April 2023

Submission Document

Ministerial Inquiry into land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in Tairāwhiti/Gisborne District and Wairoa District

This submission is made on behalf of Glen Alvon Forest Partnership, managed by Roger Dickie NZ ltd

Submitter Background

Roger Dickie (N.Z.) Limited (RDNZ) is a forestry investment manager and licensed Managed Investment Scheme provider under the FMCA 2013. RDNZ's forest investment dates back more than 30 years including significant concentration of investment in the strong forest growing regions of New Zealand, namely the Gisborne and Wairoa districts.

RDNZ manages a total of 38,000 hectares including 21,200 hectares in the Gisborne and Wairoa districts, the subject of this enquiry. Of those investments, 10,275 hectares are retail syndicate (Partnership) investments owned by more than 1,100 investors, predominantly New Zealand Mum and Dad investors, the remaining properties are owned by family office and institutions of local and foreign origin.

The activities of RDNZ and its investors have materially contributed in a positive manner to the economy, employment, and the environment within these regions, as well, our managed area equates to 9.6% of the total forest area within the enquiry regions, making our forests and the investors we represent a significant forestry voice and related party to the enquiry.

Executive Summary

Forestry is a long-term investment that has from time to time been incentivised via the Government and regional councils to combat erosion and soil degradation, as well, to increase the productivity of some classes of land. The decision to invest in forestry has often been motivated by those prerogatives on top of forestry's alignment with the investors long-term investment drivers.

The heightening of weather events, which many associate with climate change, is the very reason greater levels of afforestation are necessary, especially in temperate and high rainfall areas where there is strong tree growth coupled with erodible land. A study by the Waikato District Council recommended that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes.

Other comparisons of production forestry and farming on hill country land are often made, with the results showing that forestry far exceeds farming with respect to expenditures, employment, export receipts and environmental impacts, including carbon sequestration and soil stabilisation.

Forest feasibility reports prepared for us by independent forest consultants project expenditure of more than $2,500 per ha average over the 28-to-30-year forest rotation, this expenditure is for management, harvesting and transport of our forests and does not include off farm added value at timber mills and export operations. Many of our forests that have completed harvesting have exceeded this expenditure figure. In contrast independent surveys in the Wairoa area have stated that average annual expenditure per ha over a 30-year period is $500 to $700 per ha (approximately 1/3 of forest expenditure).

In large weather events, mobilisation of debris will always happen, whether it be from forestry planted for production purposes, permanent crops, natives, riparian plantings, shelterbelts, fences, buildings etc. Take the Esk Valley for example, production forestry did not occur in this catchment in 1938, however the Esk Valley was severely impacted at this time by a weather event that caused three meters of silting and destroyed bridges from debris mobilisation.

Is forestry doing better, yes, can forestry do better, yes. The changes implemented by the National Environmental Standards for Plantation Forestry (NES-PF) mitigate debris left on slopes and ensure waterways are better protected; however, at the same time it can be argued that weather events are becoming more frequent and more severe.

The consenting obligations and practices required to uphold consents already impose significant costs on forest owners, those significant costs come on top of targeted forestry rates applied by the Councils in the enquiry regions. Forestry by-in-large is meeting these consenting requirements while paying higher (targeted) rates, begging the question, is forestry being provided the appropriate public infrastructure commensurate to its contribution to the regions.

How do we do more, there are short- and long-term solutions that need to be worked towards in conjunction with one another, RDNZ recommends the following:

- <u>Short Term Solutions:</u>

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap consenting requirements reduced, allowing slash traps to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- Standardisation of the interpretation of the NES-PF
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

RDNZ is strongly opposed to any recommendations of a move of production forests towards permanent forestry, select (non-clear fell) harvesting and harvest catchment restraints. Each of those strategies have dire consequences, including the destruction of statutory property rights.

The future of forestry needs to be supported here to retain investment in the subject regions. Production forestry is a major contributor to both GDP and employment in these regions and we as forest owners and managers are very aware of our social license to operate. You will be aware of many stories of forest companies helping the clean-up, some instances not remotely related to forestry, meanwhile we are yet to see a story of a farmer helping to remove the sedimentation deposited onto crops and homes.

RDNZ urges the Ministerial review to refrain from allowing the emotional element to supersede the economic, employment and environmental considerations of this matter. It is evident that the media and narrow voices can be powerful whilst ill informed. The New Zealand Government is responsible for seeing through emotional statements and to make decisions that protect the economic aspirations of the country whilst aligning to its policies and the policies that such forestry activities were implemented under.

History of the Land

For hundreds of years New Zealand underwent deforestation with much of this occurring in the 1800's and early 1900's, making way for what was thought to be productive farmland. For the Gisborne and Wairoa regions this was not always the case, with many highly erodible soils unable to withstand large precipitation events.

By the 1930's the Government was already embarking on a large-scale afforestation program under the State Forest Service to address issues of soil erosion and land degradation, and more recently in 1992, the Gisborne region established the 'Erosion Control Funding Programme' or 'ECFP', providing grants for production forestry to be established on erodible parts of farmland.

The ECFP never envisaged that these trees should be established on a permanent basis, in fact, the payments received under the ECFP were staggered as progress payments to make sure that trees established under the ECFP were appropriately tended (I.e., Thinned to a final crop stocking suitable for production harvest), implying that those trees should be harvested.

Volume of Water

The media and public opinion are quick to dismiss the severity of the weather events that are being endured, instead looking for the scapegoat. Any area of land or large catchment that receives +500mm of rainfall in a 24-hour period is going to have a high degree of sedimentation and debris mobilisation, if you then apply this rainfall to already water ladened soils, as we have seen, this delivers severe mid-slope failure.

Sedimentation

Afforestation of farmland was incentivised to help prevent mass erosion and sedimentation from farms into waterways which is then deposited onto other farmland, crops, and residential areas. As we have recently seen, this sedimentation is also responsible for damaging aquatic ecosystems such as the destruction of crustacean habitats near river mouths.

Sedimentation is driven mainly by precipitation, with geology and land use explaining much of the residual difference between sites. Studies by the Waikato District Council with reference to other independent reports, recommend that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes except for during harvest periods, however sediment loss, with good forest management is said to be restored to pre-harvest levels within one to two years.

While we are happy to support cost effective changes in the forestry sector that drive improved results, we are also acutely aware that this is a Land Use enquiry in the broader sense. We are confident when comparing farmland and forestry, that sedimentation arising from farmland has played a significant role in the damages resulting from Cyclone Gabrielle. Therefore, any result of this enquiry could not unjustly impact forestry without imposing consequences for sedimentation caused by farming.

Woody Debris & Harvest Slash

Woody debris can be defined as any dead, woody plant material, including logs, branches, standing dead trees, and root wads. Within the definition of woody debris are harvest residues, known as forestry slash.

Slash is a by-product of harvesting operations, ranging from the branches removed from logs to trees which don't meet commercial specs. Slash proves useful in returning nutrients to soils and assisting in providing cover for ground erosion, particularly in areas of highly erodible soil.

Woody debris left on stable ground present low risk of moving, however given the increasing effects of climate change and increasing likelihood of high-intensity rainfall events, managing debris such as harvest slash will continue to be an important topic in the forestry sector.

In large rainfall events, soil mobilisation, slope failure and rising water currents can all dislodge woody debris, moving them down slopes that lead to tributaries and rivers. The sheer volume of rainfall has dislodged Pine, Poplar, Regional Council Riparian plantings and native vegetation alike.

