • Do not leave slash where it could divert or block a permanent waterway, water table or water control structure. • Remove slash from boundary fences, neighbouring properties, utilities etc. • Remove all rubbish from the forest and dispose in a legally and environmentally acceptable way. • Undertake a post-operational audit upon completion of job. **Guidelines (Where safe and applicable)** • Place thinning and pruning slash behind the first row of trees within the stand boundary • Fell trees away from sensitive features. • Remove slash and debris where required to comply with the operational specifications progressively rather than leaving it to when the operation is finished.	**Deposition of woody debris into waterways**	2	2	3	1	2	**10**
		Total score (per criterion)	**3**	**3**	**3**	**2**	**3**	**14**		**Total score (per criterion)**	**2**	**2**	**3**	**1**	**2**	**10**
FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters.* *Scope includes the extraction of alluvial gravel outside river beds. Earthworks and mechanical land preparation do not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to specific controls.*	**Permitted activities** Quarrying is permitted in all zones except Red Zone where the ESC identifies land as having the potential for severe or very severe earthflow or slump erosion, provided permitted activity conditions are met. Conditions include: • Notice of commencement District and regional councils must be notified at least 20 working days and no more than 60 working days before the first quarry operations start. • Visibility At the time of extraction, where a quarry is visible from an existing dwelling, an adjoining property under different ownership or a formed public road, no more than 5 000 m³ of material must be quarried per five-year period per activity site. • Property setbacks Unless written approval from the owner(s) and/or occupier(s) has been obtained: - no quarrying activity may be undertaken closer than 500 m to an existing dwelling under different ownership; - no excavated soil or overburden must be deposited within 20 m of an adjoining property under different ownership. • Regional setbacks Quarrying must not be undertaken within 20 m of a surface water body. • Fill or spoil Excavated soil regolith and overburden of the quarry product must not be deposited: - within 20 m of a surface water body; - within the area of any known plastic earthflow or other mass movement feature, where the deposition	**Sediment discharge to waterways**	3	3	3	2	3	14	**ECOP does not have rules or guidance on quarrying.**	**Sediment discharge to waterways,**	0	0	0	0	0	**0**
	Restricted discretionary activities Quarrying is restricted discretionary: • in all zones where property setback conditions cannot be met; • in a Red Zone where the ESC identifies land as having the potential for severe or very severe earthflow or slump erosion. If a consent is applied for, the council may decline or grant the consent and impose consent conditions. However, the council's ability to grant or decline the consent and to impose conditions is restricted to the matters listed below (refer to also)	**Erosion, soil loss or damage to soil structure**	3	3	3	2	3	**14**		**Erosion, soil loss or damage to soil structure**	0	0	0	0	0	**0**
		Damage to archaeological features	3	3	3	3	3	**15**		**Damage to archaeological features**	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	**14**		**Degradation of significant terrestrial/ wetland biodiversity**	0	0	0	0	0	**0**
		Total score (per criterion)	**6**	**6**	**6**	**4**	**6**	**28**		**Total score (per criterion)**	**0**	**0**	**0**	**0**	**0**	**0**
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.*	Permitted activities Replanting is a permitted activity in all zones, provided all permitted activity conditions are met. Conditions include the following setbacks from waterbodies: • 5 m from perennial river or stream with Bank full channel width < 3 m Except where a smaller setback is required to meet the conditions of a regional pest management strategy • 10 m from perennial river or stream with Bank full channel width ≥ 3 m Except where a smaller setback is required to meet the conditions of a regional pest management strategy • 5 m from wetlands larger than 0.25 ha • 10 m from lakes larger than 0.25 ha • 30 m from coastal marine area • 10 m from outstanding freshwater bodies (as defined in the NPS-FM) or surface water bodies subject to water conservation orders **Replanting adjacent to significant natural areas (SNA)** When replanting immediately adjacent to indigenous vegetation identified, mapped or scheduled in a district or regional plan as an SNA (or similar), replanting must take place no closer than the stump line of the previous crop. The Forest Manager must remove, at least every five years, all wilding conifer species that have established from the replanted area in wetlands and significant natural areas on the same property. **Restricted discretionary activity** Replanting is a restricted discretionary activity in all zones where permitted activity conditions are not met. Where replanting is restricted discretionary because it does not meet the permitted activity conditions, then discretion is reserved to the following matters: • Effects on biodiversity and aquatic and coastal environments; • species and location of replanting; • potential effects of future harvesting and earthworks activities on the adjacent surface water bodies, coastal water, or significant indigenous vegetation. The consent must apply only to the area that could not be replanted as a permitted activity.	**Increased environmental and property hazard**	3	3	3	3	3	**15**	**Rules (Compulsory)** • Comply with applicable council requirements, resource consent conditions, historic places trust authority and any other legal requirements e.g. governing planting location and setbacks. • Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before planting starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies. • Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols. • Communicate operational requirements verbally and in writing before planting starts to ensure personnel are aware of their environmental obligations. • Comply with operational specifications. • Meet set back requirements around restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas. • Leave a horizontal setback of at least a 5m each side of all permanently flowing streams. • Do not plant where harvesting will not be possible without serious adverse effects. • Do not plant spread-prone species on sites where there is a high risk of uncontrollable wilding spread beyond the boundaries of the plantation. Use Wilding Risk Calculator (refer Appendix I). • Remove all rubbish from the forest and dispose in a legally and environmentally acceptable way e.g. empty planter boxes and plastic liners should be removed from the site and recycled where possible. Untreated cardboard may be buried in the forest. • Undertake a post-operational audit upon completion of job. **Guidelines (Where safe and applicable)** • Consider conducting a social and environmental impact assessment when planting new areas outside existing forest boundaries. • Consider appropriate species, patterns and layout when planting areas with high visual values and/or with important recreational values. • Increase riparian setbacks where topographical, reserve features, stream size or sensitive boundaries and identifiable future harvesting complications indicate greater margins are needed.	**Increased environmental and property hazard**	3	3	3	2	3	**14**
		Damage to archaeological features	3	3	3	3	3	**15**		**Damage to archaeological features**	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	3	3	**15**		**Degradation of significant terrestrial/ wetland biodiversity**	3	3	3	2	3	**14**
		Compromise to future environmental potential	3	2	2	1	2	**10**		**Compromise to future environmental potential**	3	2	3	2	3	**13**
		Wilding pine spread	3	3	3	3	3	**15**		**Wilding pine spread**	3	2	3	3	3	**14**
		Total score (per criterion)	**3**	**3**	**3**	**3**	**3**	**11**		**Total score (per criterion)**	**3**	**3**	**3**	**2**	**3**	**14**
RIVER CROSSINGS *River-crossing involves the installation, construction, placement , use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.*	**Permitted activities** River crossings are permitted provided: • all the applicable general conditions are met; and • permitted conditions specific to the type of crossing (temporary crossings, culverts, single-span bridges, drift-decks and fords) are also met. Any crossing existing as at [the date the proposed NES-PF comes into force] that was lawfully established, including under a rule in a plan or by a resource consent, and that meets the following permitted activity rules is permitted: • effects on other structures and users (permitted activity conditions 2, 3 and 4 below); • fish passage; • erosion and sediment discharge from use; • maintenance; • single culverts – specific conditions relating to single culverts (permitted activity condition 7 below); • battery culverts – specific conditions relating to battery culverts (permitted activity condition 4 below). **Conditions include:** **General river-crossing conditions** • Notice of commencement The relevant regional council must be notified at least 20 working days and no more than 60 working days before the start of construction, placement or removal of any class of river crossing in a perennial stream (except for a temporary crossing). The council may waive, in writing, the requirement for notification for certain types of stream crossings or the time	**Sedimentation of the water column and bed of the river.**	3	3	3	3	3	**15**	**Rules (Compulsory)** General rules • Crossings must be planned, designed, supervised and constructed by appropriately trained personnel. • Comply with applicable council requirements, resource consent conditions, freshwater fisheries regulations and any other legal requirements e.g.; - Building consents are required for any bridge where fall height exceeds 1m (including collapse). - A civil/structural engineer (C.P.Eng) must approve structural designs where appropriate and perform inspection for recertification of existing bridges. - Fish passage must not be impeded by structures. • Selection and design of crossings must consider: - Waterway environmental values e.g. water quality, fauna - Waterway physical attributes e.g. size of waterway, catchment area and characteristics like topography and geology, bed and bank stability, and peak flows - Intended crossing use e.g. traffic volumes and type • Ensure important environmental values and restricted areas have been identified and clearly mapped or documented before the operations starts e.g. protected vegetation areas, public recreation areas, neighbouring properties and water bodies. • Consult with parties who are likely to be directly adversely impacted by operations – observe any established protocols. • Design all crossings appropriate to the soil type, topography, climatic conditions and anticipated traffic usage. • Employ engineering expertise to design, verify, inspect, certify or project manage, where legally required or otherwise prudent to do so	• **Sedimentation of the water column and bed of the river.**	3	3	3	2	3	**14**

Forestry activity	Activity Status and Rules	NES-PF							Industry ECOP	Industry ECOP						
		Associated potential effects	Risk assessment						Rules, directives and guidelines	Associated potential effects	Risk assessment					
	NES-PF		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)			Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
	Controlled activities The activity is a controlled activity, provided the follow conditions are met: 1. the crossing is not a ford; 2. the crossing complies with the following permitted general crossings conditions: a. notice of commencement; b. effects on other structures and users (permitted activity conditions 2, 3 and 4 above); c. fish passage; d. contaminant discharge from construction and removal activities (permitted activity conditions 2, 3 and 4 above); e. erosion and sediment discharge from use; f. maintenance; g. placement. Culvert-specific conditions 1. The culvert must pass a 5% AEP flood event. 2. The total height of the crossing crest is no more than 4 m above the bed measured at the inlet end, and the culvert position complies with the manufacturer's minimum height specifications. Bridge-specific conditions 1. The bridge crosses a river with a contributing catchment of less than 5 000 ha.	**Disruption of fish passage**	3	3	2	3	3	**14**	**Operational** • Communicate operational requirements verbally and in writing before an operation starts, to ensure personnel are aware of their environmental obligations. • Comply with operational specifications. • Close or control access to operational areas to prevent inadvertent unauthorised access. • Undertake work in suitable weather for the site conditions. • Ensure no contaminants enter waterways. • Avoid in-channel work during fish spawning season. • Make every reasonable effort to avoid damage to restricted areas e.g. native vegetation, protected riparian strips, historic and heritage sites, research areas. • Do not damage, modify or destroy archaeological sites without approval. Minimise machinery operating in the bed of the waterway. • Decommission temporary crossings after use. • Remove all rubbish from the forest and dispose in a legally and environmentally acceptable way. • Monitor the effects of the activity during an operation, on completion, and where necessary on a routine basis thereafter. Monitoring is to ensure the operational specifications or compliance requirements have been met. • Undertake a post-operational audit upon completion of job. • Instigate maintenance programmes appropriate to the nature of the structures and their environmental risk	• **Disruption of fish passage**	3	3	3	3	3	**15**
		Damage to the river bed and downstream infrastructure.	3	3	3	2	3	**14**	**Guidelines (Where safe and applicable)** • Programme earthworks to enable best use of seasonal conditions and stabilisation before use. • Confine disturbance to the immediate work site. • Use existing structures, where they are present, as a tool to assist in determining effective new structure requirements. • Wherever possible, crossings should be located perpendicular to waterway, with abutments on solid level ground on each bank. • Earthworks should be stable or stabilised using recognised engineering and vegetative techniques. • Locate earthworks to avoid unstable areas, sensitive features or unnecessary disturbance. • Avoid steep approaches to and from crossings. • Cross where waterway banks are solid and beds stable. • Consider use of slash racks to protect culverts where slash build up is expected. • Divert road/track runoff away from crossings using berms, cutouts, culverts or flumes. • Consider using bridges or low level crossings on larger waterways. • Construct fords for infrequent vehicle use, and to cross waterways that have hard streambeds, low flows and low in-stream values.	**• Damage to the river bed and downstream infrastructure.**	3	3	3	3	3	**15**
		Impediment to water flows	3	3	3	2	3	**14**		**Impediment to water flows**	1	1	3	1	1	**7**
		Loss of instream habitat (fords) and spawning habitat	3	2	2	2	2	**11**		**Loss of riparian and instream habitat (fords) and spawning habitat**	2	2	3	2	2	**11**
		Total score (per criterion)	**15**	**14**	**13**	**12**	**14**	**43**		**Total score (per criterion)**	**12**	**12**	**15**	**11**	**12**	**44**

General Conditions
Notwithstanding specific activity rules, all forestry activities are permitted, provided the following conditions are met.

Archaeological
Known archaeological sites
During afforestation, replanting, mechanical land preparation, harvesting, earthworks and quarrying activities, the modification or destruction of an archaeological site (as defined by the Heritage New Zealand Pouhere Taonga Act 2014) may occur only if it is carried out on the authority of and in accordance with the Heritage New Zealand Pouhere Taonga Act 2014. Unrecorded archaeological sites
The following procedures apply to any archaeological site exposed or identified before or during plantation forestry activities:
• All site works in the immediate vicinity of the discovery that will destroy, damage or modify the site must cease immediately.
• The area must be secured to prevent further disturbance until relevant Heritage New Zealand Pouhere Taonga authorisation has been obtained.
• Works must then be carried out in accordance with the authorisation.

Fuel
During any plantation forestry activity there must be no refuelling of machinery within surface water bodies or storing of fuel or refuelling where it might enter a surface water body.
Vegetation clearance and disturbance
Indigenous vegetation may be damaged, destroyed or removed provided it:
• has grown up under (or may have overtopped) managed forest species; or
• is within an area of felled planting (within the last rotation); or
• is within an area of regenerating cutover (that is, within five years of the harvest of the previous crop); or
• is vegetation overgrowing a pre-existing access way, including an existing track or access way within an significant natural area (SNA) (or similar); or
• is incidental damage to riparian vegetation that will readily recover within five years; or
• is incidental damage to indigenous vegetation this is adjacent to plantation forest, including indigenous vegetation at the edge of an SNA (or similar) or along an existing track that will readily recover within five years.

Dust
Discharge of dust to air from activities undertaken on the site is a permitted activity, provided any nuisance dust is contained within the boundaries of the property or properties under the same ownership or under the same management.

Noise
The noise from forestry activities at the notional boundary of the nearest dwelling, where that dwelling is under different ownership, except where approval from the adjoining owner(s) has been obtained, does not exceed:
• 55dBA (L eq) between 6 am and 10 pm; and
• 40dBA (L eq) between 10 pm and 6 am;
except forestry vehicles and machinery or equipment operated and maintained in accordance with the manufacturer's specifications in accordance with accepted best management practices.
Note: "Notional boundary" means, the legal boundary of the property on which any rural dwelling is located or a line 20 m from the dwelling, whichever point is closer to the dwelling.

Nesting times
Where indigenous bird species with a classification of Nationally Critical or Nationally Endangered (from the Department of Conservation's Conservation Status of New Zealand Birds, 2012 (Robertson et al, 2012)) are known to nest in areas where forestry operations are planned or under way, forest owners must have procedures to:
• identify nest sites and the nesting season;
• protect these sites from disturbance or undertake the activity outside of the nesting season.

Spatial bundling
For the purpose of determining the activity status of a proposed activity in circumstances where an activity crosses multiple Erosion Susceptibility Classification (ESC) zones, any overlap into a higher ESC zone must be disregarded provided:
• any discrete section of road within the highest ESC zone is equal to or less than 50 m (for earthworks);
• the total area of the overlap is equal to or less than the smaller of (all other activities):
o 2 ha;
o 10% of the total activity area.

Fish spawning
1. The bed of a permanently flowing river can be disturbed, provided all other activity-specific rules or consent conditions have been met, except where:
a. the New Zealand freshwater Fish Database indicates that one of the following species is present within 1 km of the reach of the stream where the disturbance is made; or
b. where a catch has not been recorded in the New Zealand freshwater Fish Database, the probability of one of the above species being present is greater than 0.5 under the River Environment Classification Predictive Fish Model 2014; and
c. the disturbance occurs during the corresponding peak fish spawning period:
[Refer to table of species]
2. For the purposes of this rule, the following activities are not considered to be bed disturbance:
a. fording by vehicles across the wetted river bed where the number of axle movements is less than 20 per day; and
b. partially suspended logs are hauled across the bed of a river less than 3m wide.
3. Where a freshwater fish survey has been undertaken by a suitably qualified person within the past 12 months at the site and the species has not been found, (1)(c) does not apply.