Land Use

It is important to consider the outcomes of different land uses when subject to extreme weather events such as January and February 2023. For the purpose of this, let's consider the three land uses below:

1) Farmland – Land solely used for farming has less root matter to bind the soil and allows water to quickly flow and carry high levels of sedimentation. The weight of sediment and speed of water would be expected to cause infrastructure washouts and high levels of sedimentation downstream.
2) Native Bush – Land solely in native bush will be able to sustain a level of rainfall by slowing movement, eventually mid-slope failure would happen, sedimentation levels would be low, but debris may include large trees that are likely to cause infrastructure washouts.
3) Harvesting Forests – The result would strike the middle ground as stumps help to bind the soils reducing sedimentation when compared with farmland, while smaller debris and logs may mobilise, causing infrastructure washouts.
4) Growing non harvested exotic forests (Radiata Pine). From the age of 3 or 4 years until harvest at 28 to 30 years a Radiata Pine production forest has showed many times in the past and again in Cyclone Gabrielle that there is little damage by way of washouts and off farm sedimentation. Photographs from Cyclone Gabrielle prove this, and our Sovereign Forest in the Wairoa area is a prime example. This forest is more than 20 years old and had a very low percentage of erosion during Cyclone Gabrielle, this is in contrast to the surrounding farmland which had massive slipping and slope movement resulting in huge volumes of sediment leaving the farms and entering waterways and damaging flood plains further down.

While the above analysis isn't scientifically proven for the purpose of this submission, it is plain to see that each land use has its own set of consequences. We must then include economic, employment and environmental considerations along with those results, to get the full picture.

Strongly Oppose - Permanent Forestry

Permanent forestry in the form of plantation (exotic) forestry or native forestry will ultimately have an undesirable set of consequences. If harsh rules were applied to foresters when managing their harvest, then the obvious choice would be for foresters to move away from production forestry to permanent carbon forestry, using the Emissions Trading Scheme to monetise additional stored carbon.

Permanent forestry will have a diminished benefit to the forest owner; however, it will have dire consequences both socially and environmentally. The harvest of forests would diminish in favour of low-cost forestry, diminishing employment and devaluing the land to zero or worse. Eventually those exotic trees will give way, becoming too heavy for the erodible soils, making it highly likely that much larger debris will mobilise.

Native permanent forestry is not feasible due to the very high costs of establishment and slow rate of carbon sequestration, such a mechanism to force native forestry without incentives or subsidies would drive foresters to relinquish land.

Strongly Oppose – Select (Non-Clear-Fell) Harvest

Select harvesting happens globally on land that is easy in contour allowing machinery to move through the forest or access stems from road carriages. The topography of land in the subject regions means that harvesting is almost always carried out via cable-based systems. Harvesting in these regions under cable-based systems is already hugely expensive and to work effectively, needs to allow for entire settings (faces) to be cleared. Any restriction to this activity would make the activity unsafe due to the confined zone of operation on erosion prone slopes requiring harvesting personnel to be present on the slopes. As well, forests opened up in strips allow for windthrow damage and potential mobilisation in forested areas alongside any strip harvesting. Any such restriction would not be feasible and would cause harvesting to cease in these areas, as well, such a restriction would slow the rate of harvest which removes the forester's ability to react to the commodity driven market.

Strongly Oppose – Catchment Restraints

Any maximum rate of harvest applied to any one catchment would considerably impede the forester's ability to optimise harvest age, act within financial covenants and react to financial markets, thus taking away fundamental property rights that go against freehold ownership of land. Any type of decision would drive large legal proceedings and seriously undermine confidence in freehold land rights and investment into forestry and other assets. Any catchment restraints would restrict forest owners' ability to harvest their forest in times when this is suitable weather (i.e., summer vs winter) or financial objectives. (i.e., a forest might be consented for only a part of the year where log prices are reduced).

Why Production Forestry

While the harvest process creates a short-term debris and sedimentation issue, the public have been very quick to dismiss the substantial environmental, social, and economic benefits of forestry, such as:

- Soil Conservation: Trees help to prevent soil erosion and maintain soil quality.
- Water Conservation: Forests help to regulate water flows and maintain water quality.
- Carbon Sequestration: Trees absorb and store carbon dioxide from the atmosphere, which helps to mitigate climate change.
- Biodiversity Conservation: Forests provide habitats for a wide range of plant and animal species, which helps to preserve biodiversity.
- Employment: Production forestry provides substantially more employment than comparative hill country farming operations. Forestry is said to employ one in four families in the Gisborne region, placing a huge importance of renewable and sustainable practices.

- Timber Production: Forests provide a renewable source of wood products, generating a perpetual supply of revenue through the rotational harvest of forests.
- Economic Contribution: Forestry is a significant primary sector, establishing large services sector expenditures and generating export receipts well in advance of comparative hill country farming.

Proposed Changes

While we are strongly against changes that only adhere to social drivers or that simply create further costs or barriers of entry in the form of consents, rates, or other inefficient taxations, we would be open to making pragmatic changes that further reduce or mitigate the likelihood of debris mobilising.

RDNZ suggests there are solutions that should be managed in conjunction with one another in order to achieve short term mitigation while incentivising programs and operations that form a solution while creating value. The movement toward biofuels and other fibre-based solutions coupled with the lack of pulp/woodchip processing facilities in the subject regions appears to present a real opportunity for the government to create positive solutions.

- Short Term Solutions:

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap requirements to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- The NES-PF has been established in relation to the events of 2018 in Gisborne. Our view is that the rules under the NES-PF are suitable to produce the desired outcome with respects to debris management. There needs to be stronger controls in the checks and balances as they relate to monitoring of consents and harvesting in all forests, but particularly red zoned land, which encompasses most of the forest in the Gisborne region. If all harvesting entities and forest managers complied at the higher level of the NES-PF we would significantly reduce the chance of debris mobilisation and the consideration of future land use changes.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
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The first two of these solutions enhance the climate obligations of New Zealand, one through the circular economy and the use of renewable energy, and the other by the reduction of carbon being released to the atmosphere. At the same time, they remove some or all of the financial burden to extract the material from harvested slopes. The third solution is carbon neutral.

Roger Dickie NZ Ltd and the 21,600 hectares for forestry that we manage though the enquiry area, remain strong focused on delivering the best economic, environmental, and social outcomes for the region and are committed to continued improvement in these aspects.

We would welcome the opportunity to speak to our submissions and are happy to be contacted for further information as required.

Regards,

Roger Dickie, Will Dickie, Jeff Dickie,

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Submission Document

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Permanent forestry will have a diminished benefit to the forest owner; however, it will have dire consequences both socially and environmentally. The harvest of forests would diminish in favour of low-cost forestry, diminishing employment and devaluing the land to zero or worse. Eventually those exotic trees will give way, becoming too heavy for the erodible soils, making it highly likely that much larger debris will mobilise.

Native permanent forestry is not feasible due to the very high costs of establishment and slow rate of carbon sequestration, such a mechanism to force native forestry without incentives or subsidies would drive foresters to relinquish land.

Strongly Oppose – Select (Non-Clear-Fell) Harvest

Select harvesting happens globally on land that is easy in contour allowing machinery to move through the forest or access stems from road carriages. The topography of land in the subject regions means that harvesting is almost always carried out via cable-based systems. Harvesting in these regions under cable-based systems is already hugely expensive and to work effectively, needs to allow for entire settings (faces) to be cleared. Any restriction to this activity would make the activity unsafe due to the confined zone of operation on erosion prone slopes requiring harvesting personnel to be present on the slopes. As well, forests opened up in strips allow for windthrow damage and potential mobilisation in forested areas alongside any strip harvesting. Any such restriction would not be feasible and would cause harvesting to cease in these areas, as well, such a restriction would slow the rate of harvest which removes the forester's ability to react to the commodity driven market.

Strongly Oppose – Catchment Restraints

Any maximum rate of harvest applied to any one catchment would considerably impede the forester's ability to optimise harvest age, act within financial covenants and react to financial markets, thus taking away fundamental property rights that go against freehold ownership of land. Any type of decision would drive large legal proceedings and seriously undermine confidence in freehold land rights and investment into forestry and other assets. Any catchment restraints would restrict forest owners' ability to harvest their forest in times when this is suitable weather (i.e., summer vs winter) or financial objectives. (i.e., a forest might be consented for only a part of the year where log prices are reduced).

Why Production Forestry

While the harvest process creates a short-term debris and sedimentation issue, the public have been very quick to dismiss the substantial environmental, social, and economic benefits of forestry, such as:

- Soil Conservation: Trees help to prevent soil erosion and maintain soil quality.
- Water Conservation: Forests help to regulate water flows and maintain water quality.
- Carbon Sequestration: Trees absorb and store carbon dioxide from the atmosphere, which helps to mitigate climate change.
- Biodiversity Conservation: Forests provide habitats for a wide range of plant and animal species, which helps to preserve biodiversity.
- Employment: Production forestry provides substantially more employment than comparative hill country farming operations. Forestry is said to employ one in four families in the Gisborne region, placing a huge importance of renewable and sustainable practices.

- Timber Production: Forests provide a renewable source of wood products, generating a perpetual supply of revenue through the rotational harvest of forests.
- Economic Contribution: Forestry is a significant primary sector, establishing large services sector expenditures and generating export receipts well in advance of comparative hill country farming.

Proposed Changes

While we are strongly against changes that only adhere to social drivers or that simply create further costs or barriers of entry in the form of consents, rates, or other inefficient taxations, we would be open to making pragmatic changes that further reduce or mitigate the likelihood of debris mobilising.

RDNZ suggests there are solutions that should be managed in conjunction with one another in order to achieve short term mitigation while incentivising programs and operations that form a solution while creating value. The movement toward biofuels and other fibre-based solutions coupled with the lack of pulp/woodchip processing facilities in the subject regions appears to present a real opportunity for the government to create positive solutions.

- Short Term Solutions:

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap requirements to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- The NES-PF has been established in relation to the events of 2018 in Gisborne. Our view is that the rules under the NES-PF are suitable to produce the desired outcome with respects to debris management. There needs to be stronger controls in the checks and balances as they relate to monitoring of consents and harvesting in all forests, but particularly red zoned land, which encompasses most of the forest in the Gisborne region. If all harvesting entities and forest managers complied at the higher level of the NES-PF we would significantly reduce the chance of debris mobilisation and the consideration of future land use changes.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

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- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

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The first two of these solutions enhance the climate obligations of New Zealand, one through the circular economy and the use of renewable energy, and the other by the reduction of carbon being released to the atmosphere. At the same time, they remove some or all of the financial burden to extract the material from harvested slopes. The third solution is carbon neutral.

Roger Dickie NZ Ltd and the 21,600 hectares for forestry that we manage though the enquiry area, remain strong focused on delivering the best economic, environmental, and social outcomes for the region and are committed to continued improvement in these aspects.

We would welcome the opportunity to speak to our submissions and are happy to be contacted for further information as required.

Regards,

Roger Dickie, Will Dickie, Jeff Dickie,

April 2023

Submission Document

Ministerial Inquiry into land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in Tairāwhiti/Gisborne District and Wairoa District

This submission is made on behalf of Eastwood forest Partnership, managed by Roger Dickie NZ ltd

Submitter Background

Roger Dickie (N.Z.) Limited (RDNZ) is a forestry investment manager and licensed Managed Investment Scheme provider under the FMCA 2013. RDNZ's forest investment dates back more than 30 years including significant concentration of investment in the strong forest growing regions of New Zealand, namely the Gisborne and Wairoa districts.

RDNZ manages a total of 38,000 hectares including 21,200 hectares in the Gisborne and Wairoa districts, the subject of this enquiry. Of those investments, 10,275 hectares are retail syndicate (Partnership) investments owned by more than 1,100 investors, predominantly New Zealand Mum and Dad investors, the remaining properties are owned by family office and institutions of local and foreign origin.

The activities of RDNZ and its investors have materially contributed in a positive manner to the economy, employment, and the environment within these regions, as well, our managed area equates to 9.6% of the total forest area within the enquiry regions, making our forests and the investors we represent a significant forestry voice and related party to the enquiry.

Executive Summary

Forestry is a long-term investment that has from time to time been incentivised via the Government and regional councils to combat erosion and soil degradation, as well, to increase the productivity of some classes of land. The decision to invest in forestry has often been motivated by those prerogatives on top of forestry's alignment with the investors long-term investment drivers.

The heightening of weather events, which many associate with climate change, is the very reason greater levels of afforestation are necessary, especially in temperate and high rainfall areas where there is strong tree growth coupled with erodible land. A study by the Waikato District Council recommended that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes.

Other comparisons of production forestry and farming on hill country land are often made, with the results showing that forestry far exceeds farming with respect to expenditures, employment, export receipts and environmental impacts, including carbon sequestration and soil stabilisation.

Forest feasibility reports prepared for us by independent forest consultants project expenditure of more than $2,500 per ha average over the 28-to-30-year forest rotation, this expenditure is for management, harvesting and transport of our forests and does not include off farm added value at timber mills and export operations. Many of our forests that have completed harvesting have exceeded this expenditure figure. In contrast independent surveys in the Wairoa area have stated that average annual expenditure per ha over a 30-year period is $500 to $700 per ha (approximately 1/3 of forest expenditure).

In large weather events, mobilisation of debris will always happen, whether it be from forestry planted for production purposes, permanent crops, natives, riparian plantings, shelterbelts, fences, buildings etc. Take the Esk Valley for example, production forestry did not occur in this catchment in 1938, however the Esk Valley was severely impacted at this time by a weather event that caused three meters of silting and destroyed bridges from debris mobilisation.

Is forestry doing better, yes, can forestry do better, yes. The changes implemented by the National Environmental Standards for Plantation Forestry (NES-PF) mitigate debris left on slopes and ensure waterways are better protected; however, at the same time it can be argued that weather events are becoming more frequent and more severe.

The consenting obligations and practices required to uphold consents already impose significant costs on forest owners, those significant costs come on top of targeted forestry rates applied by the Councils in the enquiry regions. Forestry by-in-large is meeting these consenting requirements while paying higher (targeted) rates, begging the question, is forestry being provided the appropriate public infrastructure commensurate to its contribution to the regions.

How do we do more, there are short- and long-term solutions that need to be worked towards in conjunction with one another, RDNZ recommends the following:

- <u>Short Term Solutions:</u>

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap consenting requirements reduced, allowing slash traps to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- Standardisation of the interpretation of the NES-PF
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

RDNZ is strongly opposed to any recommendations of a move of production forests towards permanent forestry, select (non-clear fell) harvesting and harvest catchment restraints. Each of those strategies have dire consequences, including the destruction of statutory property rights.

The future of forestry needs to be supported here to retain investment in the subject regions. Production forestry is a major contributor to both GDP and employment in these regions and we as forest owners and managers are very aware of our social license to operate. You will be aware of many stories of forest companies helping the clean-up, some instances not remotely related to forestry, meanwhile we are yet to see a story of a farmer helping to remove the sedimentation deposited onto crops and homes.