Species	Period
Redfin Bully	1 September to 31 October
Canterbury Galaxias	1 September to 31 October
Dwarf Galaxias	1 September to 31 October
Alpine Galaxias	1 September to 31 October
Lowland Longjaw Galaxias	1 September to 31 October
Dusky Galaxias	1 September to 31 October
Eldon's Galaxias	1 September to 31 October
Roundhead Galaxias	1 September to 31 October
Banded Kokopu	1 September to 31 October
Taieri Flathead Galaxias	1 September to 31 October
Gollum Galaxias	1 September to 31 October
Upland Longjaw Galaxias	1 September to 31 October
Koaro	1 April to 31 May
Giant Kokopu	1 May to 30 June
Stokell's Smelt	1 December to 31 January
Atlantic Salmon	1 May to 30 June
Brook Char	1 May to 30 June
Brown Trout	1 May to 30 June
Chinook Salmon	1 April to 31 May
Rainbow Trout	1 April to 31 May
Sockeye Salmon	1 March to 31 March

Slash Traps
Where slash cannot be safely or practicably removed from water bodies, and there is an assessed risk of slash mobilising and causing adverse effects, alternative measures, such as slash traps, being used to retain slash onsite as far as practicable.
The installation and use of slash traps is permitted provided the following conditions are met.
Constructed slash (debris) traps located across a water body being:
• designed and constructed to a standard appropriate for likely debris quantity and types and water flow
• located so as to avoid flooding of adjacent land, and in a position that allows access for maintenance
• regularly monitored for the build-up of debris and within five working days following any rainfall event in the upstream catchment that is likely to mobilise debris
• maintained free of accumulated debris – following storm events, accumulated debris being removed as soon as is practicable but no later than 20 working days of such accumulation occuring.

Controlled activities
Notwithstanding specific activity rules, all forestry activities are controlled if all permitted activity conditions are met except for those relating to nuisance dust, noise or nesting times.
If a consent is applied for, the council must grant the consent and its ability to impose consent conditions is restricted to the matters listed below.

Discretionary activities
All activities are discretionary where permitted activity conditions relating to archaeological sites, fuel, fish spawning, slash traps or indigenous vegetation disturbance are not met. If a consent is applied for, the council can decline or grant the consent and impose any consent conditions it deems appropriate.

Appendix 2

Results of analysis of Plan rules

B.O.P. Region Forestry activities	Activity Status and Rules	Associated potential effects	BOP Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensivene	TOTAL SCORE (effect)
*Definitions from NES	**Regional and District Plans reviewed:** **Bay of Plenty Regional Water and Land Plan; and** **Rotorua District Council Operative District Plan - Part 10 Rural Resources** **Whakatane Proposed District Plan - Chapter 17**							
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Permitted activities** **Bay of Plenty Regional Water and Land Plan** **Section** 9.5 - advisory note (2): The rules in this regional plan do not authorise the modification or disturbance of any archaeological, or registered waahi tapu sites within the area of the activity. Written authority from the New Zealand Historic Places Trust is required prior to any destruction, damage or modification of an archaeological or registered waahi tapu site or an area where there is reasonable cause to suspect there is an archaeological site. Should any artefacts, bones or any other sites of archaeological or cultural significance be discovered within the area affected by the activity, written authorisation should be obtained from the Historic Places Trust before any damage, modification or destruction is undertaken. **Rotorua District Plan** Rule R101.1.1 Actvities in the Rural A, B and D Zones Permitted Activity in Rural A and B Zone, Non-complying in Rural Zone D Agroforestry Plantation forestry including harvesting other than in the covenanted areas along the margins of Lakes Tikitapu and Rotokakahi as shown on DPS 54801. R10.2 Performance Standards for Permitted Actvities Plantation Froestry in the Rural A, B and F Zones	**Increased environmental and property hazard**	3	2	2	3	2	**12**
	Rotorua District Plan Actvities in Rural B1 Zone Prohibited Actvity - Agroforestry and Plantation Forestry Actvities in Rural F Zone Permitted Actvity - Plantation Forestry	**Damage to archaeological features**	3	3	3	3	3	**15**
	Whakatane District Plan Rule17.2.1 Activities in the Rural Ōhiwa Zone/ Rural Coastal Zone/ ONFL /SAL New production forestry <5ha established after 28/06/13: Permitted Activity in Rural Ōhiwa Zone and SAL, Discretionary in Rural Coastal Zone/ ONFL	**Degradation of significant terrestrial/ wetland biodiversity**	2	2	2	2	2	**10**
		Compromise to future environmental potential	2	2	2	2	2	**10**
		Landscape/ amenity effects	3	2	2	2	3	**12**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	**13**	**11**	**11**	**12**	**12**	**59**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction,* *landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	9.2.4 Permitted Activity Standard - Accredited Forestry Operators (2) Earthworks associated with forestry activities that do not exceed the permitted limits stated in Table 33. **See also QUARRYING provisions**	**Sediment discharge to waterways**	3	3	3	3	3	**15**
		Erosion, soil loss or damage to soil structure	3	3	3	3	3	**15**
	Whakatane District Plan Rule17.2.1(5) Activities in the Rural Ōhiwa Zone/ Rural Coastal Zone/ ONFL /SAL: Any modification of any natural landform, including mining, quarrying and earthworks less than or equal to 400m2 and 200m3 in any 12 month period - Permitted Activity; Greater than this threshold - Discretionary	**Damage to archaeological features**	3	3	3	2	3	**14**

B.O.P. Region Forestry activities	Activity Status and Rules	Associated potential effects	BOP Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensivene	TOTAL SCORE (effect)
*Definitions from NES	**Regional and District Plans reviewed:** **Bay of Plenty Regional Water and Land Plan; and** **Rotorua District Council Operative District Plan - Part 10 Rural Resources** **Whakatane Proposed District Plan - Chapter 17**							
	Rotorua District Council Rule R10.2.10A Earthworks in Rural B1 Zone As Permitted Activities, earthworks that comply with the following conditions: i) The earthworks do not disturb any recorded heritage feature including historic places, archaeological sites and waahi tapu; and ii) The earthworks are on slopes that do not exceed 25°; and iii) The earthworks are outside an ephemeral watercourse; and iv) The fill is cleanfill and has a vertical dimension that does not exceed 600mm; and v) The excavation has a vertical dimension that does not exceed 2500mm (2.5 metres); and vi) The earthworks do not exceed 500m³. Where one or more of the above conditions for earthworks are not met, a consent to a Restricted Discretionary Activity shall be required. Rules R10.1.1.(1/2/3/4) Earthworks in the Rural A, B,C, D, E and F Zones all refer to Appendix I of the Plan which has rules, relating to Stockpiling , Earthworks involving cleanfill and Disposal of other material which do not appear relevant	**Degradation of significant terrestrial/ wetland biodiversity**	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	**12**	**12**	**12**	**10**	**12**	**58**
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Bay of Plenty Regional Water and Land Plan** **9.2.3 Land and Soil Disturbance by Vegetation Clearance Advisory Note** 1 Indigenous vegetation may be classified as significant by the relevant city or district council and protected under its district plan. Compliance with the provisions of this regional plan does not remove the need to also comply with district plan provisions. 2 Where vegetation clearance does not result in the disturbance of land or soil, the vegetation clearance activity is not controlled by this regional plan. **9.2.3 Permitted Activity Standard** The disturbance of land and soil resulting from vegetation clearance, where: 1. The activity is not: (a) on land with a dominant slope greater than 35 degrees; or (b) In the Erosion Hazard Zone; or (c) In the Coastal Margin;	**Damage to archaeological features**	3	3	3	2	3	**14**
	Whakatane District Plan Harvesting of existing plantation forestry - Permitted Activity. In a SAL and Rural Ōhiwa Zone ,Council shall exercise its control over; a. staging of planting and harvesting; b. landscaping to screen cuts and fills as seen from public roads and reserves; c. the alignment of the access routes relative to the natural contour; d. the replanting of the production forestry within the first planting season after harvesting; and e. the implementation of harvesting areas that is of a shape that reflects the natural landform and not necessarily cadastral boundaries.See Section 3.74.6. 17.6 OTHER METHODS 17.6.1.1 The Council will: a. The Council will encourage production forestry operators, when planning new forests or re-establish forests, to consider the landscape sensitivities and possible methods to reduce these as set out in Section 2.2 Landscape Planning Principles of the New Zealand Environmental Code of Practice for Plantation Forestry Version 1, 2007. [Sub	**Degradation of significant terrestrial/ wetland biodiversity**	3	3	3	3	3	**15**
		Erosion or damage to soil structure	3	2	3	3	3	**14**
	Rule 84 Permitted – Minor Disturbance of Vegetation in Wetlands Associated with Cable Logging by Accredited Forestry Operators	**Sediment discharge to waterways**	3	2	2	2	2	**11**
	Rotorua District Plan Rule R101.1.1 Actvities in the Rural A, B and D Zones Permitted Actvitiy in Rural Zones A and B and Non-Complying Activity in Rural D Zone Plantation forestry including harvesting other than in the covenanted areas along the margins of Lakes Tikitapu and Rotokakahi as shown on DPS 54801 Permitted Actvity in Rural Zones A, and Discretionary Actvity in Rural B and C Zones Clearance of discrete areas of up to 1000m2 of regenerating secondary indigenous vegetation cleared for	**Deposition of woody debris into waterways**	3	2	3	2	3	**13**
		Total score (per criterion)	**15**	**12**	**14**	**12**	**14**	**67**
MECHANICAL LAND PREPARATION *Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping,*	**As per harvesting and eathworks**	**Erosion or damage to soil structure**	3	2	3	3	3	**14**

B.O.P. Region Forestry activities	Activity Status and Rules	Associated potential effects	BOP Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensivene	TOTAL SCORE (effect)
*Definitions from NES	Regional and District Plans reviewed: Bay of Plenty Regional Water and Land Plan; and Rotorua District Council Operative District Plan - Part 10 Rural Resources Whakatane Proposed District Plan - Chapter 17							
		Damage to archaeological features	3	3	3	2	3	
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	1	3	12
		Discharge of sediment and contaminants into waterways	3	3	3	3	3	15
		Total score (per criterion)	12	10	12	9	12	41
PRUNING AND THINING TO WASTE *Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a*	As per harvesting	Deposition of woody debris into waterways	3	2	3	2	3	13
		Total score (per criterion)	3	2	3	2	3	13
FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters.* *Scope includes the extraction of alluvial gravel outside river beds. Earthworks and mechanical land preparation do not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to specific controls.*	**Permitted activities** **9.2.1 Earthworks and Quarries Rule 1 Permitted - Earthworks and Quarries** **T**he disturbance of land and soil as a result of earthworks or a quarry, where the activity does not exceed the limits in Table 28 within any 12 month period is a permitted activity subject to the following conditions [see plan] **Controlled activities** 9.2.1 Earthworks and Quarries Rule 1A Controlled - Earthworks and Quarries The disturbance of land and soil as a result of earthworks or a quarry, where the activity is; 1 Not in the Riparian Management Zone; 2 Not in the Coastal Margin; 3 Not in the Erosion Hazard Zone; and does not exceed the limits in Table 29 within any 12 month period is a controlled activity, subject to the following terms and conditions: (a) Ephemeral Flowpath not in the Erosion Hazard Zone, where land slope 0 to 25° controlled limits are exposed area no greater than 1,000 m² and volume no greater than 500 m³ per individual flowpath; (b) Land not in the Riparian Management Zone, an ephemeral flowpath, the Coastal Margin, or the Erosion Hazard Zone, where land slope 0 to 15° controlled limits are 2 ha and 20,000m³; where land slope is >15 to 25° controlled limits are 5000m² and 10,000m³; where land slope is >25 to 35° controlled limits are 1000m² and 5000m³. **Restricted discretionary activities** 9.2.1 Earthworks and Quarries Rule 1B Restricted Discretionary - Earthworks and Quarries The disturbance of land and soil as a result of earthworks or a quarry, where the activity does not exceed limits in Table 30 within any 12 month period is a restricted discretionary activity. **Discretionary activities** 9.2.1 Earthworks and Quarries Rule 1C Discretionary – Earthworks and Quarries The disturbance of land and soil as a result of earthworks or a quarry, where the activity: 1 Is not permitted by a rule in this regional plan; and 2 Is not a controlled activity under a rule in this regional plan, and 3 Is not a restricted discretionary activity under a rule in this regional plan; Is a discretionary activity. And: Table 28 where 1 Any earthworks: (a) In the Erosion Hazard Zone, or (b) On slopes greater than 35 degrees; or (c) On coastal land between 0-50 metres of the Coastal Marine Area on Sand Dune Country; or (d) On coastal land between 0-20 metres of the Coastal Marine Area on the Coastal Margin; are discretionary activities under Rule 1C.	Sediment discharge to waterways	3	3	3	2	3	14
		Erosion, soil loss or damage to soil structure	3	3	3	3	3	15
		Damage to archaeological features	3	3	3	2	3	
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	3	3	15
		Total score (per criterion)	12	12	12	10	12	44

B.O.P. Region Forestry activities	Activity Status and Rules	Associated potential effects	BOP Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensivene	TOTAL SCORE (effect)
*Definitions from NES	Regional and District Plans reviewed: Bay of Plenty Regional Water and Land Plan; and Rotorua District Council Operative District Plan - Part 10 Rural Resources Whakatane Proposed District Plan - Chapter 17							
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within*	**No specific rules observed**	**Increased environmental and property hazard**	3	2	2	3	2	**12**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	2	2	2	2	2	**10**
		Compromise to future environmental potential	2	2	2	2	2	**10**
		Wilding pine spread	0	0	0	0	0	**0**
		Total score (per criterion)	**10**	**9**	**9**	**10**	**9**	**47**
RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.*	Permitted Activities Rule 59 Permitted – Culverts and Culvert Extensions The use, erection, reconstruction, placement, alteration or extension of a culvert in, on or under the bed of a river, stream, or lake, and associated bed disturbance, where the culvert: 1 Is not located where the adjacent land slope is greater than 35°, and 2 Is not located within any Urban Area or Settlement, or within one (1) kilometre upstream of any Urban Area or Settlement, and 3 Is not located in a wetland, 4 Is not located in a Land Drainage Canal; Is a permitted activity subject to the following conditions (refer to plan): Rule 60 Permitted – Single Span Bridges, or Single Span Pipe Bridges The use, erection, reconstruction, placement, alteration or extension of a single span bridge or single span pipe bridge over the bed of a river, stream, or lake, where the structure: 1 Is not located where the adjacent land slope is greater than 35°, and 2 Is not located within any Urban Area or Settlement, or within one (1) kilometre upstream of any Urban Area or Settlement, and 3 Is not located in a wetland, and 4 Is a bridge that crosses a waterway with a contributing catchment of no greater than 100 hectares, and 5 Is not located in a Land Drainage Canal; and associated bed disturbance, is a permitted activity subject to the following conditions (refer to plan):	**Sedimentation of the water column and bed of the river**	3	3	3	2	3	**14**
		Disruption of fish passage	3	3	3	1	3	**13**
		Damage to the river bed and downstream infrastructure.	3	2	3	2	3	**13**
		Impediment to water flows	3	3	3	2	3	**14**
		Loss of instream habitat (fords) and spawning habitat	3	2	3	2	2	**12**
		Introduction of weeds/pests	0	0	0	0	0	**0**
		Total score (per criterion)	**15**	**13**	**15**	**9**	**14**	**66**

Canterbury Region			Canterbury Plan provisions					
Forestry activities	**Activity Status and Rules**	**Associated potential effects**	**Risk assessment**					
***Definitions from NES**	**Regional and District Plans Reviewed: Canterbury Land and Water Regional Plan Hurunui District Plan - A1 Environmental Amenity, A2 Landscape and A7 Natural Environment**		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensivenes**	**TOTAL SCORE (effect)**
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Hurunui District Plan** **A1.2.3 Planting setbacks** (a) Forestry shall not be located within 50 metres of a dwellinghouse or principal building on a separate lot under different ownership. (b) No dwellinghouse shall be located closer than 50 metres from a forestry plantation on a separate lot under different ownership. (c) Forestry planting shall not be located within 10 metres from the boundary of any title held in different ownership, except where that adjoining title is managed jointly with the land being planted. Note: Refer to Rule B2.2(b) for the setback distance for forestry within the Coastal Environment Management Area	**Increased environmental and property hazard**	3	2	2	3	2	**12**
	Hurunui District Plan - Note: All archaeological sites (whether recorded or unrecorded) are protected under the provisions of Section 10 of the Historic Places Act 1993 and cannot be destroyed damaged or modified without the consent to the Historic Places Trust. A8.2 Conditions for permitted activities Note: Refer to Policies 8.1, 8.2 and 8.6 A8.2.1 No feature listed in the Schedule of Heritage Features (A8.1) may be altered, modified, (unless	**Damage to archaeological features**	3	3	3	2	3	**14**
	5.74 The replanting after harvest of areas of plantation forest that does not meet the conditions of Rule 5.72 or the planting of new plantation forest that does not meet one or more of the conditions of Rule 5.73, within any flow-sensitive catchment listed in Sections 6 to 15 is a restricted discretionary activity. The exercise of discretion is restricted to the following matters: 1.The actual or potential adverse environmental effects of forestry planting on the surface water flows in the catchment, including water allocation status, minimum flow or flow regime, in-stream values and authorised takes	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	2	3	2	**12**
		Compromise to future environmental potential	1	1	1	1	1	**5**
		Landscape/ amenity effects	2	3	1	3	3	**12**
		Wilding pine spread	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	15	13	12	14	14	**68**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction, landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Canterbury Land and Water Regional Plan** **Earthworks and Vegetation Clearance in Riparian Areas** Notes: 1. In addition to the provisions of this Plan and any relevant district plan, any activity which may modify, damage or destroy pre 1900 archaeological sites is subject to the archaeological authority process under the Heritage New Zealand Poutere Taonga Act 2014. An archaeological authority is required from Heritage New Zealand to modify, damage or destroy any archaeological site, whether recorded or not in the New Zealand Heritage List/Rārangi Kōrero website. 5.168 The use of land for earthworks outside the bed of a river or lake or adjacent to a wetland boundary but within: (a) 10 m of the bed of a lake or river or a wetland boundary in Hill and High Country land or land shown as High Soil Erosion Risk on the Planning Maps; or (b) 5 m of the bed of a lake or river or a wetland boundary in all other land not shown as High Soil Erosion Risk on the Planning Maps or defined as Hill and High Country;	**Sediment discharge to waterways**	3	3	3	3	3	**15**

Canterbury Region			Canterbury Plan provisions					
Forestry activities	**Activity Status and Rules**	**Associated potential effects**	**Risk assessment**					
***Definitions from NES**	**Regional and District Plans Reviewed: Canterbury Land and Water Regional Plan Hurunui District Plan - A1 Environmental Amenity, A2 Landscape and A7 Natural Environment**		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensiveness**	**TOTAL SCORE (effect)**
	Vegetation Clearance and Earthworks in Erosion-prone Areas Note: Refer to the CRC's Erosion and Sediment Control Guidelines for additional guidance on undertaking vegetation clearance activities 5.170 Within the area shown as High Soil Erosion Risk on the Planning Maps and outside any riparian margin, the use of land (excluding any works for which a building consent has been obtained from the relevant local authority) for: [...] (f) Earthworks within a production forest undertaken in accordance with NZ Forest Road Engineering Manual (2012); or (g) Maintenance of existing firebreaks, roads and tracks and, during a fire emergency, construction of new firebreaks and tracks; or (g) Construction of fences; or (h) Construction of walking tracks no more than 1.5 m wide; or (i) Maintenance of existing transport networks; or (j) Earthworks and vegetation clearance associated with the establishment, repair or maintenance of pipelines, electricity lines, telecommunication lines and radio communication structures and fences; or (k) Other earthworks where: (i) the volume is less than 10 m3 per site or per hectare (whichever is the greater); and (ii) the maximum depth of cut or fill is 0.5 m; is a permitted activity, provided the following conditions are met: 1. Any cleared areas are stabilised and where it is not put to its final use shall be revegetated within 6 months from the date of the commencement of the vegetation clearance or earthworks; and 2. Any cultivation is across the contour of the land; and 3. When firebreaks, roads, or tracks are constructed or maintained the maximum depth of cut or fill is 0.5 m; and 4. the concentration of total suspended solids in the discharge shall not exceed: (a) 50 g/m3 , where the discharge is to any Spring-fed river, Banks Peninsula river, or to a lake except when the	**Erosion, soil loss or damage to soil structure**	3	2	2	2	3	**12**
		Damage to archaeological features	3	2	3	1	2	**11**

Canterbury Region			Canterbury Plan provisions					
Forestry activities	**Activity Status and Rules**	**Associated potential effects**	**Risk assessment**					
***Definitions from NES**	**Regional and District Plans Reviewed: Canterbury Land and Water Regional Plan Hurunui District Plan - A1 Environmental Amenity, A2 Landscape and A7 Natural Environment**		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensivenes**	**TOTAL SCORE (effect)**
	Hurunui District Plan A1.2.15 Earthworks All activities involving earthworks, shall comply with the following conditions: (a) Bulk earthworks: (i) No bulk earthworks in excess of 100 cubic metres or exceeding 500 square metres in area shall be undertaken above 900 metres. (ii) No bulk earthworks below 900 metres in altitude shall be undertaken in circumstances where this will lead to: Unacceptable scarring of the landscape in any visually prominent location or cause destruction of significant natural values with reference to the criteria in Appendix E2 or heritage values or cause adverse impacts on water bodies through siltation from runoff. (iii) For the purpose of sub-clause (ii) above "unacceptable scarring" means an impact arising from the physical alteration to the natural character of the land from the earthworks activity after taking into account the effect of any mitigation measures where such are proposed. (b) Earthworks (but excluding tracks providing foot access) shall not be carried out within 20 metres of any river, 50 metres of any wetland, or 100 metres of any lake with the following exemptions: (i) Earthworks associated with water and soil conservation activities or if carried out under the authority of Environment Canterbury or a resource consent. (ii) Earthworks carried out for reasons of public or personal safety. (iii) Maintenance of existing fence-lines, vehicle tracks, firebreaks, drains, ponds, dams or crossings. River for the purpose of this rule means any river or stream with a normal channel width flow of greater than 1.5 metres averaged over the reach of the river between a point of 40m upstream and a point of 40m downstream from that point of the river adjacent to where the proposed earthworks are to be located. (c) No earthworks shall require the clearing of more than 5000m2 of vegetation	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	2	3	2	**12**
		TOTAL SCORE (per criterion)	12	9	10	9	10	**50**
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Canterbury Land and Water Regional Plan** **Earthworks and Vegetation Clearance in Riparian Areas** Notes: 1. In addition to the provisions of this Plan and any relevant district plan, any activity which may modify, damage or destroy pre 1900 archaeological sites is subject to the archaeological authority process under the Heritage New Zealand Poutere Taonga Act 2014. An archaeological authority is required from Heritage New Zealand to modify, damage or destroy any archaeological site, whether recorded or not in the New Zealand Heritage List/Rārangi Kōrero website. 2. Refer to the CRC's Erosion and Sediment Control Guidelines for additional guidance on undertaking vegetation clearance activities **[See also Earthworks for sediment control provisions]**	**Damage to archaeological features**	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
	Vegetation Clearance and Earthworks in Erosion-prone Areas Note: Refer to the CRC's Erosion and Sediment Control Guidelines for additional guidance on undertaking vegetation clearance activities 5.170 Within the area shown as High Soil Erosion Risk on the Planning Maps and outside any riparian margin, the	**Erosion or damage to soil structure**	3	3	3	3	3	**15**
		Sediment discharge to waterways	3	3	3	3	3	**15**
	Hurunui District Plan A7.2 Conditions for permitted activities A7.2.1 General (e) Clearance of indigenous vegetation (iii) Provided that the clearance of indigenous vegetation located under forestry or existing forestry that occurs as a consequence of harvesting is permitted.	**Deposition of woody debris into waterways**	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	12	11	11	11	11	**56**

Canterbury Region			Canterbury Plan provisions					
Forestry activities	**Activity Status and Rules**	**Associated potential effects**	**Risk assessment**					
***Definitions from NES**	**Regional and District Plans Reviewed: Canterbury Land and Water Regional Plan Hurunui District Plan - A1 Environmental Amenity, A2 Landscape and A7 Natural Environment**		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensivenes**	**TOTAL SCORE (effect)**
MECHANICAL LAND PREPARATION Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and	**See Earthworks**	**Erosion or damage to soil structure**	3	2	2	2	3	**12**
		Damage to archaeological features	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Discharge of sediment and contaminants into waterways	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	12	9	10	9	11	**51**
PRUNING AND THINING TO WASTE Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations that thin in excess of this limit are likely to have similar effects	**See Harvesting**	**Deposition of woody debris into waterways**	**0**	**0**	**0**	**0**	**0**	**0**
		TOTAL SCORE (per criterion)	0	0	0	0	0	**0**
FORESTRY QUARRYING Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters. Scope includes the extraction of alluvial gravel outside river beds. Earthworks and mechanical land preparation do not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to	**Canterbury Land and Water Regional Plan** **Earthworks over Aquifers** Note: In addition to the provisions of this Plan and any relevant district plan, any activity which may modify, damage or destroy pre 1900 archaeological sites is subject to the archaeological authority process under the Heritage New Zealand Poutere Taonga Act 2014. An archaeological authority is required from Heritage New Zealand to modify, damage or destroy any archaeological site, whether recorded or not in the New Zealand Heritage List/Rārangi Kōrero website **5.175 The use of land to excavate material is a permitted activity, provided the following conditions are met:** 1. Over the Coastal Confined Gravel Aquifer System, as shown on the Planning Maps: (a) there is more than 1 m of undisturbed material between the deepest part of the excavation and Aquifer 1; and (b) if more than 100 m3 of material is excavated, the excavation does not occur within 50 m of any surface waterbody; or 2. Over an unconfined or semi-confined aquifer: (a) the volume of material excavated is less than 100 m3; or	**Sediment discharge to waterways**	3	2	3	2	3	**13**
	Canterbury Land and Water Regional Plan **5.176 The use of land to excavate material that does not comply with one or more of the conditions of Rule 5.175 is a restricted discretionary activity.** The exercise of discretion is restricted to the following matters (refer to plan):	**Erosion, soil loss or damage to soil structure**	1	0	0	0	1	**2**
		Damage to archaeological features	3	3	3	2	3	**14**

Canterbury Region			Canterbury Plan provisions					
Forestry activities	**Activity Status and Rules**	**Associated potential effects**	**Risk assessment**					
***Definitions from NES**	**Regional and District Plans Reviewed: Canterbury Land and Water Regional Plan Hurunui District Plan - A1 Environmental Amenity, A2 Landscape and A7 Natural Environment**		**Transparency**	**Effectiveness**	**Adaptability**	**Specificity**	**Comprehensiveness**	**TOTAL SCORE (effect)**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		TOTAL SCORE (per criterion)	10	7	8	7	9	**41**
REPLANTING Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.		**Increased environmental and property hazard**	1	2	2	3	2	**10**
		Damage to archaeological features	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Compromise to future environmental potential	1	1	1	1	1	**5**
		Wilding pine spread	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	11	10	11	11	11	**54**
RIVER CROSSINGS River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.	**5.137 The installation, alteration, extension, use, maintenance or removal of bridges and culverts, and the consequential deposition of substances on, in or under the bed of a lake or river, the excavation or other disturbance of the bed of a lake or river, and, in the case of culverts, the associated take, discharge or diversion of water is a permitted activity, provided the following conditions are met:** 1. Any material deposited in, on, under or over the bed of a lake or river in order to construct or maintain the structure is of inert materials of colour and material type that blends with the surrounding natural environment and does not contain or is not coated with any hazardous substance; and 2. The activity is undertaken at a distance greater than 10 m from any dam, weir, bridge, or network utility pole, pylon or flood protection vegetation, or 150 m from any water level recorder, or 50 m from any defence against water, or closer where there is evidence that permission has been obtained from the owner of the infrastructure or the works are being carried out by or on behalf of the owner; and 3. The works do not occur in flowing water; and 7. For any temporary culvert: (a) the maximum width of the river bed at the point of the crossing is 5 m; and (b) the culvert is installed at a level no higher than bed level, and no lower than 100mm below the level of the **5.141 Temporary discharges to water or to land in circumstances where a contaminant may enter water associated with undertaking activities in Rules 5.135 to 5.140 or in relation to artificial watercourses are permitted activities, provided the following conditions are**	**Sedimentation of the water column and bed of the river**	3	2	3	2	2	**12**
		Disruption of fish passage	3	3	3	1	3	**13**
		Damage to the river bed and downstream infrastructure.	2	2	2	3	2	**11**
		Impediment to water flows	3	2	3	2	3	**13**
		Loss of instream habitat (fords) and spawning habitat	3	2	3	2	2	**12**
		TOTAL SCORE (per criterion)	14	11	14	10	12	**61**

Gisborne Region

Forestry activities	Activity Status and Rules	Associated potential effects	Gisborne Plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Combined Regional Land and District Plan Discharges Plan		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Permitted activities** **Combined Regional Land and District Plan** 21.13 RURAL GENERAL (RURAL G) 21.13.1 Permitted Activities The following activities shall be permitted activities, in addition to Section 21.9.1, provided they comply with the General Rules: 21.13.1.2 Planting of vegetation Provided that: a) No vegetation shall be allowed to grow in a position which will shade any part of the carriageway of any sealed public road between the hours of 10am and 2pm on the shortest day of the year unless topography is already preventing direct access of sunlight onto that part of the carriageway b) No vegetation shall be planted closer than 20 metres to the centreline of the carriageway of any formed public road. c) No vegetation shall be planted closer than 10 metres to an adjoining property (excluding formed public roads). d) No vegetation shall be planted closer than 30 metres to an existing dwelling or curtilage on an adjoining property, unless the curtilage fence line closest to the property boundary exceeds a length of 50 metres. In such cases, the dwelling owner shall determine which 50 metre portion of the curtilage fence line shall be provided with a 30 metre setback. Rule 21.13.1.2(c) shall otherwise apply. In this context "existing dwelling" refers to one existing prior to the planting of vegetation. e) Any planting in the Airport Protection Overlay Area shall also be in accordance with the height planes. f) No vegetation shall be planted closer than 15 metres to any farm building in existence at the date of notification of the Plan, 8th November 1997. If conditions a), b), c), d), e) and f) are not complied with, planting of vegetation (excluding tree nurseries) closer to formed public roads and/or adjoining properties may be a permitted activity provided that: i) the written consent of the roading authority and/or adjoining property owner, clearly showing the location of the activity, is obtained and submitted to the Consent Authority, prior to the commencement of planting, or; ii) cumulative planting on land affected by any of the above will result in: (i) less than 10 trees, or; (ii) trees which will grow to less than 3 metres in height, or; (iii) trees which will be at a planting density less than 1 tree per 20 metres.	**Increased environmental and property hazard**	3	2	1	3	2	**11**
	4.7 OUTSTANDING LANDSCAPE AREA OVERLAY 3 4.7.3 Restricted Discretionary Activities 4.7.3.2 Tree planting, subject to Land Overlay 3A Rule 6.10.1 Provided that: 1. The tree planting exceeds 500m2 in any contiguous area and/or exceeds 500m2 over any 12 month period. 2. The tree planting activity is not a condition of a consent for subdivision, use or development.	**Damage to archaeological features**	3	2	3	3	2	**13**
		Degradation of significant terrestrial/ wetland biodiversity	0	0	0	0	0	**0**
		Compromise to future environmental potential	2	2	1	1	1	**7**
	4.8.4 Discretionary Activities 4.8.4.1 Tree planting (subject to Land Overlay 3A Rule 6.10.1), Vegetation clearance, tree planting, land disturbance, and structures within 200m of MHWS Provided that: 1. The activity is not for the purpose of erecting a dwelling unit on a site to be erected on a building platform for which a subdivision resource consent has been granted between 1 October 1991 and 8 November 1997 2. The site is outside any residential or port management zone. 3. The activity is vegetation clearance greater than 100m2 in any one contiguous area, or is tree planting that covers more than 100m2 in any one contiguous area (excluding landscaping associated with residential buildings)	**Landscape/ amenity effects**	3	3	2	3	3	**14**
		Wilding pine spread	0	0	0	0	0	**0**