RDNZ urges the Ministerial review to refrain from allowing the emotional element to supersede the economic, employment and environmental considerations of this matter. It is evident that the media and narrow voices can be powerful whilst ill informed. The New Zealand Government is responsible for seeing through emotional statements and to make decisions that protect the economic aspirations of the country whilst aligning to its policies and the policies that such forestry activities were implemented under.

History of the Land

For hundreds of years New Zealand underwent deforestation with much of this occurring in the 1800's and early 1900's, making way for what was thought to be productive farmland. For the Gisborne and Wairoa regions this was not always the case, with many highly erodible soils unable to withstand large precipitation events.

By the 1930's the Government was already embarking on a large-scale afforestation program under the State Forest Service to address issues of soil erosion and land degradation, and more recently in 1992, the Gisborne region established the 'Erosion Control Funding Programme' or 'ECFP', providing grants for production forestry to be established on erodible parts of farmland.

The ECFP never envisaged that these trees should be established on a permanent basis, in fact, the payments received under the ECFP were staggered as progress payments to make sure that trees established under the ECFP were appropriately tended (I.e., Thinned to a final crop stocking suitable for production harvest), implying that those trees should be harvested.

Volume of Water

The media and public opinion are quick to dismiss the severity of the weather events that are being endured, instead looking for the scapegoat. Any area of land or large catchment that receives +500mm of rainfall in a 24-hour period is going to have a high degree of sedimentation and debris mobilisation, if you then apply this rainfall to already water ladened soils, as we have seen, this delivers severe mid-slope failure.

Sedimentation

Afforestation of farmland was incentivised to help prevent mass erosion and sedimentation from farms into waterways which is then deposited onto other farmland, crops, and residential areas. As we have recently seen, this sedimentation is also responsible for damaging aquatic ecosystems such as the destruction of crustacean habitats near river mouths.

Sedimentation is driven mainly by precipitation, with geology and land use explaining much of the residual difference between sites. Studies by the Waikato District Council with reference to other independent reports, recommend that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes except for during harvest periods, however sediment loss, with good forest management is said to be restored to pre-harvest levels within one to two years.

While we are happy to support cost effective changes in the forestry sector that drive improved results, we are also acutely aware that this is a Land Use enquiry in the broader sense. We are confident when comparing farmland and forestry, that sedimentation arising from farmland has played a significant role in the damages resulting from Cyclone Gabrielle. Therefore, any result of this enquiry could not unjustly impact forestry without imposing consequences for sedimentation caused by farming.

Woody Debris & Harvest Slash

Woody debris can be defined as any dead, woody plant material, including logs, branches, standing dead trees, and root wads. Within the definition of woody debris are harvest residues, known as forestry slash.

Slash is a by-product of harvesting operations, ranging from the branches removed from logs to trees which don't meet commercial specs. Slash proves useful in returning nutrients to soils and assisting in providing cover for ground erosion, particularly in areas of highly erodible soil.

Woody debris left on stable ground present low risk of moving, however given the increasing effects of climate change and increasing likelihood of high-intensity rainfall events, managing debris such as harvest slash will continue to be an important topic in the forestry sector.

In large rainfall events, soil mobilisation, slope failure and rising water currents can all dislodge woody debris, moving them down slopes that lead to tributaries and rivers. The sheer volume of rainfall has dislodged Pine, Poplar, Regional Council Riparian plantings and native vegetation alike.

Land Use

It is important to consider the outcomes of different land uses when subject to extreme weather events such as January and February 2023. For the purpose of this, let's consider the three land uses below:

1) Farmland – Land solely used for farming has less root matter to bind the soil and allows water to quickly flow and carry high levels of sedimentation. The weight of sediment and speed of water would be expected to cause infrastructure washouts and high levels of sedimentation downstream.
2) Native Bush – Land solely in native bush will be able to sustain a level of rainfall by slowing movement, eventually mid-slope failure would happen, sedimentation levels would be low, but debris may include large trees that are likely to cause infrastructure washouts.
3) Harvesting Forests – The result would strike the middle ground as stumps help to bind the soils reducing sedimentation when compared with farmland, while smaller debris and logs may mobilise, causing infrastructure washouts.
4) Growing non harvested exotic forests (Radiata Pine). From the age of 3 or 4 years until harvest at 28 to 30 years a Radiata Pine production forest has showed many times in the past and again in Cyclone Gabrielle that there is little damage by way of washouts and off farm sedimentation. Photographs from Cyclone Gabrielle prove this, and our Sovereign Forest in the Wairoa area is a prime example. This forest is more than 20 years old and had a very low percentage of erosion during Cyclone Gabrielle, this is in contrast to the surrounding farmland which had massive slipping and slope movement resulting in huge volumes of sediment leaving the farms and entering waterways and damaging flood plains further down.

While the above analysis isn't scientifically proven for the purpose of this submission, it is plain to see that each land use has its own set of consequences. We must then include economic, employment and environmental considerations along with those results, to get the full picture.

Strongly Oppose - Permanent Forestry

Permanent forestry in the form of plantation (exotic) forestry or native forestry will ultimately have an undesirable set of consequences. If harsh rules were applied to foresters when managing their harvest, then the obvious choice would be for foresters to move away from production forestry to permanent carbon forestry, using the Emissions Trading Scheme to monetise additional stored carbon.

Permanent forestry will have a diminished benefit to the forest owner; however, it will have dire consequences both socially and environmentally. The harvest of forests would diminish in favour of low-cost forestry, diminishing employment and devaluing the land to zero or worse. Eventually those exotic trees will give way, becoming too heavy for the erodible soils, making it highly likely that much larger debris will mobilise.

Native permanent forestry is not feasible due to the very high costs of establishment and slow rate of carbon sequestration, such a mechanism to force native forestry without incentives or subsidies would drive foresters to relinquish land.

Strongly Oppose – Select (Non-Clear-Fell) Harvest

Select harvesting happens globally on land that is easy in contour allowing machinery to move through the forest or access stems from road carriages. The topography of land in the subject regions means that harvesting is almost always carried out via cable-based systems. Harvesting in these regions under cable-based systems is already hugely expensive and to work effectively, needs to allow for entire settings (faces) to be cleared. Any restriction to this activity would make the activity unsafe due to the confined zone of operation on erosion prone slopes requiring harvesting personnel to be present on the slopes. As well, forests opened up in strips allow for windthrow damage and potential mobilisation in forested areas alongside any strip harvesting. Any such restriction would not be feasible and would cause harvesting to cease in these areas, as well, such a restriction would slow the rate of harvest which removes the forester's ability to react to the commodity driven market.

Strongly Oppose – Catchment Restraints

Any maximum rate of harvest applied to any one catchment would considerably impede the forester's ability to optimise harvest age, act within financial covenants and react to financial markets, thus taking away fundamental property rights that go against freehold ownership of land. Any type of decision would drive large legal proceedings and seriously undermine confidence in freehold land rights and investment into forestry and other assets. Any catchment restraints would restrict forest owners' ability to harvest their forest in times when this is suitable weather (i.e., summer vs winter) or financial objectives. (i.e., a forest might be consented for only a part of the year where log prices are reduced).