		TOTAL SCORE (per criterion)	11	9	7	10	8	**45**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction, landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Combined Regional Land and District Plan** **6.6 REGIONAL RULES FOR LAND DISTURBANCE AND VEGETATION CLEARANCE** Note: **Activities shall comply, where relevant, with the regional or district rules in** Chapter 3- Cultural Heritage, Chapter 4-Natural Heritage, **Chapter 5-Natural Hazards, Chapter 7- Beds of Lakes and Rivers,** Chapter 8-Utilities, Chapter 9 – Contaminated Sites, Chapter 9A – Hazardous Substances and Chapter 10 – Signs. The rules of Chapter 6 shall apply in addition to the zone rules for the area. **General Regional Rules** Subject to any other rule in the Plan, land disturbance and vegetation clearance activities conducted in land overlays 1, 2 and 3 (including 3A), as denoted on the urban and rural planning maps, are permitted where they comply with the following regional rules. 6.6.1 No activity shall cause conspicuous change in colour or natural visual clarity of any off-site receiving water after reasonable mixing. 6.6.2 No vegetation, slash, spoil or other debris shall be directly deposited into a permanently flowing water body, lake, wetland or the sea, or be deposited into a position where it can readily enter, or be carried into a permanently flowing water body, lake, wetland, or the sea. No vegetation with a diameter greater than 100mm, spoil, or other debris shall be left in such a position. 6.6.3 All land disturbance activities shall include runoff controls around the area of disturbance where necessary to prevent concentration of runoff causing, erosion, scour and sediment discharge off-site. **6.7.1 Permitted Activities** 6.7.1.1 Land disturbance and vegetation clearance activities which are not specifically provided for in any other rule in this Chapter 6.7.1.4 Maintenance of lawfully established roads, tracks or earth dams 6.9 LAND OVERLAY 3 (Regional Rules) 6.9.1 Permitted Activities Subject to Rule 6.10.2, the following activities shall be permitted activities provided they comply with the General Regional Rules and any more restrictive rule in respect of Land Overlay 3A where applicable. Note: The following permitted activities are for the avoidance of doubt. The list is not exhaustive (Regional Rule	**Sediment discharge to waterways**	3	2	3	3	3	**14**
		Erosion or damage to soil structure	3	2	3	2	3	**13**
		Damage to archaeological features	3	2	3	3	2	**13**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	3	2	**13**
		TOTAL SCORE (per criterion)	12	8	12	11	10	**53**
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**REGIONAL RULES FOR LAND DISTURBANCE AND VEGETATION CLEARANCE** **6.6 General Regional Rules** Subject to any other rule in the Plan, land disturbance and vegetation clearance activities conducted in land overlays 1, 2 and 3 (including 3A), as denoted on the urban and rural planning maps, are permitted where they comply with the following regional rules. 6.6.1 No activity shall cause conspicuous change in colour or natural visual clarity of any off-site receiving water after reasonable mixing. 6.6.2 No vegetation, slash, spoil or other debris shall be directly deposited into a permanently flowing water body, lake, wetland or the sea, or be deposited into a position where it can readily enter, or be carried into a permanently flowing water body, lake, wetland, or the sea. No vegetation with a diameter greater than 100mm, spoil, or other debris shall be left in such a position. 6.6.3 All land disturbance activities shall include runoff controls around the area of disturbance where necessary to prevent concentration of runoff causing, erosion, scour and sediment discharge off-site. 6.6.4 Where an activity results in areas of exposed ground greater than a 0.5ha contiguous area over a 12 month period on any one site excluding firebreak sites, these areas shall be revegetated to give a ground cover of 75% of that area within 12 months of the activity ceasing. 6.6.5 Land disturbance batters and side-castings are to be stabilised by methods such as surface revegetation and drainage to avoid slumping and the generation of sediment. 6.6.6 Spoil and fill shall not be placed over vegetation other than grass, or placed in a position where it can cause erosion.	**Damage to archaeological features**	3	2	3	2	2	**12**

	6.7 LAND OVERLAY 1 (Regional Rules) NOTE : excludes the beds of lakes and rivers 6.7.1 Permitted Activities 6.7.1.6 Vegetation clearance Provided that: 1. The vegetation comprises trees or shrubs or other plants scattered amongst pasture; or 2. The clearance is by grazing; or 3. The clearance is harvesting of agricultural and horticultural crops; or 4. The clearance is required under a Regional Pest Management Strategy under the Biosecurity Act 1993; or 5. The clearance is land preparation such as discing, ploughing or ripping; or 6. The clearance is hand clearing for fencelines; or 7. The clearance is by line cutting; or 8. The clearance is plantation forest thinning resulting in at least 250 evenly distributed trees remaining per hectare; or	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	3	2	**13**
		Erosion or damage to soil structure	3	2	3	2	2	**12**
	7.7 Permitted Activities (Regional Rules) **7.7.10 The suspension and use of a temporary hauler cable and loads over the bed of lakes, and rivers in the normal course of plantation forest harvesting** Provided that: a) The material which is being hauled does not come in contact with the bed	**Sediment discharge to waterways**	3	2	3	3	2	**13**
		Deposition of woody debris into waterways	3	2	3	2	3	**13**
		Total score (per criterion)	15	10	15	12	11	63
MECHANICAL LAND PREPARATION *Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the earthworks rules.*	**Combined Regional Land and District Plan** **6.6 REGIONAL RULES FOR LAND DISTURBANCE AND VEGETATION CLEARANCE - See Earthworks; 6.7 LAND OVERLAY 1 (Regional Rules) - See Harvesting** **6.7 LAND OVERLAY 1 (Regional Rules)** NOTE : excludes the beds of lakes and rivers 6.7.1 Permitted Activities 6.7.1.6 Vegetation clearance Provided that: 5. The clearance is land preparation such as discing, ploughing or ripping; or 9. The clearance is of the indigenous under-storey to plantation forest, and is incidental to permitted or otherwise authorised plantation forest clearance.	**Erosion or damage to soil structure**	3	2	3	2	3	**13**
		Damage to archaeological features	3	2	3	2	2	
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	2	2	**12**
		Discharge of sediment and contaminants into waterways	3	2	3	3	3	**14**
		Total score (per criterion)	**12**	**8**	**12**	**9**	**10**	**39**

PRUNING AND THINING TO WASTE *Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning*	**Combined Regional Land and District Plan** **6.7 LAND OVERLAY 1 (Regional Rules) - 6.7.1 Permitted Activities** 6.7.1.6 Vegetation clearance Provided that: [...] 8. The clearance is plantation forest thinning resulting in at least 250 evenly distributed trees remaining per hectare; or 9. The clearance is of the indigenous under-storey to plantation forest, and is incidental to permitted or otherwise authorised plantation forest clearance.	**Deposition of woody debris into waterways**	3	3	3	3	3	**15**
		Total score (per criterion)	**3**	**3**	**3**	**3**	**3**	**15**
FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters. Scope includes the extraction of alluvial gravel*	**Combined Regional Land and District Plan** **6.6 REGIONAL RULES FOR LAND DISTURBANCE AND VEGETATION CLEARANCE - See Earthworks; 6.7 LAND OVERLAY 1 (Regional Rules) - See Harvesting** **6.7 - 6.9 LAND OVERLAY (Regional Rules) - as above for earthworks**	**Sediment discharge to waterways**	3	2	3	3	3	**14**
		Erosion or damage to soil structure	3	2	3	2	3	**13**
		Damage to archaeological features	3	2	3	3	2	
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	3	2	**13**
		Total score (per criterion)	**12**	**8**	**12**	**11**	**10**	**40**
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.*	**As for Afforestation**	**Increased environmental and property hazard**	3	1	2	1	1	**8**
		Damage to archaeological features	3	2	3	3	2	
		Degradation of significant terrestrial/ wetland biodiversity	0	0	0	0	0	**0**
		• Compromise to future environmental potential	0	0	0	0	0	**0**
		Wilding pine spread	0	0	0	0	0	**0**
		Total score (per criterion)	**6**	**3**	**5**	**4**	**3**	**8**

RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.*	**7.6 REGIONAL RULES FOR BEDS OF LAKES AND RIVERS** **7.7 Permitted Activities (Regional Rules)** **7.7.3 Erection, placement and ensuing use of any river crossing (including fords, culverts and other similar crossings, but excluding bridges) that is fixed in, on, or under the bed of any lake, river or wetland after the 20th of November 1997** Provided that: a) The structure does not occur on rivers within urban areas. b) The catchment of the river over which the crossing is located does not exceed 100ha. c) Any culvert shall convey at least a 5 year average recurrence interval (ARI) flood without heading up more than 0.5 metres or causing any significant increase in upstream water levels on neighbouring properties. d) Construction between 1 May and 1 October in any year (spawning season) shall ensure that: i. Fish passage is maintained following construction	**Sedimentation of the water column and bed of the river.**	3	2	3	2	2	**12**
	7.7.9 Structures, including bridges, cables, lines, pipelines and suspended fences, which are suspended over the bed of a lake, river or wetland which do not have any contact with the bed of the river Provided that: a) Structures are suspended at least 500mm above the 50 year ARI flood level at the lowest point of the structure.	**Disruption of fish passage/ disturbance to fish spawning habitat.**	3	3	3	2	3	**14**
	7.9 Restricted Discretionary Activities (Regional Rules) The following activities shall be restricted discretionary activities: **7.9.1 Erection, placement and ensuing use of any river crossing (including fords, culverts and other similar crossings, but excluding bridges) that is fixed in, on, or under the bed of any lake, river or wetland after the 20th of November 1997 which are unable to comply with specific conditions with respect to:** a) Timing of the event of the activity b) Size of the catchment in which culvert is placed Provided that:	**Damage to the river bed and downstream infrastructure.**	3	2	3	2	2	**12**
	7.10 Discretionary Activities (Regional Rules) The following activities shall be discretionary activities: **7.10.1 Activities listed as Permitted which do not comply with the rules and are not provided for as Controlled or Restricted Discretionary activities** **7.10.2 Use, erection, reconstruction, placement, alteration, removal or demolition of any structure or part of any structure which is not already provided for by a rule in the Plan** **7.10.3 Excavation, drilling, tunnelling or otherwise disturbance of the bed which is not already provided for by a rule in the Plan**	**Impediment to water flows**	3	2	3	2	3	**13**
		Loss of instream habitat (fords) and spawning	3	2	2	2	2	**11**
		Total score (per criterion)	**15**	**11**	**14**	**10**	**12**	**38**

Hawkes Bay Region

Forestry activities	Activity Status and Rules	Associated potential effects	Hawkes Bay Plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Hawkes Bay Regional Resource Management Plan Hastings District Plan Section 5.0 Rural Zone and Section 6.0 Plains Zone		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Hastings District Plan** Section 5.0 Rural Zone 5.7 Rules 5.7.1 PERMITTED ACTIVITIES The following activities shall be permitted, provided that they comply with the General Performance Standards and Terms in Section 5.8 and the relevant Specific Performance Standards and Terms in Section 5.9. ... • LAND BASED PRIMARY PRODUCTION [which includes "Forestry" which means "the establishment, management and harvesting of forestry plantations of more than 2 hectares in area, principally for commercial wood production but includes protection and conservation forestry."] 5.8 GENERAL PERFORMANCE STANDARDS AND TERMS 5.8.2 SHARING OF LAND, BUILDINGS AND ROADS **Hastings District Plan Rule 12.4.7** **The Waahi Tapu Resource Management Unit shall be complied with first, before any rules for the relevant underlying zone or District Wide Activity apply. Activities shall be assessed as a particular status under the rules of this RMU (e.g. permitted or discretionary) before they can be assessed and the relevant Rules and Standard(s) and Terms of the underlying Zoning or District Wide Activity apply.** **Hastings District Plan Rule 12.2.7 rules pertaining to plantation forestry in ONLs**	**Increased environmental and property hazard**	3	3	2	2	3	**13**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Compromise to future environmental potential	3	3	3	1	2	**12**
		Landscape/ amenity effects	3	3	2	3	3	**14**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	15	14	12	12	13	66
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction, landing construction, stream crossing approaches, and cut and fill operation, but does not*	**Hawkes Bay Regional Resource Management Plan** **Vegetation clearance or soil disturbance activities.** **Permitted activities** **Rule 7** a. All cleared vegetation, disturbed soil or debris shall be deposited or contained to reasonably prevent the transportation or deposition of disturbed matter into any water body. b. Vegetation clearance or soil disturbance shall not give rise to any significant change in the colour or clarity of any adjacent water body, after reasonable mixing. [...] d. Deposition of soil or soil particles across a property boundary shall not be objectionable or offensive. **Hastings District Plan** SECTION 13.4 EARTHWORKS DISTRICT WIDE ACTIVITY 13.4.8 GENERAL PERFORMANCE STANDARDS AND TERMS	**Sediment discharge to waterways**	3	2	3	2	3	**13**
		Erosion, soil loss or damage to soil structure	3	2	3	2	2	**12**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		TOTAL SCORE (per criterion)	12	9	11	10	10	52

Hawkes Bay Region

Forestry activities *Definitions from NES	Activity Status and Rules Regional and District Plans Reviewed: Hawkes Bay Regional Resource Management Plan Hastings District Plan Section 5.0 Rural Zone and Section 6.0 Plains Zone	Associated potential effects	Hawkes Bay Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Hawkes Bay Regional Resource Management Plan** **Vegetation clearance or soil disturbance activities.** **Permitted activities** **Rule 7** a. All cleared vegetation, disturbed soil or debris shall be deposited or contained to reasonably prevent the transportation or deposition of disturbed matter into any water body. b. Vegetation clearance or soil disturbance shall not give rise to any significant change in the colour or clarity of any adjacent water body, after reasonable mixing. c. No vegetation clearance shall occur within 5 metres of any permanently flowing river, or any other river with a bed width in excess of 2 metres, or any other lake or wetland, except that this condition shall not apply to: i. the clearance of plantation forestry established prior to the date of this Plan becoming operative, or ii. the areas identified in Schedule X to this Plan. d. Deposition of soil or soil particles across a property boundary shall not be objectionable or offensive, cause property damage or exceed 10 kg/m2. e. Where the clearance of vegetation or the disturbance of soil increases the risk of soil loss the land shall be: i. re-vegetated as soon as practicable after completion of the activity, but in any event no later than 18 months with species providing equivalent or better land stabilisation; or ii. retained in a manner which inhibits soil loss. Restricted Discretionary Activities: Vegetation clearance or soil Disturbance activities which do not meet the conditions in Rule 7.	**Damage to archaeological features**	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	1	2	**11**
	Hastings District Plan SECTION 13.4 EARTHWORKS DISTRICT WIDE ACTIVITY 13.4.8 GENERAL PERFORMANCE STANDARDS AND TERMS 13.4.8.2 VEGETATION	**Erosion or damage to soil structure**	3	2	3	2	2	**12**
		Sediment discharge to waterways	3	3	3	3	2	**14**
		Deposition of woody debris into waterways	3	2	3	2	3	**13**
		Total score (per criterion)	**15**	**12**	**15**	**11**	**12**	**65**
MECHANICAL LAND PREPARATION *Mechanical land preparation includes root raking, discing*	**Hawkes Bay Regional Resource Management Plan** No specific rules observed [refer to earthworks]	**Erosion or damage to soil structure**	3	2	3	2	2	**12**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Discharge of sediment and contaminants into waterways	3	2	3	2	3	**13**
		Total score (per criterion)	**12**	**9**	**11**	**10**	**10**	**52**
PRUNING AND THINING TO WASTE *Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations*	**As for harvesting**	**Deposition of woody debris into waterways**	3	2	3	2	3	13
		Total score (per criterion)	**3**	**2**	**3**	**2**	**3**	**13**