Why Production Forestry

While the harvest process creates a short-term debris and sedimentation issue, the public have been very quick to dismiss the substantial environmental, social, and economic benefits of forestry, such as:

- Soil Conservation: Trees help to prevent soil erosion and maintain soil quality.
- Water Conservation: Forests help to regulate water flows and maintain water quality.
- Carbon Sequestration: Trees absorb and store carbon dioxide from the atmosphere, which helps to mitigate climate change.
- Biodiversity Conservation: Forests provide habitats for a wide range of plant and animal species, which helps to preserve biodiversity.
- Employment: Production forestry provides substantially more employment than comparative hill country farming operations. Forestry is said to employ one in four families in the Gisborne region, placing a huge importance of renewable and sustainable practices.

- Timber Production: Forests provide a renewable source of wood products, generating a perpetual supply of revenue through the rotational harvest of forests.
- Economic Contribution: Forestry is a significant primary sector, establishing large services sector expenditures and generating export receipts well in advance of comparative hill country farming.

Proposed Changes

While we are strongly against changes that only adhere to social drivers or that simply create further costs or barriers of entry in the form of consents, rates, or other inefficient taxations, we would be open to making pragmatic changes that further reduce or mitigate the likelihood of debris mobilising.

RDNZ suggests there are solutions that should be managed in conjunction with one another in order to achieve short term mitigation while incentivising programs and operations that form a solution while creating value. The movement toward biofuels and other fibre-based solutions coupled with the lack of pulp/woodchip processing facilities in the subject regions appears to present a real opportunity for the government to create positive solutions.

- Short Term Solutions:

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap requirements to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- The NES-PF has been established in relation to the events of 2018 in Gisborne. Our view is that the rules under the NES-PF are suitable to produce the desired outcome with respects to debris management. There needs to be stronger controls in the checks and balances as they relate to monitoring of consents and harvesting in all forests, but particularly red zoned land, which encompasses most of the forest in the Gisborne region. If all harvesting entities and forest managers complied at the higher level of the NES-PF we would significantly reduce the chance of debris mobilisation and the consideration of future land use changes.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
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The first two of these solutions enhance the climate obligations of New Zealand, one through the circular economy and the use of renewable energy, and the other by the reduction of carbon being released to the atmosphere. At the same time, they remove some or all of the financial burden to extract the material from harvested slopes. The third solution is carbon neutral.

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We would welcome the opportunity to speak to our submissions and are happy to be contacted for further information as required.

Regards,

Roger Dickie, Will Dickie, Jeff Dickie,

April 2023

Submission Document

Ministerial Inquiry into land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in Tairāwhiti/Gisborne District and Wairoa District

This submission is made on behalf of Chatswood forest Partnership, managed by Roger Dickie NZ ltd

Submitter Background

Roger Dickie (N.Z.) Limited (RDNZ) is a forestry investment manager and licensed Managed Investment Scheme provider under the FMCA 2013. RDNZ's forest investment dates back more than 30 years including significant concentration of investment in the strong forest growing regions of New Zealand, namely the Gisborne and Wairoa districts.

RDNZ manages a total of 38,000 hectares including 21,200 hectares in the Gisborne and Wairoa districts, the subject of this enquiry. Of those investments, 10,275 hectares are retail syndicate (Partnership) investments owned by more than 1,100 investors, predominantly New Zealand Mum and Dad investors, the remaining properties are owned by family office and institutions of local and foreign origin.

The activities of RDNZ and its investors have materially contributed in a positive manner to the economy, employment, and the environment within these regions, as well, our managed area equates to 9.6% of the total forest area within the enquiry regions, making our forests and the investors we represent a significant forestry voice and related party to the enquiry.

Executive Summary

Forestry is a long-term investment that has from time to time been incentivised via the Government and regional councils to combat erosion and soil degradation, as well, to increase the productivity of some classes of land. The decision to invest in forestry has often been motivated by those prerogatives on top of forestry's alignment with the investors long-term investment drivers.

The heightening of weather events, which many associate with climate change, is the very reason greater levels of afforestation are necessary, especially in temperate and high rainfall areas where there is strong tree growth coupled with erodible land. A study by the Waikato District Council recommended that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes.

Other comparisons of production forestry and farming on hill country land are often made, with the results showing that forestry far exceeds farming with respect to expenditures, employment, export receipts and environmental impacts, including carbon sequestration and soil stabilisation.

Forest feasibility reports prepared for us by independent forest consultants project expenditure of more than $2,500 per ha average over the 28-to-30-year forest rotation, this expenditure is for management, harvesting and transport of our forests and does not include off farm added value at timber mills and export operations. Many of our forests that have completed harvesting have exceeded this expenditure figure. In contrast independent surveys in the Wairoa area have stated that average annual expenditure per ha over a 30-year period is $500 to $700 per ha (approximately 1/3 of forest expenditure).

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How do we do more, there are short- and long-term solutions that need to be worked towards in conjunction with one another, RDNZ recommends the following:

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- Standardisation of the interpretation of the NES-PF
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
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RDNZ is strongly opposed to any recommendations of a move of production forests towards permanent forestry, select (non-clear fell) harvesting and harvest catchment restraints. Each of those strategies have dire consequences, including the destruction of statutory property rights.

The future of forestry needs to be supported here to retain investment in the subject regions. Production forestry is a major contributor to both GDP and employment in these regions and we as forest owners and managers are very aware of our social license to operate. You will be aware of many stories of forest companies helping the clean-up, some instances not remotely related to forestry, meanwhile we are yet to see a story of a farmer helping to remove the sedimentation deposited onto crops and homes.

RDNZ urges the Ministerial review to refrain from allowing the emotional element to supersede the economic, employment and environmental considerations of this matter. It is evident that the media and narrow voices can be powerful whilst ill informed. The New Zealand Government is responsible for seeing through emotional statements and to make decisions that protect the economic aspirations of the country whilst aligning to its policies and the policies that such forestry activities were implemented under.

History of the Land

For hundreds of years New Zealand underwent deforestation with much of this occurring in the 1800's and early 1900's, making way for what was thought to be productive farmland. For the Gisborne and Wairoa regions this was not always the case, with many highly erodible soils unable to withstand large precipitation events.

By the 1930's the Government was already embarking on a large-scale afforestation program under the State Forest Service to address issues of soil erosion and land degradation, and more recently in 1992, the Gisborne region established the 'Erosion Control Funding Programme' or 'ECFP', providing grants for production forestry to be established on erodible parts of farmland.

The ECFP never envisaged that these trees should be established on a permanent basis, in fact, the payments received under the ECFP were staggered as progress payments to make sure that trees established under the ECFP were appropriately tended (I.e., Thinned to a final crop stocking suitable for production harvest), implying that those trees should be harvested.

Volume of Water

The media and public opinion are quick to dismiss the severity of the weather events that are being endured, instead looking for the scapegoat. Any area of land or large catchment that receives +500mm of rainfall in a 24-hour period is going to have a high degree of sedimentation and debris mobilisation, if you then apply this rainfall to already water ladened soils, as we have seen, this delivers severe mid-slope failure.

Sedimentation

Afforestation of farmland was incentivised to help prevent mass erosion and sedimentation from farms into waterways which is then deposited onto other farmland, crops, and residential areas. As we have recently seen, this sedimentation is also responsible for damaging aquatic ecosystems such as the destruction of crustacean habitats near river mouths.

Sedimentation is driven mainly by precipitation, with geology and land use explaining much of the residual difference between sites. Studies by the Waikato District Council with reference to other independent reports, recommend that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes except for during harvest periods, however sediment loss, with good forest management is said to be restored to pre-harvest levels within one to two years.