Hawkes Bay Region

Forestry activities *Definitions from NES	Activity Status and Rules Regional and District Plans Reviewed: Hawkes Bay Regional Resource Management Plan Hastings District Plan Section 5.0 Rural Zone and Section 6.0 Plains Zone	Associated potential effects	Hawkes Bay Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters. Scope includes the extraction*	**Hawkes Bay Regional Resource Management Plan** No specific rules observed **[refer to earthworks rules]**	Sediment discharge to waterways	3	2	3	2	3	**13**
		Erosion, soil loss or damage to soil structure	3	2	3	2	2	**12**
		Damage to archaeological features	3	3	3	3	3	**3**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Total score (per criterion)	**6**	**4**	**6**	**4**	**5**	**25**
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years. .*	**No specific rules observed**	**Increased environmental and property hazard**	0	0	0	0	0	**0**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	2	3	2	**12**
		Compromise to future environmental potential	0	0	0	0	0	**0**
		Wilding pine spread	0	0	0	0	0	**0**
		Total score (per criterion)	**0**	**0**	**0**	**0**	**0**	**0**
RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.*	**Hawkes Bay Regional Resource Management Plan** **Structures and disturbance in, on, under, or over the bed of a river or lake activities**. **Permitted activities** **Rule 72** Permitted – subject to the following conditions: a. The scale of the structure shall comply with the following: i. Access structures in or on the bed of a river or lake, including bridges, culverts, and fords, shall be located in a catchment that is no greater than 150 ha. ii. Other structures in or on the bed of a river or lake shall occupy an area of bed no greater than 10 m2. b. The structure shall not change the natural course of any river or lake. c. Any release of sediment shall not cause any conspicuous change in the colour or visual clarity of water after reasonable mixing. d. There shall be no discharge of contaminants, other than sediment, into the river or lake. e. All materials used shall not be toxic to aquatic ecosystems. f. The activity shall be undertaken in a manner that continues to provide for the existing passage of fish past the structure. g. The structure shall not cause any increase in the risk of flooding or damage to any property during flood events, including the risk resulting from trapped debris. h. Any diversion of water for the purposes of carrying out the activity shall be for a period of no more than five consecutive days. i. The activity or structure shall not cause any erosion, scour or deposition beyond the area of the activity or structure or adversely affect any other lawfully established structure. j. All excess materials shall be removed from the bed by completion of the activity. k. In areas of fish spawning there shall be no disturbance of any part of the bed covered by water from 1 May to 30 September (fish spawning season) access structures to these, or where emergency works are required. l. Any whitebait structure shall be removed within 14 days of the end of any whitebait season.	**Sedimentation of the water column and bed of the river**	3	2	3	2	3	**13**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
AFFORESTATION Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.	**Horizons One Plan** **13-3 Forestry - Permitted** Conditions/standards/terms (a) The activity must not take place on land^ that is within a coastal foredune*. (b) Any earthworks, the formation of any new track* **and any planting or replanting of forestry* trees** must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing (ii) the bed^ of a lake^ (iii) a rare habitat*, threatened habitat* or at-risk habitat*. (c) **Any new planting of forestry* trees** and associated formation of any new track* or earthworks must not occur on land* that is in, or within 10 m of wetland^ habitat types (including lakes^) as defined in Schedule F.	**Increased environmental and property hazard**	2	2	1	3	1	**9**
	Advice note: The rules^ in this regional plan^ do not authorise the modification or disturbance of any archaeological or registered waahi tapu* sites within the area of activity. Written authority from the Heritage New Zealand is required prior to any destruction, damage or modification of an archaeological or registered waahi tapu* site or an area where there is reasonable cause to suspect there is an archaeological site. Should any artefacts, bones or any other sites of archaeological or cultural significance be discovered within the area affected by the activity, written authorisation should be obtained from the Heritage New Zealand before any damage, modification or destruction is undertaken.	**Damage to archaeological features**	3	3	3	3	3	**15**
	Whanganui District Plan Chapter 3 - Rural Environments 3.8 RULES – RURAL GENERAL ZONE 3.8.1 Permitted Activities All activities shall comply with Performance Standards within this chapter, any relevant overlay or other chapters of the Plan: The following are permitted activities in the Rural General Zone: a. Rural activities. [where Rural activities means the use of land, buildings and other structures for the purposes of breeding animals or growing vegetative matter, and includes forestry...] 3.9 PERFORMANCE STANDARDS – Rural General 3.9.7 Trees b. Trees shall be planted to ensure that at maturity, the base of the tree shall fit within a recession plane which commences 2 metres above existing ground level at least 2 metres from any boundary and then projects from this line inwards at a 45 degree angle. Except that this standard does not require any tree to be planted more than 10 metres from a boundary	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	2	2	**12**
		Compromise to future environmental potential	1	1	2	1	1	**6**
		Landscape/ amenity effects	2	2	1	3	2	**10**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	11	10	10	12	9	**52**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction,* *landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Horizons One Plan** **13-3 Forestry - Permitted (See also 14-18 wrt Discharges under Quarrying rules)** Except as regulated by Rule 13-8 and 13-9, any forestry* pursuant to s9(2) RMA, and any ancillary: (a) disturbance of the bed^ of a river^ or lake^ pursuant to s13(1) RMA by forestry*, or (b) diversion of water^ pursuant to s14(2) RMA on the land^ (but not within a river^) where the forestry * is undertaken, or (c) **discharge^ of sediment** or slash* **into water**^ or onto or into land^ that may enter water^ pursuant to s15(1) or 15(2A) RMA resulting from the forestry*. Conditions/standards/terms (a) The activity must not take place on land^ that is within a coastal foredune*. (b) **Any earthworks**, the formation of any new track* and any planting or replanting of forestry* trees must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing (ii) the bed^ of a lake^ (iii) a rare habitat*, threatened habitat* or at-risk habitat*. **unless the new track* or earthworks in** (b)(i) or (b)(ii) is: (A) necessary to connect to and from a formed river* crossing point that is a consented or permitted activity, and/or (B) for the purpose of the maintenance* or upgrade* of an existing track* or earthwork. **(c) Any new planting of forestry* trees and associated formation of any new track* or earthworks must not occur on land* that is in, or within 10 m of wetland^ habitat types (including lakes^) as defined in Schedule F.** (d) Any earthworks or the formation of any new track* must not occur on land^ that is in, or within 10 m of a reach of a river^ or its bed^ with a Schedule B Value of Trout Spawning or Trout Fishery, unless the new track* or earthworks is: (A) necessary to connect to and from a formed river* crossing point that is a consented or permitted activity, and/or (B) for the purpose of the maintenance* or upgrade* of an existing track* or earthwork. [...] (g) Water^ run-off controls must be installed and maintained for tracks* and landing sites*. (h) Batters, cuts and side castings must be established by methods that prevent slumping.	**Sediment discharge to waterways**	3	2	3	3	3	**14**
	13-6 Specified vegetation clearance*, land disturbance* or cultivation* in a Hill Country Erosion Management Area* - Restricted Discretionary Pursuant to s9(2) RMA, except as regulated by Rule 13-8 and 13-9, any: (a) land disturbance* of more than 100 m2 per property* per 12-month period, [...] and any ancillary: (a) diversion of water^ pursuant to s14(2) RMA on the land^ where the vegetation clearance*, land disturbance* or cultivation* is undertaken, or (b) discharge^ of sediment into water^ pursuant to s15(1) RMA resulting from the vegetation clearance*, land disturbance* or cultivation*. Conditions/Standards/Terms (a) The activity must not take place on land^ that is within a coastal foredune*. (b) The activity must not occur on land^ that is in, or within 10 m of: (i) the bed^ of a river^ that is permanently flowing, (ii) the bed^ of a river^ that is not permanently flowing and has an active bed* width greater than 1 m, (iii) the bed^ of a lake^, (iv) a wetland^ as identified in Schedule F, (v) sites valued for Trout Spawning as identified in Schedule B, (vi) Sites of Significance - Aquatic as identified in Schedule B. 13-7 Vegetation clearance*, land disturbance*, cultivation* or forestry* that does not comply with Rules 13-1 to 13-6 - Discretionary Except as regulated by Rule 13-8 and 13-9, any vegetation clearance*, land disturbance*, cultivation* or forestry* pursuant to s9(2) RMA that does not meet the conditions^, standards or terms of Rules 13-1, 13-2, 13-3, 13-4, 13-5 or 13-6 and any ancillary: (a) disturbance of the bed^ of a river^ or lake^ by forestry* authorised by those rules^ pursuant to s13(1) RMA (b) diversion of water^ authorised by those rules^ pursuant to s14(2) RMA, or (c) discharge^ of sediment or slash* authorised by those rules^ pursuant to s15(1) RMA.	**Erosion, soil loss or damage to soil structure**	3	2	3	2	3	**13**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
		Damage to archaeological features	3	3	3	3	3	**15**
	13-8 Some activities within at-risk habitats* - **Discretionary** [...] any of the following activities within an at-risk habitat*: (b) forestry* pursuant to s9(2) RMA that does not meet condition^, standard or term of Rule 13-3(b)(iii)... 13-9 Some activities within rare habitats* and threatened habitats **- Non complying** [...] any of the following activities within a rare habitat*, threatened habitat*: (a) **vegetation clearance*, land disturbance*** or cultivation* pursuant to s9(2) RMA (b) forestry* pursuant to s9(2) RMA that does not meet condition^, standard or term of Rule 13-3 (b)(iii) or (e) (c) the drilling, construction or alteration of any bore* pursuant to s9(2) RMA (d) activities restricted by s13(1) or s13(2) RMA in the beds^ of rivers^ or lakes^ Whanganui District Plan 14.9 PERFORMANCE STANDARDS FOR EARTHWORKS 14.9.2 General earthworks standards. The following standards apply to earthworks in all zones except that provision 1(a) to 1(e) shall not apply to the Rural Production, Rural General, Rural Lifestyle, Rural Settlement and Airport Enterprise zones: f. Earthworks shall not: i. result in visible evidence of settled dust beyond the boundaries of the subject site to which the works relate. ii. alter overland flow paths, including swales and low impact stormwater devices, in a manner that causes damage to property through inundation, erosion, or subsidence. iii. cause excessive vibration on surrounding sites. iv. create, encourage, or exacerbate erosion or instability. v. discharge any materials such as soils, sediment or vegetation into reticulated infrastructure or onto roads as a result of earthworks. Noncompliance with this Standard shall be deemed a Non-Complying Activity. vi. Construction noise from a site in any zone shall not exceed the limits recommended in, and shall be measured and assessed in accordance with, NZS 6803:1999 Acoustics Construction Noise. Note: The requirements of the Land Drainage Act 1908 still apply and should be referred to by	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	2	2	**12**
		TOTAL SCORE (per criterion)	12	9	12	10	11	**54**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Horizons One Plan** **13-3 Forestry - Permitted** Except as regulated by Rule 13-8 and 13-9, any forestry* pursuant to s9(2) RMA, and any ancillary: **(a) disturbance of the bed^ of a river^ or lake^ pursuant to s13(1) RMA by forestry*,** or (b) diversion of water^ pursuant to s14(2) RMA on the land^ (but not within a river^) where the forestry * is undertaken, or **(c) discharge^ of sediment or slash* into water^ or onto or into land^ that may enter water^ pursuant to s15(1) or 15(2A) RMA resulting from the forestry*.** Conditions/standards/terms **(a) The activity must not take place on land^ that is within a coastal foredune*.** (b) Any earthworks, the formation of any new track* and any planting or replanting of forestry* trees must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing (ii) the bed^ of a lake^ (iii) a rare habitat*, threatened habitat* or at-risk habitat*. unless the new track* or earthworks in (b)(i) or (b)(ii) is: (A) necessary to connect to and from a formed river* crossing point that is a consented or permitted activity, and/or (B) for the purpose of the maintenance* or upgrade* of an existing track* or earthwork. (c) Any new planting of forestry* trees and associated formation of any new track* or earthworks must not occur on land* that is in, or within 10 m of wetland^ habitat types (including lakes^) as defined in Schedule F. (d) Any earthworks or the formation of any new track* must not occur on land^ that is in, or within 10 m of a reach of a river^ or its bed^ with a Schedule B Value of Trout Spawning or Trout Fishery, unless the new track* or earthworks is: (A) necessary to connect to and from a formed river* crossing point that is a consented or permitted activity, and/or (B) for the purpose of the maintenance* or upgrade* of an existing track* or earthwork. (e) If any rare habitat*, threatened habitat* or at-risk habitat* is present within 5 m of an area of forestry* prior to undertaking harvesting an Operational Plan*, detailingmeasures taken to avoid or mitigate adverse effects^ on these areas, must be prepared and submitted to the Regional	**Damage to archaeological features**	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	2	3	**13**
	13-5 Vegetation Clearance - Permitted Except as regulated by Rules 13-6, 13-8 and 13-9, any vegetation clearance* pursuant to s9(2) RMA and any ancillary: (a) diversion of water^ pursuant to s14(2) RMA on the land^ where the vegetation clearance* is undertaken, (b) discharge^ of sediment into water^ pursuant to s15(1) RMA resulting from the vegetation clearance. Conditions/Standards/Terms (a) The activity must not take place on land^ that is within a coastal foredune*. (b) Any ancillary discharge^ of sediment into water^ must not, after reasonable mixing, cause the receiving water body^ to breach the water quality standards for visual clarity set out in Schedule E for that water body^. (c) The activity must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing (ii) the bed^ of a river^ that is not permanently flowing and has an active bed* width greater than 1 m (iii) the bed^ of a lake^. (d) The activity must not occur on land^ that is in, or within 10 m of: (i) A wetland^ as identified in Schedule F (ii) Sites valued for Trout Spawning as identified in Schedule B	**Erosion or damage to soil structure**	3	2	3	2	2	**12**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
	13-6 Specified vegetation clearance*, land disturbance* or cultivation* in a Hill Country Erosion Management Area* - Restricted Discretionary Pursuant to s9(2) RMA, except as regulated by Rule 13-8 and 13-9, any: (a) land disturbance* of more than 100 m2 per property* per 12-month period, or (b) vegetation clearance* of 1 ha or greater per property* per 12-month period where the age of the vegetation in the area to be cleared is greater than seven years, or (c) cultivation*, undertaken within a Hill Country Erosion Management Area* and any ancillary: (a) diversion of water^ pursuant to s14(2) RMA on the land^ where the vegetation clearance*, land disturbance* or cultivation* is undertaken, or (b) discharge^ of sediment into water^ pursuant to s15(1) RMA resulting from the vegetation clearance*, land disturbance* or cultivation*. **Conditions/Standards/Terms** (a) The activity must not take place on land^ that is within a coastal foredune*. (b) The activity must not occur on land^ that is in, or within 10 m of: (i) the bed^ of a river^ that is permanently flowing, (ii) the bed^ of a river^ that is not permanently flowing and has an active bed* width greater than 1 m, (iii) the bed^ of a lake^, (iv) a wetland^ as identified in Schedule F, (v) sites valued for Trout Spawning as identified in Schedule B, (vi) Sites of Significance - Aquatic as identified in Schedule B. **13-7 Vegetation clearance***, land disturbance*, cultivation* or forestry* that does not comply with Rules 13-1 to 13-6 - Discretionary Except as regulated by Rule 13-8 and 13-9, any vegetation clearance*, land disturbance*, cultivation* or forestry* pursuant to s9(2) RMA that does not meet the conditions^, standards or terms of Rules 13-1, 13-2, 13-3, 13-4, 13-5 or 13-6 and any ancillary: (a) disturbance of the bed^ of a river^ or lake^ by forestry* authorised by those rules^ pursuant to s13(1) RMA (b) diversion of water^ authorised by those rules^ pursuant to s14(2) RMA, or (c) discharge^ of sediment or slash* authorised by those rules^ pursuant to s15(1) RMA.	**Sediment discharge to waterways**	3	3	3	3	3	**15**
	Whanganui District Plan 10.5 PERFORMANCE STANDARDS - INDIGENOUS FOREST & RIPARIAN MARGINS 10.5.1 No activity shall result in the removal, in any one calendar year, of more than 0.5 hectares of indigenous forest. For the purpose of this rule "indigenous forest" is defined as indigenous vegetation where: a. an average canopy height of 6 metres or taller; or b. a continuous canopy of trees with the potential to reach 30cm trunk diameter; but excluding: i. kanuka and manuka when not accompanied by other indigenous tree species, and ii. indigenous species used for production of forestry, and iii. indigenous vegetation which has grown beneath production forestry. This rule applies to the clearance of more than 0.5 hectares of indigenous forest in one contiguous area and to the clearance of smaller areas where the total area of indigenous forest cleared in the locality is more than 0.5 hectares. (This rule does not apply to the removal of indigenous forest for the maintenance of safety of network utilities).	**Deposition of woody debris into waterways**	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	15	13	15	12	14	**69**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
MECHANICAL LAND PREPARATION Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the earthworks rules. Earthworks and quarrying do not fall within the scope of mechanical land preparation. Earthworks and quarrying are defined activities and are subject to specific controls.	See Earthworks	**Erosion or damage to soil structure**	3	2	3	2	2	**12**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	2	2	**12**
		Discharge of sediment and contaminants into waterways	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	12	10	12	9	10	**53**
PRUNING AND THINING TO WASTE Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations that thin in excess of this limit are likely to have similar effects to harvesting operations and fall within the definition of harvesting. Thinning-to-waste operations leave the felled trees in situ. Note: Production thinning involves the removal of thinned trees for sale and falls within the definition of harvesting.	See Harvesting	**Deposition of woody debris into waterways**	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	3	3	3	2	3	**14**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
FORESTRY QUARRYING Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters. Scope includes the extraction of alluvial gravel outside river beds. Earthworks and mechanical land preparation do not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to specific controls.	**Horizons One Plan** **14-18 Discharges^ of stormwater to surface water^ and land^ - Permitted** The discharge^ of stormwater into surface water^ pursuant to s15(1) RMA or onto or into land^ pursuant to ss15(1) or 15(2A) RMA, and any ancillary takes or diversions of stormwater pursuant to s14(2) RMA forming part of the stormwater system. (a) The discharge^ must not include stormwater from any: (iii) operating quarry or mineral^ extraction site* unless there is an interceptor system* in place. (b) The discharge^ must not cause or exacerbate the flooding of any other property*. (c) The activity must not cause erosion of any land^ or the bed^ of any water body^ beyond the point of discharge^ unless this is not practicably avoidable, in which case any erosion that occurs as a result of the discharge^ must be remedied as soon as practicable. (d) There must be no discharge^ to any rare habitat*, threatened habitat*, at-risk habitat*, or reach of river^ or its bed^ with a Schedule B Value of Natural State. (e) For discharges^ of stormwater onto or into land^: (i) the discharge^ must be below a rate that would cause flooding outside the design discharge^ soakage area, except in rain events equivalent to or greater than the 10% annual exceedance probability design storm. Any exceedance must go into designated overland flow paths (ii) there must not be any overland flow resulting in a discharge^ to a natural surface water body^, except in rain events equivalent to or greater than the 10% annual exceedance probability design storm (iii) the discharge^ must not contain concentrations of hazardous substances* that are toxic to aquatic ecosystems, or accumulate in soil. (f) For discharges^ of stormwater into surface water bodies^ the discharge^ must not cause any permanent reduction of the ability of the receiving water body^ or its bed^ to convey flood flows. (g) For discharges^ of stormwater into surface water bodies^ the discharge^ must not cause, after reasonable mixing*, any of the following effects^ in the receiving water body^: (i) the production of conspicuous oil* or grease films, scums or foams, or floatable or suspended materials (ii) any conspicuous change in the colour or visual clarity of the receiving water^ (iii) any emission of objectionable odour	**Sediment discharge to waterways**	3	3	3	2	3	**14**
	Horizons One Plan 14-19 Discharges^ of stormwater to surface water^ or land not complying with Rule 14-18 The discharge^ of stormwater into surface water^ pursuant to s15(1) RMA or onto or into land^ pursuant to ss15(1) or 15(2A) RMA, which does not comply with Rule 14-18, and any ancillary takes or diversions of stormwater pursuant to s14(2) RMA forming part of the stormwater system. (a) There must be no discharge^ to any rare habitat*, threatened habitat*, at-risk habitat*, or reach of a river^ or its bed^ with a Schedule B Value of Natural State.	**Erosion, soil loss or damage to soil structure**	3	2	3	2	2	**12**
		Damage to archaeological features	3	3	3	3	3	**15**
	Whanganui District Plan Chapter 3 - Rural Environments 3.4.3 Discretionary Activities. The following activities are discretionary activities in the Rural Production Zone: d. Quarrying. 3.8.3 Discretionary Activities. The following activities are discretionary activities in the Rural General Zone: d. Quarrying.	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	2	2	**12**
		TOTAL SCORE (per criterion)	12	10	12	9	10	**53**
REPLANTING Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.	**See Afforestation**	**Increased environmental and property hazard**	2	2	1	3	1	**9**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	2	3	**13**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
		Compromise to future environmental potential	1	1	2	1	1	**6**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	9	8	9	9	8	**43**
RIVER CROSSINGS River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.	**Horizons One Plan** General conditions^ for permitted activities^ and controlled activities^ involving the beds^ of rivers^ and lakes (a) The activity must not adversely reduce the ability of the water body^ or its bed^ to convey flood flows, floating debris or sediment, except for a period of not more than 12 consecutive hours during construction. (b) There must be no discharge^ of contaminants^, other than sediment and other contaminants^ inherent to the water^ or bed^, into the river^ or lake^ except where the discharge^ is explicitly allowed by the activity description of a rule^ in this chapter. (c) Any discharge^ of sediment into water^ directly caused by the activity, that causes the visual clarity standards in Schedule E to be breached, must not be undertaken for more than 24 hours in total across 5 consecutive days. There must be no more than one activity per river^ per property* in any 12 month period. (d) Any discharge^ of sediment into water^ under (c) must not, after reasonable mixing*, cause any conspicuous change in the colour of water^ in the receiving water^ or any change in horizontal visibility greater than the target set in the visual clarity % change column of Schedule E, more than 12 hours after completion of the activity. (e) Any materials used must be necessary for the activity and must not be toxic to aquatic ecosystems. (f) Any materials no longer required as part of the activity, including any temporary structures^, must not be stored in or on the bed^ of any river^ or lake^ and must be removed after completion of the activity. (g) Refuelling of machinery must not take place in any area where spills may enter surface water^. (h) The activity must be undertaken in a manner that provides for the safe passage of fish both upstream and downstream, including past any structure^. (i) Any diversion of water^ required for works ancillary to a structure^ must be temporary, must be within the bed^ of the river^, must not exceed 100 m in length, must not be between catchments, must not involve a lake^, and the diversion channel must have sufficient capacity to carry the same flow as the original channel. (j) Upon completion of any channel bank works, the banks must be reinstated to a natural contour and revegetated.	**Sedimentation of the water column and bed of the river**	3	3	3	3	3	**15**