While we are happy to support cost effective changes in the forestry sector that drive improved results, we are also acutely aware that this is a Land Use enquiry in the broader sense. We are confident when comparing farmland and forestry, that sedimentation arising from farmland has played a significant role in the damages resulting from Cyclone Gabrielle. Therefore, any result of this enquiry could not unjustly impact forestry without imposing consequences for sedimentation caused by farming.

Woody Debris & Harvest Slash

Woody debris can be defined as any dead, woody plant material, including logs, branches, standing dead trees, and root wads. Within the definition of woody debris are harvest residues, known as forestry slash.

Slash is a by-product of harvesting operations, ranging from the branches removed from logs to trees which don't meet commercial specs. Slash proves useful in returning nutrients to soils and assisting in providing cover for ground erosion, particularly in areas of highly erodible soil.

Woody debris left on stable ground present low risk of moving, however given the increasing effects of climate change and increasing likelihood of high-intensity rainfall events, managing debris such as harvest slash will continue to be an important topic in the forestry sector.

In large rainfall events, soil mobilisation, slope failure and rising water currents can all dislodge woody debris, moving them down slopes that lead to tributaries and rivers. The sheer volume of rainfall has dislodged Pine, Poplar, Regional Council Riparian plantings and native vegetation alike.

Land Use

It is important to consider the outcomes of different land uses when subject to extreme weather events such as January and February 2023. For the purpose of this, let's consider the three land uses below:

1) Farmland – Land solely used for farming has less root matter to bind the soil and allows water to quickly flow and carry high levels of sedimentation. The weight of sediment and speed of water would be expected to cause infrastructure washouts and high levels of sedimentation downstream.
2) Native Bush – Land solely in native bush will be able to sustain a level of rainfall by slowing movement, eventually mid-slope failure would happen, sedimentation levels would be low, but debris may include large trees that are likely to cause infrastructure washouts.
3) Harvesting Forests – The result would strike the middle ground as stumps help to bind the soils reducing sedimentation when compared with farmland, while smaller debris and logs may mobilise, causing infrastructure washouts.
4) Growing non harvested exotic forests (Radiata Pine). From the age of 3 or 4 years until harvest at 28 to 30 years a Radiata Pine production forest has showed many times in the past and again in Cyclone Gabrielle that there is little damage by way of washouts and off farm sedimentation. Photographs from Cyclone Gabrielle prove this, and our Sovereign Forest in the Wairoa area is a prime example. This forest is more than 20 years old and had a very low percentage of erosion during Cyclone Gabrielle, this is in contrast to the surrounding farmland which had massive slipping and slope movement resulting in huge volumes of sediment leaving the farms and entering waterways and damaging flood plains further down.

While the above analysis isn't scientifically proven for the purpose of this submission, it is plain to see that each land use has its own set of consequences. We must then include economic, employment and environmental considerations along with those results, to get the full picture.

Strongly Oppose - Permanent Forestry

Permanent forestry in the form of plantation (exotic) forestry or native forestry will ultimately have an undesirable set of consequences. If harsh rules were applied to foresters when managing their harvest, then the obvious choice would be for foresters to move away from production forestry to permanent carbon forestry, using the Emissions Trading Scheme to monetise additional stored carbon.

Permanent forestry will have a diminished benefit to the forest owner; however, it will have dire consequences both socially and environmentally. The harvest of forests would diminish in favour of low-cost forestry, diminishing employment and devaluing the land to zero or worse. Eventually those exotic trees will give way, becoming too heavy for the erodible soils, making it highly likely that much larger debris will mobilise.

Native permanent forestry is not feasible due to the very high costs of establishment and slow rate of carbon sequestration, such a mechanism to force native forestry without incentives or subsidies would drive foresters to relinquish land.

Strongly Oppose – Select (Non-Clear-Fell) Harvest

Select harvesting happens globally on land that is easy in contour allowing machinery to move through the forest or access stems from road carriages. The topography of land in the subject regions means that harvesting is almost always carried out via cable-based systems. Harvesting in these regions under cable-based systems is already hugely expensive and to work effectively, needs to allow for entire settings (faces) to be cleared. Any restriction to this activity would make the activity unsafe due to the confined zone of operation on erosion prone slopes requiring harvesting personnel to be present on the slopes. As well, forests opened up in strips allow for windthrow damage and potential mobilisation in forested areas alongside any strip harvesting. Any such restriction would not be feasible and would cause harvesting to cease in these areas, as well, such a restriction would slow the rate of harvest which removes the forester's ability to react to the commodity driven market.

Strongly Oppose – Catchment Restraints

Any maximum rate of harvest applied to any one catchment would considerably impede the forester's ability to optimise harvest age, act within financial covenants and react to financial markets, thus taking away fundamental property rights that go against freehold ownership of land. Any type of decision would drive large legal proceedings and seriously undermine confidence in freehold land rights and investment into forestry and other assets. Any catchment restraints would restrict forest owners' ability to harvest their forest in times when this is suitable weather (i.e., summer vs winter) or financial objectives. (i.e., a forest might be consented for only a part of the year where log prices are reduced).

Why Production Forestry

While the harvest process creates a short-term debris and sedimentation issue, the public have been very quick to dismiss the substantial environmental, social, and economic benefits of forestry, such as:

- Soil Conservation: Trees help to prevent soil erosion and maintain soil quality.
- Water Conservation: Forests help to regulate water flows and maintain water quality.
- Carbon Sequestration: Trees absorb and store carbon dioxide from the atmosphere, which helps to mitigate climate change.
- Biodiversity Conservation: Forests provide habitats for a wide range of plant and animal species, which helps to preserve biodiversity.
- Employment: Production forestry provides substantially more employment than comparative hill country farming operations. Forestry is said to employ one in four families in the Gisborne region, placing a huge importance of renewable and sustainable practices.

- Timber Production: Forests provide a renewable source of wood products, generating a perpetual supply of revenue through the rotational harvest of forests.
- Economic Contribution: Forestry is a significant primary sector, establishing large services sector expenditures and generating export receipts well in advance of comparative hill country farming.

Proposed Changes

While we are strongly against changes that only adhere to social drivers or that simply create further costs or barriers of entry in the form of consents, rates, or other inefficient taxations, we would be open to making pragmatic changes that further reduce or mitigate the likelihood of debris mobilising.

RDNZ suggests there are solutions that should be managed in conjunction with one another in order to achieve short term mitigation while incentivising programs and operations that form a solution while creating value. The movement toward biofuels and other fibre-based solutions coupled with the lack of pulp/woodchip processing facilities in the subject regions appears to present a real opportunity for the government to create positive solutions.

- Short Term Solutions:

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap requirements to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- The NES-PF has been established in relation to the events of 2018 in Gisborne. Our view is that the rules under the NES-PF are suitable to produce the desired outcome with respects to debris management. There needs to be stronger controls in the checks and balances as they relate to monitoring of consents and harvesting in all forests, but particularly red zoned land, which encompasses most of the forest in the Gisborne region. If all harvesting entities and forest managers complied at the higher level of the NES-PF we would significantly reduce the chance of debris mobilisation and the consideration of future land use changes.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

-

The first two of these solutions enhance the climate obligations of New Zealand, one through the circular economy and the use of renewable energy, and the other by the reduction of carbon being released to the atmosphere. At the same time, they remove some or all of the financial burden to extract the material from harvested slopes. The third solution is carbon neutral.

Roger Dickie NZ Ltd and the 21,600 hectares for forestry that we manage though the enquiry area, remain strong focused on delivering the best economic, environmental, and social outcomes for the region and are committed to continued improvement in these aspects.

We would welcome the opportunity to speak to our submissions and are happy to be contacted for further information as required.

Regards,

Roger Dickie, Will Dickie, Jeff Dickie,

April 2023

Submission Document

Ministerial Inquiry into land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in Tairāwhiti/Gisborne District and Wairoa District

This submission is made on behalf of Greenwood Forest Partnership, managed by Roger Dickie NZ ltd

Submitter Background

Roger Dickie (N.Z.) Limited (RDNZ) is a forestry investment manager and licensed Managed Investment Scheme provider under the FMCA 2013. RDNZ's forest investment dates back more than 30 years including significant concentration of investment in the strong forest growing regions of New Zealand, namely the Gisborne and Wairoa districts.

RDNZ manages a total of 38,000 hectares including 21,200 hectares in the Gisborne and Wairoa districts, the subject of this enquiry. Of those investments, 10,275 hectares are retail syndicate (Partnership) investments owned by more than 1,100 investors, predominantly New Zealand Mum and Dad investors, the remaining properties are owned by family office and institutions of local and foreign origin.

The activities of RDNZ and its investors have materially contributed in a positive manner to the economy, employment, and the environment within these regions, as well, our managed area equates to 9.6% of the total forest area within the enquiry regions, making our forests and the investors we represent a significant forestry voice and related party to the enquiry.

Executive Summary

Forestry is a long-term investment that has from time to time been incentivised via the Government and regional councils to combat erosion and soil degradation, as well, to increase the productivity of some classes of land. The decision to invest in forestry has often been motivated by those prerogatives on top of forestry's alignment with the investors long-term investment drivers.

The heightening of weather events, which many associate with climate change, is the very reason greater levels of afforestation are necessary, especially in temperate and high rainfall areas where there is strong tree growth coupled with erodible land. A study by the Waikato District Council recommended that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes.

Other comparisons of production forestry and farming on hill country land are often made, with the results showing that forestry far exceeds farming with respect to expenditures, employment, export receipts and environmental impacts, including carbon sequestration and soil stabilisation.

Forest feasibility reports prepared for us by independent forest consultants project expenditure of more than $2,500 per ha average over the 28-to-30-year forest rotation, this expenditure is for management, harvesting and transport of our forests and does not include off farm added value at timber mills and export operations. Many of our forests that have completed harvesting have exceeded this expenditure figure. In contrast independent surveys in the Wairoa area have stated that average annual expenditure per ha over a 30-year period is $500 to $700 per ha (approximately 1/3 of forest expenditure).

In large weather events, mobilisation of debris will always happen, whether it be from forestry planted for production purposes, permanent crops, natives, riparian plantings, shelterbelts, fences, buildings etc. Take the Esk Valley for example, production forestry did not occur in this catchment in 1938, however the Esk Valley was severely impacted at this time by a weather event that caused three meters of silting and destroyed bridges from debris mobilisation.

Is forestry doing better, yes, can forestry do better, yes. The changes implemented by the National Environmental Standards for Plantation Forestry (NES-PF) mitigate debris left on slopes and ensure waterways are better protected; however, at the same time it can be argued that weather events are becoming more frequent and more severe.

The consenting obligations and practices required to uphold consents already impose significant costs on forest owners, those significant costs come on top of targeted forestry rates applied by the Councils in the enquiry regions. Forestry by-in-large is meeting these consenting requirements while paying higher (targeted) rates, begging the question, is forestry being provided the appropriate public infrastructure commensurate to its contribution to the regions.

How do we do more, there are short- and long-term solutions that need to be worked towards in conjunction with one another, RDNZ recommends the following:

- <u>Short Term Solutions:</u>

- Harvest activities that occur on high-risk areas (High-LUC, High-ESC) where slopes are immediately adjacent to waterways or host upstream catchments exceeding a minimum threshold should require a riparian buffer zone be maintained at harvest.
- Slash-Trap consenting requirements reduced, allowing slash traps to be implemented with lower thresholds and greater carrying capacity to sustain higher intensity weather events.
- Standardisation of the interpretation of the NES-PF
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

- Long Term Solutions:

- The Forestry Transformational Plan intends to incentivise greater domestic processing, clearly the Government should incentivise or co-invest in woodchip and fibre projects to encourage removal of debris and supply the increasing biofuel markets.
- The Emissions Trading Scheme to recognise debris with nil commercial value that are buried on site. Trapping of carbon in soils can be quantified and emission units received to help offset the cost of removing debris from the slope and burying them.
- Hauling more of the non-saleable logs and slash to the skid site and burning it.

RDNZ is strongly opposed to any recommendations of a move of production forests towards permanent forestry, select (non-clear fell) harvesting and harvest catchment restraints. Each of those strategies have dire consequences, including the destruction of statutory property rights.

The future of forestry needs to be supported here to retain investment in the subject regions. Production forestry is a major contributor to both GDP and employment in these regions and we as forest owners and managers are very aware of our social license to operate. You will be aware of many stories of forest companies helping the clean-up, some instances not remotely related to forestry, meanwhile we are yet to see a story of a farmer helping to remove the sedimentation deposited onto crops and homes.

RDNZ urges the Ministerial review to refrain from allowing the emotional element to supersede the economic, employment and environmental considerations of this matter. It is evident that the media and narrow voices can be powerful whilst ill informed. The New Zealand Government is responsible for seeing through emotional statements and to make decisions that protect the economic aspirations of the country whilst aligning to its policies and the policies that such forestry activities were implemented under.

History of the Land

For hundreds of years New Zealand underwent deforestation with much of this occurring in the 1800's and early 1900's, making way for what was thought to be productive farmland. For the Gisborne and Wairoa regions this was not always the case, with many highly erodible soils unable to withstand large precipitation events.

By the 1930's the Government was already embarking on a large-scale afforestation program under the State Forest Service to address issues of soil erosion and land degradation, and more recently in 1992, the Gisborne region established the 'Erosion Control Funding Programme' or 'ECFP', providing grants for production forestry to be established on erodible parts of farmland.

The ECFP never envisaged that these trees should be established on a permanent basis, in fact, the payments received under the ECFP were staggered as progress payments to make sure that trees established under the ECFP were appropriately tended (I.e., Thinned to a final crop stocking suitable for production harvest), implying that those trees should be harvested.

Volume of Water

The media and public opinion are quick to dismiss the severity of the weather events that are being endured, instead looking for the scapegoat. Any area of land or large catchment that receives +500mm of rainfall in a 24-hour period is going to have a high degree of sedimentation and debris mobilisation, if you then apply this rainfall to already water ladened soils, as we have seen, this delivers severe mid-slope failure.

Sedimentation

Afforestation of farmland was incentivised to help prevent mass erosion and sedimentation from farms into waterways which is then deposited onto other farmland, crops, and residential areas. As we have recently seen, this sedimentation is also responsible for damaging aquatic ecosystems such as the destruction of crustacean habitats near river mouths.

Sedimentation is driven mainly by precipitation, with geology and land use explaining much of the residual difference between sites. Studies by the Waikato District Council with reference to other independent reports, recommend that pasture slopes generate 2 to 5 times more sediment than comparable forestry slopes except for during harvest periods, however sediment loss, with good forest management is said to be restored to pre-harvest levels within one to two years.

While we are happy to support cost effective changes in the forestry sector that drive improved results, we are also acutely aware that this is a Land Use enquiry in the broader sense. We are confident when comparing farmland and forestry, that sedimentation arising from farmland has played a significant role in the damages resulting from Cyclone Gabrielle. Therefore, any result of this enquiry could not unjustly impact forestry without imposing consequences for sedimentation caused by farming.