Horizons Region

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Horizons One Plan Whanganui District Plan - Chapter 3 - Rural Environments		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
	Horizons One Plan **17-11 Other structures^ including bridges, fords and other access structures^ - Permitted** The erection, placement, or extension of any structure^ that is not regulated by any other rule^ in this chapter in, on, under or over the bed^ of a river^ or lake^ pursuant to s13(1) RMA and any ancillary: (a) excavation, drilling, tunnelling or other disturbance of the river^ or lake^ bed pursuant to s13(1) RMA (b) damming or diversion of water^ pursuant to s14(2) RMA (c) discharge^ of water^ or sediment into water^ or onto or into land^ pursuant to ss15(1) or 15(2A) RMA (d) deposition of substances in or on the bed^ of the river^ or lake^ pursuant to s13(1). Conditions/Standards/Terms (a) A new structure^ must not be erected or placed in: (i) a river^ or lake^ regulated under Rule 17-3 (ii) a reach of a river^ with a Schedule B Value of Flood Control and Drainage, unless the work is undertaken by or on behalf of the Regional Council. (b) For bridges and other access structures^, except fords and temporary bridges for military training purposes that are removed within 2 weeks of their erection, located in, on, under or over the bed^ of a river^ or lake^, the catchment area above the structure^ must be no greater than 200 ha. (c) For all structures^ located in, on, under or over the bed^ of a river^ or lake^, the structure^ must occupy a bed^ area no greater than 20 m2 except for: (i) whitebait* and maimai structures^ which must not exceed 5 m2 (ii) fords which must occupy a bed^ area no greater than 40 m2 (iii) temporary bridges for military training purposes that are removed within 2 weeks of their erection. (d) The structure^ must be constructed and maintained to avoid any aggradation or scouring of the bed^ that may inhibit fish passage. (e) The activity must comply with the general conditions^ listed in Section 17.3. (f) The activity must not take place in any rare habitat*, threatened habitat* or at-risk habitat*	**Disruption of fish passage**	3	3	3	3	3	**15**
	Horizons One Plan **17-13 Bridges and culverts constructed to comply with Rules 14-1 to 14-4 - Controlled** The erection, placement or extension of a culvert or bridge in, on, under or over the bed^ of a river^ or lake^ pursuant to s13 RMA in order to comply with Rules 14-1 to 14-4 and any ancillary: (a) excavation, drilling, tunnelling or other disturbance of the river^ or lake^ bed^ pursuant to s13(1) RMA (b) damming or diversion of water^ pursuant to s14(2) RMA (c) discharge^ of water^ or sediment into water^ or onto or into land^ pursuant to ss15(1) or 15(2A) RMA (d) deposition of substances in or on the bed^ of the river^ or lake^ pursuant to s13(1). Conditions/Standards/Terms (a) The proposed activity is required in order to comply with Rules 14-1 to 14-4 but is unable to meet one or more of the conditions^ of Rules 17-5, 17-10 or 17-11. (b) The activity must not take place in any rare habitat*, threatened habitat* or at-risk habitat*.	**Damage to the river bed and downstream infrastructure.**	3	2	3	3	3	**14**
		Impediment to water flows	3	3	3	2	3	**14**
		Loss of instream habitat (fords) and spawning habitat	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	15	13	15	13	15	**71**

Northland Region

Forestry activities	Activity Status and Rules	Associated potential effects	Northland Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
*Definitions from NES	**Regional and District Plans Reviewed: Northland Water and Soil Plan Regional Plan** **Far North District Plan - Operative: Chapter 8 - Rural Environment and Chapter 12 - Natural and Physical Resources**							
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Far North District Plan - Operative** Chapter 12 - Natural and Physical Resources Rule 12.1.6.1.3 Tree Planting in Outstanding landscapes Single species tree planting is permitted in an Outstanding Landscape, as shown on the Resource Maps: (a) if the species is indigenous; or (b) it is replanting an area of established plantation forest; or (c) the planting does not exceed 4ha in area on any one site in a rural environment zone, or 2ha in area on any one site in a coastal environment zone. Note: Council can provide information on how best to reduce potential visual impacts of single species planting. 12.4.6.1.2 Fire Risk to Residental Units (a) Residential units shall be located at least 20m away from the drip line of any trees in a naturally occurring or deliberately planted area of scrub or shrubland, woodlot or forest; (b) Any trees in a deliberately planted woodlot or forest shall be planted at least 20m away from any urban environment zone, Russell Township or Coastal Residential Zone boundary, excluding the replanting of plantation forests existing at July 2003.	**Increased environmental and property hazard**	3	2	1	3	1	**10**
		Damage to archaeological features	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	**14**
		Compromise to future environmental potential	0	0	0	0	0	**0**
		Landscape/ amenity effects	3	2	2	2	2	**11**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	**12**	**10**	**9**	**9**	**9**	**49**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction,* *landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Northland Water and Soil Plan Regional Plan** 22. RULES FOR STORMWATER DISCHARGES AND DIVERSIONS FROM ROADS AND FROM LAND DISTURBANCE ACTIVITIES 22.1 PERMITTED ACTIVITIES The following diversions and discharges associated with stormwater from roads and land disturbance activities are permitted activities: 1. The diversion and discharge of stormwater into water or onto or into land where it may enter water from any land disturbance activity, which is permitted under a land disturbance activity rule in this Plan is a permitted activity, provided that: (a) The stormwater is diverted or discharged in the catchment from which it originates. (b) Water and sediment control measures (e.g. rock riprap, cut-off drains, sediment traps) are installed and maintained, to avoid or minimise erosion and to avoid or minimise sediment discharges to any adjacent water bodies or to any coastal waters. **(c) The diversion and discharge has a no more than minor adverse effect (as determined by the relevant water quality guidelines in Section 7) on aquatic ecosystems and/or on neighbouring or downstream landowners/occupiers (e.g. deposition of sediment, exacerbation of flooding).** Explanation: The land disturbance rules have environmental standards, which also relate to the discharge of stormwater from the activity. The discharge of stormwater would require a consent unless permitted by a rule. This rule allows the discharge provided conditions 1(a) and 1(b), and the land disturbance rule are complied with. Clause (a) relates to Maori culture objections to the diversion of water from one catchment to another. 2. The diversion and discharge of stormwater from any road or track by way of an open constructed stormwater collection system or piped stormwater collection system into water or onto or into land where it may enter water provided the stormwater collection system is connected to, or part of, a stormwater system for which a resource consent exists is a permitted activity. 3. The diversion and discharge of stormwater, not otherwise permitted by Rule 22.01.02 from any road or track into water or onto or into land where it may enter water is a permitted activity, provided that: (a) The road does not form part of a stormwater collection sy tem that is designed to divert or discharge stormwater from any of the sources otherwise regulated by rules contained in Section 21 of this Plan.	**Sediment discharge to waterways**	3	3	3	3	3	**15**

Northland Region

Forestry activities	Activity Status and Rules	Associated potential effects	Northland Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
*Definitions from NES	**Regional and District Plans Reviewed: Northland Water and Soil Plan Regional Plan** **Far North District Plan - Operative: Chapter 8 - Rural Environment and Chapter 12 - Natural and Physical Resources**							
	(b) Water and sediment control measures (e.g. rock rip rap, cut-off drains, sediment traps) are installed and maintained to avoid or minimise erosion and to avoid or minimise sediment discharges to any adjacent water bodies or to any coastal water. Section 22 – Rules for Stormwater Discharges and Diversions from Roads and from Land Disturbance Activities **22-2 Regional Water and Soil Plan for Northland** (c) The diversion and discharge does not cause adverse effects on neighbouring properties. (d) The stormwater collection system is designed to cater for stormwater flows resulting from not less than a 1 in 5 year return period storm event, and a stabilised overland flow path including the use of a road is provided for to allow flows up to and including the 1 in 50 year storm event in excess of the capacity of the primary collection system. (e) Environmental Standards 32.02.02 and 32.02.03 are complied with. (f) For discharges to a water body, the discharge does not: (i) Increase the natural temperature of the receiving water by more than 3° Celsius at or beyond a 20 metre radius from the discharge point. (ii) Cause the pH of the receiving water to fall outside of the range of 6.5 to 9 at or beyond a 20 metre radius of the discharge point. (iii) Cause the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials in the receiving water at or beyond a 20 metre radius of the discharge point. (iv) Cause the emission of objectionable odour in the receiving water at or beyond a 20 metre radius of the discharge point. (v) Cause at or beyond a 20 metre radius the following concentrations of contaminants to be exceeded: • 5 mg/m³ of total copper • 5 mg/m³ of total lead • 50 mg/m³ of total zinc • 50 g/m³ of suspended solids; and/or (vi) Contain more than: • 20 g/m³ of total petroleum hydrocarbons **Far North District Plan - Operative** Chapter 12 - Natural and Physical Resources Rule 12.3.6.1.1 Excavation and/or filling, excluding mining and quarrying, in the Rural Production Zone or kauri Cliffs Zone Excavation and/or filling, excluding mining and quarrying, on any site in the Rural Production Zone or Kauri Cliffs Zone is permitted, provided that: (a) it does not exceed 5,000m3 in any 12 month period per site; and (b) it does not involve a continuous cut or filled face exceeding an average of 1.5m in height over the length of the face i.e. the maximum permitted average cut and fill	**Erosion or damage to soil structure**	3	3	3	2	3	**14**
		Damage to archaeological features	3	3	3	2	3	**14**
	Northland Water and Soil Plan Regional Plan 32.1 GENERAL ENVIRONMENTAL STANDARDS 1. The short-term visual clarity of any permanently flowing river or wetland shall not be reduced by more than 40%, after reasonable mixing, due to sediment or sediment laden discharge originating from the site of the land disturbance activity.	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	2	2	1	**10**
		TOTAL SCORE (per criterion)	12	11	11	9	10	53
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	Northland Water and Soil Plan Regional Plan - ENVIRONMENTAL STANDARDS **[as for earthworks]** 33. RULES FOR LAND DISTURBANCE ACTIVITIES - **as for earthworks** 32.4 ENVIRONMENTAL STANDARDS FOR PLANTATION FORESTRY 2. During forest harvesting operations, all stem butts shall be raised above the ground when cable logging through the Riparian Management Zone. That is, when hauling the operation shall be undertaken in such a manner so as to minimise damage to remaining riparian vegetation. 3. Machines from ground harvesting operations shall not operate within 5 metres of the bed of a river, lake, indigenous wetland or the Coastal Marine Area other than at a designated crossing or on existing roads or tracks or to assist with directional felling or to lift the stem butt out of any river, lake, indigenous wetland or the Coastal marine Area ('Turning' or 'screwing' of machines shall not occur within 5 metres of the bed of a river, lake, indigenous wetland, or the Coastal Marine Area).	**Damage to archaeological features**	3	3	3	2	3	**14**
	34. RULES FOR LAND DISTURBANCE ACTIVITIES WITHIN THE RIPARIAN MANAGEMENT ZONE 2. Vegetation Clearance within the Riparian Management Zone is a permitted activity, provided that: (a) The Environmental Standards in Section 32 are complied with; and	**Degradation of significant terrestrial/ wetland biodiversity**	3	3	3	2	3	**14**
	FNDC 12.2.6.1.1 INDIGENOUS VEGETATION CLEARANCE PERMITTED THROUGHOUT THE DISTRICT Notwithstanding any rule in the Plan to the contrary but subject to Rules 12.5.6.1.1, 12.5.6.1.3 and 12.5.6.2.2 in the Heritage section of this Plan, indigenous vegetation clearance is permitted throughout the District where the clearance is for any of the following purposes: (a) clearance arising from plantation forestry or the cultivation or harvesting of crops including: (i) vegetation that has grown under and/or may have overtopped the plantation species; or (ii) areas of failed planting within the plantation forest in areas that have been cleared and planted within the past 30 years; or (iii) incidental damage and disturbance to indigenous vegetation adjacent to the crop where forestry best practice is followed; or (iv) clearance within 20m of a river associated with a river crossing that is provided for by a rule in a Regional Plan for Northland or by a resource consent granted by the Northland Regional Council, provided the clearance is less than 500m2 in any one instance.	**Erosion or damage to soil structure**	3	2	2	2	2	**11**
		Sediment discharge to waterways	3	3	3	3	3	**15**
		Deposition of woody debris into waterways	3	2	3	2	3	**13**
		Total score (per criterion)	**15**	**13**	**14**	**11**	**14**	**67**

Northland Region

Forestry activities	Activity Status and Rules	Associated potential effects	Northland Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
*Definitions from NES	Regional and District Plans Reviewed: Northland Water and Soil Plan Regional Plan Far North District Plan - Operative: Chapter 8 - Rural Environment and Chapter 12 - Natural and Physical Resources							
MECHANICAL LAND PREPARATION *Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the earthworks rules.*	**Northland Water and Soil Plan Regional Plan - GENERAL ENVIRONMENTAL STANDARDS [see earthworks]** **32.3 ENVIRONMENTAL STANDARDS FOR LAND PREPARATION** 1. Mechanical preparation of land, with the exception of subsurface drainage, shall be carried out parallel to the contour, where feasible. Where it is physically not possible to carry out land preparation parallel to the contour due to slope, sufficient runoff control measures shall be provided to prevent gully and rill erosion. 2. Windrows of slash shall be parallel to the contour to reduce sediment runoff. **32.4 ENVIRONMENTAL STANDARDS FOR PLANTATION FORESTRY** 4. Land preparation in the Riparian Management Zone is a permitted activity, provided that: (a) The Environmental Standards in Section 32 are complied with; and (b) The activity takes place outside a setback of 5 metres from the water body and the dominant slope is less than 15 degrees. **33. RULES FOR LAND DISTURBANCE ACTIVITIES - as for earthworks** **FNDC 12.2.6.1.1 INDIGENOUS VEGETATION CLEARANCE PERMITTED THROUGHOUT THE DISTRICT** Notwithstanding any rule in the Plan to the contrary but subject to Rules 12.5.6.1.1, 12.5.6.1.3 and 12.5.6.2.2 in the Heritage section of this Plan, indigenous vegetation clearance is permitted throughout the District where the clearance is for any of the following purposes: (a) clearance arising from plantation forestry or the cultivation or harvesting of crops including: (ii) areas of failed planting within the plantation forest in areas that have been cleared and planted within the past 30 years; [...] provided that no clearance is permitted of indigenous vegetation more than 10 years old to establish new exotic plantation forest;	**Erosion or damage to soil structure**	3	2	3	2	3	**13**
		Damage to archaeological features	3	3	3	2	3	**14**
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	**14**
		Sediment discharge to waterways	3	3	3	3	3	**15**
		Total score (per criterion)	**12**	**11**	**12**	**9**	**12**	**56**
PRUNING AND THINING TO WASTE *Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations that thin in excess of this limit are likely to have similar effects to harvesting operations and fall within the definition of harvesting.* *Thinning-to-waste operations leave the felled trees in situ. Note: Production thinning involves the removal of thinned trees for sale and falls within the definition of harvesting.*	**[As per harvesting]**	**Deposition of woody debris into waterways**	**3**	**3**	**3**	**2**	**3**	**14**
		Total score (per criterion)	**3**	**3**	**3**	**2**	**3**	**14**
FORESTRY QUARRYING *Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and vehicle issues associated with quarrying; councils retain their ability to address these matters.* *Scope includes the extraction of alluvial gravel outside river beds. Earthworks and mechanical land preparation do not fall within the scope of quarrying. Earthworks and mechanical land preparation are defined activities and are subject to specific controls.*	Northland Water and Soil Plan Regional Plan - 32. GENERAL ENVIRONMENTAL STANDARDS **[as for earthworks]** 33. RULES FOR LAND DISTURBANCE ACTIVITIES **- as for earthworks** **Far North District Plan - Operative** 8.8 Minerals Zone Farm and forestry quarries used to obtain material for internal roads on the production unit in which they are located, as contained in the definition of 'normal rural practices', are not subject to the provisions of the Minerals Zone. (Note from 12.3 Soil and Minerals: small scale farm and forest quarries obtaining roading material for use on the farm or forest production unit on which they are located are included in the definition of normal rural practices and are exempt from the rules on excavation and filling and on mining and quarrying.)	**Sediment discharge to waterways**	3	2	3	3	3	**14**

Northland Region

Forestry activities	Activity Status and Rules	Associated potential effects	Northland Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
*Definitions from NES	Regional and District Plans Reviewed: Northland Water and Soil Plan Regional Plan Far North District Plan - Operative: Chapter 8 - Rural Environment and Chapter 12 - Natural and Physical Resources							
		Erosion, soil loss or damage to soil structure	3	2	3	2	2	12
		Damage to archaeological features	3	3	3	2	3	14
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
		Total score (per criterion)	12	10	12	9	11	54
REPLANTING *Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.*	Northland Water and Soil Plan Regional Plan **32.1 GENERAL ENVIRONMENTAL STANDARDS** **7. To prevent erosion where vegetation clearance results in areas of exposed soil, these areas shall be revegetated as soon as practicable in the spring or autumn immediately following, to achieve an 80% ground cover within 24 months of the operation being completed.** **32.4 ENVIRONMENTAL STANDARDS FOR PLANTATION FORESTRY** **5. Where soil disturbance within the Riparian Management Zone results from harvesting an 80% ground cover shall be achieved within 12 months of the operation being completed.**	Increased environmental and property hazard	3	2	1	3	1	10
		Damage to archaeological features	3	3	3	2	3	14
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	14
		Compromise to future environmental potential	0	0	0	0	0	0
		Wilding pine spread	0	0	0	0	0	0
		Total score (per criterion)	9	8	7	7	7	10
RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river,* *lake or wetland, and associated bed disturbance.*	**29. RULES FOR STRUCTURES (OTHER THAN DAM STRUCTURES OR WEIRS) IN, ON, UNDER OR OVER THE BED OF A RIVER OR LAKE** **29.1 PERMITTED ACTIVITIES** 3. Culvert Crossings The use, placement, replacement, repair or alteration of a culvert crossing on the bed of a river or lake and any associated excavation or disturbance of the bed, and diversion of water through the structure, is a permitted activity, provided that: (a) The length of the culvert crossing does not exceed 25 metres and is of sufficient size to contain the bankfull flow without causing flooding onto neighbouring properties. (b) There are no adverse flooding or erosion effects on any upstream, adjoining or downstream properties as a result of the activity. (c) The works shall include the provision of an overland flowpath on the same property to ensure the safe passage of a 1 in 100 year period flood flow event. 4. The use, placement, repair or alteration of a single span bridge over the bed of a lake or river is a permitted activity, provided that: (a) No part of the bridge is in contact with the bed of the river or lake. (b) Any abutments are stabilised and protected against erosion. (c) The approaches to the bridge are constructed and maintained to minimise the discharge of contaminated runoff entering the water. (d) The activity does not take place in any dune lake listed in Schedule E; or an indigenous wetland; or a river, or section of river, or lake deemed to have outstanding values as shown in Appendix 18. (e) It is not regulated by Rule 27.03.02. **29.2 CONTROLLED ACTIVITIES** 2. The replacement of a culvert crossing or alterations or repairs to a culvert crossing which cannot meet the requirements of Rule 29.01.03 is a controlled activity, provided that: (a) The activity does not take place in any dune lake listed in Schedule E; or in an indigenous wetland, or in a river, or section or river, deemed to have outstanding values as shown in Appendix 18. (b) The activity shall not cause any change to the seasonal or annual range in water level or any indigenous wetland to an extent that it may adversely affect the wetland's natural ecosystem. (c) The structure does not prevent fish passage under any flow conditions. (d) The length of the culvert crossing does not exceed 25 metres.	Sedimentation of the water column and bed of the river	2	2	2	1	2	9
		Disruption of fish passage	3	3	3	2	3	14
		Damage to the river bed and downstream infrastructure	3	2	2	2	2	11
		Impediment to water flows	3	3	3	2	3	14
		Loss of instream habitat (fords) and spawning habitat	2	2	2	3	2	11
		Total score (per criterion)	13	12	12	10	12	59

OtagoRegion

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Plans Reviewed: Otago Regional Water Plan Queenstown Lakes District Plan Rural Areas - Rules		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	**Otago Regional Water Plan** No relevant rules observed. **Queenstown Lakes District Plan** Rural Areas - Rules 5.3.3.3 Discretionary Activities The following shall be Discretionary Activities, provided that they are not listed as a Prohibited or Non-Complying Activity and they comply with all of the relevant Zone Standards; and they have been evaluated under the assessment criteria in rule 5.4. Queenstown Lakes District Plan 5.4.2.3 Assessment Matters General xvii Discretionary activity – forestry (1) In considering whether the proposed forestry has the potential to cause wilding spread, the following matters shall be taken into account: (a) The species of trees proposed, and their potential to naturalise and spread; (b) The location of the site, having particular regard to the slope and the exposure to wind;	**Increased environmental and property hazard**	3	2	2	2	3	**12**
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/	3	3	3	2	3	**14**
		Compromise to future environmental potential	3	2	3	2	2	**12**
		Landscape/ amenity effects	3	2	3	2	3	**13**
		Wilding pine spread	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	15	12	14	10	14	**65**

EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction,* *landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Otago Regional Water Plan** 2.1.2 Sediment discharge to waterways Sediment discharges should not result in a conspicuous change to colour or visual clarity, nor noticeable local sedimentation, in the receiving water. That means you should not be able to see a dirty plume in the river at any time. This rule applies now. Work that exposes soil, such as tree harvesting, site development earthworks, ploughing, or using sacrificial or fallow paddocks, can result in sediment loss to waterways. Discharge from such activities is prohibited where no	**Sediment discharge to waterways**	3	3	3	2	3	**14**
		Erosion, soil loss or damage to soil structure	3	2	3	3	3	**14**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	2	1	1	**6**
		TOTAL SCORE (per criterion)	10	9	11	9	10	**49**

HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Otago Regional Water Plan** As for earthworks **Queenstown Lakes District Plan** Rural Areas - Rules 5.3.5 Standards 5.3.5.1 Site Standards x Indigenous Vegetation Earthworks provisions may apply(?)	**Damage to archaeological features**	1	3	3	2	1	**10**
		Degradation of significant terrestrial/	2	2	2	3	2	**11**
		Erosion or damage to soil structure	0	0	0	0	0	**0**
		Sediment discharge to waterways	3	2	3	1	2	**11**

OtagoRegion

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Plans Reviewed: Otago Regional Water Plan Queenstown Lakes District Plan Rural Areas - Rules		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiven	TOTAL SCORE (effect)
		Deposition of woody debris into waterways	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	6	7	8	6	5	**32**
MECHANICAL LAND PREPARATION Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-	No relevant rules observed, other than earthworks rules above	**Erosion or damage to soil structure**	1	2	3	2	2	**10**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	2	1	1	**6**
		Discharge of sediment and contaminants into waterways	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	8	9	11	8	9	**45**
PRUNING AND THINING TO WASTE Pruning involves the removal of branches from a tree. Thinning involves the selective	No relevant rules observed	**Deposition of woody debris into waterways**	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	0	0	0	0	0	**0**
FORESTRY QUARRYING Forestry quarrying is the extraction of rock,	No relevant rules observed other than earthworks rules above.	Sediment discharge to waterways	3	3	3	2	3	**14**
		Erosion, soil loss or damage to soil structure	3	2	3	3	3	**14**
		Damage to archaeological features	3	3	3	3	3	**15**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	2	1	1	**6**
		TOTAL SCORE (per criterion)	10	9	11	9	10	**49**
REPLANTING Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.	No relevant rules observed other than afforestation rules above.	**Increased environmental and property hazard**	3	3	3	2	3	**14**
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	3	3	3	2	3	**14**
		Compromise to future environmental potential	3	3	3	2	3	**14**
		Wilding pine spread	3	3	3	2	3	**14**
		TOTAL SCORE (per criterion)	12	12	12	8	12	**56**

OtagoRegion

Forestry activities	Activity Status and Rules	Associated potential effects	Risk assessment					
*Definitions from NES	Plans Reviewed: Otago Regional Water Plan Queenstown Lakes District Plan Rural Areas - Rules		Transparency	Effectiveness	Adaptability	Specificity	Comprehensivene	TOTAL SCORE (effect)
RIVER CROSSINGS River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.	**Otago Regional Water Plan** 13.2.1.7 The erection or placement of any bridge or culvert in, on or over the bed of a lake or river is a permitted activity, providing: (a) The size of the catchment upstream of the bridge or culvert is no more than 50 hectares in area; and (b) The bridge or culvert, or its erection or placement, does not cause any flooding, nor cause any erosion of the bed or banks of the lake or river; and (c) The site is left tidy following the erection or placement. 13.2.1.7B Unless covered by Rule 13.2.1.7 or 13.2.1.7A, the erection or placement of any crossing in or on the bed of a	**Sedimentation of the water column and bed of the river**	2	2	2	2	2	**10**
		Disruption of fish passage	3	3	3	1	3	**13**
		Damage to the river bed and downstream infrastructure	3	3	3	2	3	**14**
		Impediment to water flows	3	3	3	1	3	**13**
		Loss of instream habitat (fords) and spawning habitat	2	1	2	2	1	**8**
		TOTAL SCORE (per criterion)	13	12	13	8	12	**58**

Tasman District Council

Forestry activities	Activity Status and Rules	Associated potential effects	Tasman Resource Management Plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Tasman Resource Management Plan		Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
AFFORESTATION *Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land prior to planting.*	Tasman Resource Management Plan **Plantation Forests, Horticultural Plantings, Spray Belts and Shelter Belts Activities** **Rural 1 Zone** **Rule 17.5.4.1 Permitted activities** Planting of plantation forests, horticultural plantings, spray belts and shelter belts and the construction of artificial shelter is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions: Plantation Forest Setbacks (a) Plantation forests are set back at least: (i) 50 metres from a Residential Zone boundary; (ii) 30 metres from a dwelling; (iii) 10 metres from any boundary, except that:	**Increased environmental and property hazard**	3	3	3	1	3	**13**
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	2	2	2	1	2	**9**
		Compromise to future environmental potential	2	2	2	1	1	**8**
		Landscape/ amenity effects	3	3	3	1	3	**13**
		Wilding pine spread	1	2	3	1	2	**9**
		TOTAL SCORE (per criterion)	11	12	13	5	11	**52**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock. Includes forestry road and track construction, landing construction, stream crossing approaches, and cut and fill operation, but does not include soil disturbance by machinery passes.*	**Tasman Resource Management Plan** **18.5.2 Land Disturbance Area 1** **Rule 18.5.2.1 Permitted Activities (Land Disturbance)** **Earthworks** (i) No earthworks involving the placement or removal of soil or debris are undertaken within: (i) 50 metres of the coastal marine area adjacent to the Whanganui Inlet; (ii) 10 metres of the bed of any lake. (j) No earthworks involving the placement or removal of soil or debris is undertaken: (i) on land with a predominant slope of less than 20 degrees from horizontal that is within 10 metres of any bed of a river or stream greater than 3 metres average bed width; or (ii) on land with a predominant slope of 20 degrees or more from horizontal that is within 20 metres of any bed of a river or stream greater than 3 metres average bed width; except where it is for: (iii) the formation, construction, reconstruction, or removal of any road, track, firebreak, fence line, survey line, or utility service line for the sole purpose of crossing the river or stream; or (iv) the maintenance of any existing linear facility specified in (iii) above. (k) [(ia) Proposed 1 November 2008] No earthworks are undertaken within 200 metres of the coastal marine area, that is: (i) more than 1000 square metres in area, within any 12-month period; and either (ii) in a location that is visible from the coastal marine area or from any publicly accessible viewing point; or (iii) in a location adjoining any area with nationally or internationally important natural ecosystem values listed in **18.5.3 Land Disturbance Area 2** **18.5.3.1 Permitted Activities (Destruction or Removal of Vegetation, or Soil Disturbance) [18.6.7 Proposed]** **The destruction or removal of vegetation, soil disturbance or earthworks is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions:**	Sediment discharge to waterways	3	2	3	3	3	**14**
		Erosion, soil loss or damage to soil structure	3	2	2	3	2	**12**
		Damage to archaeological features	0	0	0	0	0	**0**

Tasman District Council

Forestry activities	Activity Status and Rules	Associated potential effects	Tasman Resource Management Plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Tasman Resource Management Plan		Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
	Tasman Resource Management Plan Chapter 36 - Rules for Contaminant Discharges **36.2.2.3 Discharge of Sediment or Debris from Land Disturbance Activities** The discharge into water of sediment or debris, or water that may contain sediment or debris, from any land disturbance activity, is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions: (a) The discharge is in such a manner that it does not cause any: (i) diverting or damming of any river or stream; or (ii) erosion of the bed of any river or stream; or (iii) discernible change to any habitat by deposition of sediment onto the bed of any water body or coastal water body. (b) No soil or debris is placed directly into a water body or the coastal marine area. (c) The discharge must not cause the visual clarity of the receiving water to change by more than 40 percent as measured by a black disc at any point more than: (i) 50 metres downstream where the wetted width of the river is less than 5 metres; or (ii) 100 metres downstream where the wetted width of the river is between 5 metres and 20 metres; or (iii) 200 metres downstream where the wetted width of the river is more than 20 metres; or (iv) 100 metres from the point of discharge in the coastal marine area; measured from the furthest downstream point of the discharge.	**Degradation of significant terrestrial/ wetland biodiversity**	1	1	1	1	1	**5**
		TOTAL SCORE (per criterion)	7	5	6	7	6	**31**
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include earthworks (such as earthworks to establish temporary or permanent access roads or landings).*	**Tasman Resource Management Plan** **18.5.2 Land Disturbance Area 1** **Rule 18.5.2.1 Permitted Activities (Land Disturbance)** The destruction or removal of vegetation, soil disturbance, or earthworks is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions: **All Land Disturbance** (b) All disturbed vegetation, soil, or debris is deposited or contained in such a manner that any movement of that disturbed vegetation, soil or debris into any water body or coastal water does not result in: (i) the diversion or damming of any river or stream; (ii) the erosion of the bed of any river or stream. (c) All disturbed vegetation, soil, or debris is deposited or contained or prevented from movement into water bodies so that any subsequent discharge of disturbed vegetation, soil or debris into any water body or coastal water is in such a way that it complies with rules 36.2.2.3 and 36.2.2.6. (d) All areas of bare ground created by the disturbance are protected from soil erosion by revegetation or any other method of protection, as soon as practicable, and in no case later than 12 months from the date of disturbance. (e) The destruction or removal of vegetation or soil disturbance by rootraking takes place only on land with a predominant slope less than 25 degrees from horizontal. (f) The destruction or removal of vegetation or soil disturbance by blading takes place only on land with a predominant	**Damage to archaeological features**	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	1	1	1	**5**
	See also Earthworks provisions	**Erosion or damage to soil structure**	3	2	2	3	2	**12**
		Sediment discharge to waterways	3	2	3	3	3	**14**
		Deposition of woody debris into waterways	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	10	7	9	9	9	**44**
MECHANICAL LAND PREPARATION Mechanical land preparation includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and associated removal of vegetation. V-blading involving disturbance of subsoil is considered under the	**See Harvesting and Earthworks provisions**	**Erosion or damage to soil structure**	3	2	2	3	2	**12**

Tasman District Council

Forestry activities	Activity Status and Rules	Associated potential effects	Tasman Resource Management Plan provisions Risk assessment Transparency	Effectiveness	Adaptability	Specificity	Comprehensive	TOTAL SCORE (effect)
*Definitions from NES	Regional and District Plans Reviewed: Tasman Resource Management Plan							
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	1	1	1	**5**
		Discharge of sediment and contaminants into waterways	3	2	3	3	3	**14**
		TOTAL SCORE (per criterion)	7	5	6	7	6	**31**
PRUNING AND THINING TO WASTE Pruning involves the removal of branches from a tree. Thinning involves the selective removal of trees within a stand. Thinning operations must leave a minimum of 250 stems per hectare. Thinning operations that thin in excess of this limit	**See Harvesting and Earthworks provisions**	**Deposition of woody debris into waterways**	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	3	2	3	2	3	**13**
FORESTRY QUARRYING Forestry quarrying is the extraction of rock, sand or gravel for the formation of forest roads. These controls do not address noise, vibration, dust and	**No Provisions - see Earthworks**	**Sediment discharge to waterways**	3	2	3	3	3	**14**
		Erosion or damage to soil structure	3	2	2	3	2	**12**
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	1	1	1	**5**
		TOTAL SCORE (per criterion)	7	5	6	7	6	**31**
REPLANTING Replanting is the planting of forest tree species over land where plantation forestry harvesting has occurred within the past five years.	**Refer afforestation above**	**Increased environmental and property hazard**	2	2	2	2	2	**10**
		Damage to archaeological features	0	0	0	0	0	**0**
		Degradation of significant terrestrial/ wetland biodiversity	1	1	1	1	1	**5**
		Compromise to future environmental potential	2	2	2	1	1	**8**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	5	5	5	4	4	**23**
RIVER CROSSINGS River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.	**Tasman Resource Management Plan** **Chapter 28: RULES FOR ACTIVITIES IN THE BEDS AND ON THE SURFACE OF RIVERS AND LAKES** **Rule 28.1.2.1 Permitted Activities (General)** Any activity in, on, or under the bed of a river or lake subject to rule 28.1.3.1, 28.1.4.1, 28.1.5.1, 28.1.6.1 or 28.1.7.1 is a permitted activity, if it also complies with the following general conditions, as applicable: (a) Any structure is not a dam or weir. (Refer to section 28.2.2) (b) Except as provided by rules 28.1.3.1, 28.1.4.1 or 28.1.5.1, any structure erected, constructed, or placed after 27 February 2010 is not in or on a lake or river identified in a water conservation order. (c) Any structure does not impede the flow of flood waters or cause any flooding or scour 29.2 CONTROLLED ACTIVITIES	**Sedimentation of the water column and bed of the river.**	2	2	3	1	2	**10**
		Disruption of fish passage	3	3	3	1	3	**13**
		Damage to the river bed and downstream infrastructure.	3	3	3	1	3	**13**
		Impediment to water flows	3	3	3	1	3	**13**
		Loss of instream habitat (fords) and spawning habitat	2	2	3	1	1	**9**
		Introduction of weeds/pests	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	13	13	15	5	12	**58**

Greater Wellington Forestry activities	Activity Status and Rules	Associated potential effects	Greater Wellington plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Regional Soil Plan Regional Freshwater Plan Wairarapa Combined District Plan - 4.5 Rural Zone		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
AFFORESTATION Afforestation is the act of planting a production forestry crop on land that is not currently in forest and has not been under plantation forestry cover within the past five years. Afforestation does not include the clearance of vegetation from the land	**Wairarapa Combined District Plan** 4.5 Rural Zone - Rules & Standards 4.5.1 Permitted Activities 4.5.2 Standards for Permitted Activities (j) Plantation Forestry (i) Plantation forestry shall be permitted provided it complies with the following standards:	**Increased environmental and property hazard**	3	2	1	3	2	**11**
		Damage to archaeological features	3	2	2	2	2	**11**
		Degradation of significant terrestrial/ wetland biodiversity	0	0	0	0	0	**0**
		Compromise to future environmental potential	0	0	0	0	0	**0**
		Landscape/ amenity effects	0	0	0	0	0	**0**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	6	4	3	5	4	**22**
EARTHWORKS *Earthworks is the modification of the shape of the ground surface by movement or removal of the surface of soil or rock*	**Regional Freshwater Plan for the Wellington Region** **Rule 1 Discharges of water and minor contaminants** **The discharge of contaminants, or water, into surface water, other than the discharge of stormwater, is a Permitted Activity provided the discharge complies**	**Sediment discharge to waterways**	3	2	2	3	3	**13**
	Regional Soil Plan for the Wellington region **Rule 1 Roading and Tracking** Any roading or tracking activity that is:	**Erosion, soil loss or damage to soil structure**	3	2	2	2	2	**11**
	Rule 2 Soil disturbance on erosion prone land Any soil disturbance on erosion prone land that:	**Damage to archaeological features**	3	2	2	2	2	**11**
	Wairarapa Combined District Plan Rule 21.6 Discretionary Activities The following are Discretionary Activities:	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	1	2	**11**
		TOTAL SCORE (per criterion)	12	8	9	8	9	**46**
HARVESTING *Harvesting is the act of felling and extracting trees and the associated soil disturbance. Harvesting does not include*	**Regional Soil Plan for the Wellington region** **Rule 2 Soil disturbance on erosion prone land** Any soil disturbance on erosion prone land that: (1) involves the disturbance of greater than or equal to 1,000 m3 of soil, within any	**Damage to archaeological features**	3	2	2	2	2	**11**
	Wairarapa Combined District Plan Rule 21.1.6 (Indigenous Vegetation and Habitats): **(a) Any activity involving disturbance, removal, damage or destruction ("modification") of kanuka, manuka and tauhinu.** **(b) Any activity involving disturbance, removal, damage or**	**Degradation of significant terrestrial/ wetland biodiversity**	3	2	3	1	2	**11**
	Rule 4 Vegetation disturbance on erosion prone land Any vegetation disturbance activity which is provided for by Rule 3 but does not	**Erosion or damage to soil structure**	3	2	3	2	2	**12**
	Regional Freshwater Plan for the Wellington Region Rule 1 Discharges of water and minor contaminants - **See earthworks**	**Sediment discharge to waterways**	3	2	2	3	3	**13**
		Deposition of woody debris into waterways	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	15	10	13	10	12	**60**
MECHANICAL LAND PREPARATION *Includes root raking, discing, mounding and spot mounding, contour and downhill ripping, roller crushing, other cultivation of land (including spot cultivation) and*	**Regional Soil Plan for the Wellington region** **Rule 2 Soil disturbance on erosion prone land - See Earthworks**	**Erosion or damage to soil structure**	2	1	2	2	1	**8**
		Damage to archaeological features	2	2	2	2	2	**10**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	1	2	**11**

Greater Wellington Forestry activities	Activity Status and Rules	Associated potential effects	Greater Wellington plan provisions Risk assessment					
*Definitions from NES	Regional and District Plans Reviewed: Regional Soil Plan Regional Freshwater Plan Wairarapa Combined District Plan - 4.5 Rural Zone		Transparency	Effectiveness	Adaptability	Specificity	Comprehensiveness	TOTAL SCORE (effect)
		Discharge of sediment and contaminants into waterways	3	2	2	3	3	**13**
		TOTAL SCORE (per criterion)	10	7	9	8	8	**42**
PRUNING AND THINING TO WASTE *Pruning involves the removal of branches*	**Regional Soil Plan for the Wellington region** **5.3 Rules for Vegetation Disturbance** - See Harvesting	**Deposition of woody debris into waterways**	3	2	3	2	3	**13**
		TOTAL SCORE (per criterion)	3	2	3	2	3	**13**
FORESTRY QUARRYING Forestry quarrying is the extraction of rock,	See Earthworks	**Sediment discharge to waterways**	3	2	2	3	3	**13**
		Erosion or damage to soil structure	3	2	2	2	2	**11**
		Damage to archaeological features	3	2	2	2	3	**12**
		Degradation of significant terrestrial/ wetland biodiversity	3	2	3	1	2	**11**
		TOTAL SCORE (per criterion)	12	8	9	8	10	**47**
REPLANTING Replanting is the planting of forest tree species over land where plantation forestry	**No specific rules observed**	**Increased environmental and property hazard**	3	2	1	3	2	**11**
		Damage to archaeological features	3	2	2	2	2	**11**
		Degradation of significant terrestrial/ wetland biodiversity	0	0	0	0	0	**0**
		Compromise to future environmental potential	0	0	0	0	0	**0**
		Wilding pine spread	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	6	4	3	5	4	**22**

RIVER CROSSINGS *River-crossing involves the installation, construction, placement, use, maintenance, alteration, removal or extension of a crossing in, on, under or over the bed of a river, lake or wetland, and associated bed disturbance.*	**Regional Freshwater Plan for the Wellington Region** **Rule 25 [River Crossings] in intermittently flowing streams** The placement and use, including any associated; • disturbance of any river bed; or • deposition on the river bed; or • temporary diversion; of any river crossing of a width necessary for the crossing, excluding any river crossing that dams a river, that is fixed in, on, under, or over the bed of any **Rule 31 Small bridges** The erection and maintenance of any bridge over a river bed, is a Permitted Activity provided the activity complies with the conditions specified below. **Rule 47 Culverts, weirs, fords, and bridges in rivers and streams** The placement and use of any river crossing [of a width necessary for the crossing, excluding any river crossing that dams a river], which is a culvert, weir, ford, or bridge across any river or stream, which is not a permitted activity, including any associated: • disturbance of river bed; or	**Sedimentation of the water column and bed of the river.**	3	2	3	1	2	**11**
		Disruption of fish passage	1	2	2	2	1	**8**
		Damage to the river bed and downstream infrastructure	3	2	3	2	3	**13**
		Impediment to water flows	2	1	3	2	2	**10**
		Loss of instream habitat (fords) and spawning habitat	0	0	0	0	0	**0**
		TOTAL SCORE (per criterion)	9	7	11	7	8	**42**