Woody Debris & Harvest Slash

Woody debris can be defined as any dead, woody plant material, including logs, branches, standing dead trees, and root wads. Within the definition of woody debris are harvest residues, known as forestry slash.

Slash is a by-product of harvesting operations, ranging from the branches removed from logs to trees which don't meet commercial specs. Slash proves useful in returning nutrients to soils and assisting in providing cover for ground erosion, particularly in areas of highly erodible soil.

Woody debris left on stable ground present low risk of moving, however given the increasing effects of climate change and increasing likelihood of high-intensity rainfall events, managing debris such as harvest slash will continue to be an important topic in the forestry sector.

In large rainfall events, soil mobilisation, slope failure and rising water currents can all dislodge woody debris, moving them down slopes that lead to tributaries and rivers. The sheer volume of rainfall has dislodged Pine, Poplar, Regional Council Riparian plantings and native vegetation alike.

Land Use

It is important to consider the outcomes of different land uses when subject to extreme weather events such as January and February 2023. For the purpose of this, let's consider the three land uses below:

1) Farmland – Land solely used for farming has less root matter to bind the soil and allows water to quickly flow and carry high levels of sedimentation. The weight of sediment and speed of water would be expected to cause infrastructure washouts and high levels of sedimentation downstream.
2) Native Bush – Land solely in native bush will be able to sustain a level of rainfall by slowing movement, eventually mid-slope failure would happen, sedimentation levels would be low, but debris may include large trees that are likely to cause infrastructure washouts.
3) Harvesting Forests – The result would strike the middle ground as stumps help to bind the soils reducing sedimentation when compared with farmland, while smaller debris and logs may mobilise, causing infrastructure washouts.
4) Growing non harvested exotic forests (Radiata Pine). From the age of 3 or 4 years until harvest at 28 to 30 years a Radiata Pine production forest has showed many times in the past and again in Cyclone Gabrielle that there is little damage by way of washouts and off farm sedimentation. Photographs from Cyclone Gabrielle prove this, and our Sovereign Forest in the Wairoa area is a prime example. This forest is more than 20 years old and had a very low percentage of erosion during Cyclone Gabrielle, this is in contrast to the surrounding farmland which had massive slipping and slope movement resulting in huge volumes of sediment leaving the farms and entering waterways and damaging flood plains further down.

While the above analysis isn't scientifically proven for the purpose of this submission, it is plain to see that each land use has its own set of consequences. We must then include economic, employment and environmental considerations along with those results, to get the full picture.

Strongly Oppose - Permanent Forestry

Permanent forestry in the form of plantation (exotic) forestry or native forestry will ultimately have an undesirable set of consequences. If harsh rules were applied to foresters when managing their harvest, then the obvious choice would be for foresters to move away from production forestry to permanent carbon forestry, using the Emissions Trading Scheme to monetise additional stored carbon.

Permanent forestry will have a diminished benefit to the forest owner; however, it will have dire consequences both socially and environmentally. The harvest of forests would diminish in favour of low-cost forestry, diminishing employment and devaluing the land to zero or worse. Eventually those exotic trees will give way, becoming too heavy for the erodible soils, making it highly likely that much larger debris will mobilise.

Native permanent forestry is not feasible due to the very high costs of establishment and slow rate of carbon sequestration, such a mechanism to force native forestry without incentives or subsidies would drive foresters to relinquish land.

Strongly Oppose – Select (Non-Clear-Fell) Harvest

Select harvesting happens globally on land that is easy in contour allowing machinery to move through the forest or access stems from road carriages. The topography of land in the subject regions means that harvesting is almost always carried out via cable-based systems. Harvesting in these regions under cable-based systems is already hugely expensive and to work effectively, needs to allow for entire settings (faces) to be cleared. Any restriction to this activity would make the activity unsafe due to the confined zone of operation on erosion prone slopes requiring harvesting personnel to be present on the slopes. As well, forests opened up in strips allow for windthrow damage and potential mobilisation in forested areas alongside any strip harvesting. Any such restriction would not be feasible and would cause harvesting to cease in these areas, as well, such a restriction would slow the rate of harvest which removes the forester's ability to react to the commodity driven market.

Strongly Oppose – Catchment Restraints

Any maximum rate of harvest applied to any one catchment would considerably impede the forester's ability to optimise harvest age, act within financial covenants and react to financial markets, thus taking away fundamental property rights that go against freehold ownership of land. Any type of decision would drive large legal proceedings and seriously undermine confidence in freehold land rights and investment into forestry and other assets. Any catchment restraints would restrict forest owners' ability to harvest their forest in times when this is suitable weather (i.e., summer vs winter) or financial objectives. (i.e., a forest might be consented for only a part of the year where log prices are reduced).

Why Production Forestry

While the harvest process creates a short-term debris and sedimentation issue, the public have been very quick to dismiss the substantial environmental, social, and economic benefits of forestry, such as:

- Soil Conservation: Trees help to prevent soil erosion and maintain soil quality.
- Water Conservation: Forests help to regulate water flows and maintain water quality.
- Carbon Sequestration: Trees absorb and store carbon dioxide from the atmosphere, which helps to mitigate climate change.
- Biodiversity Conservation: Forests provide habitats for a wide range of plant and animal species, which helps to preserve biodiversity.
- Employment: Production forestry provides substantially more employment than comparative hill country farming operations. Forestry is said to employ one in four families in the Gisborne region, placing a huge importance of renewable and sustainable practices.

- Timber Production: Forests provide a renewable source of wood products, generating a perpetual supply of revenue through the rotational harvest of forests.
- Economic Contribution: Forestry is a significant primary sector, establishing large services sector expenditures and generating export receipts well in advance of comparative hill country farming.

Proposed Changes

While we are strongly against changes that only adhere to social drivers or that simply create further costs or barriers of entry in the form of consents, rates, or other inefficient taxations, we would be open to making pragmatic changes that further reduce or mitigate the likelihood of debris mobilising.

RDNZ suggests there are solutions that should be managed in conjunction with one another in order to achieve short term mitigation while incentivising programs and operations that form a solution while creating value. The movement toward biofuels and other fibre-based solutions coupled with the lack of pulp/woodchip processing facilities in the subject regions appears to present a real opportunity for the government to create positive solutions.

- Short Term Solutions:

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- Burning the non-saleable wood and debris on the skid sites immediately after harvest is completed.

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The first two of these solutions enhance the climate obligations of New Zealand, one through the circular economy and the use of renewable energy, and the other by the reduction of carbon being released to the atmosphere. At the same time, they remove some or all of the financial burden to extract the material from harvested slopes. The third solution is carbon neutral.

Roger Dickie NZ Ltd and the 21,600 hectares for forestry that we manage though the enquiry area, remain strong focused on delivering the best economic, environmental, and social outcomes for the region and are committed to continued improvement in these aspects.

We would welcome the opportunity to speak to our submissions and are happy to be contacted for further information as required.

Regards,

Roger Dickie, Will Dickie, Jeff Dickie,

Submission to the Ministerial inquiry into land uses associated with the mobilisation of wood debris.

Preamble

This submission is concerned solely with the management of logging woody debris, or rather, the potential for its elimination from a harvesting operation.

It addresses the terms of reference
12.3.7 Make recommendations to improve land use outcomes including preliminary advice as to:
12.3.7.1 changes needed to land use management including but not limited to, afforestation and harvesting practice.

While much of the mud covering the land after the most recent catastrophic climate events originated from farm land and some of the woody debris flowing down streams did not come from felling a plantation forest, this submission, by concentrating solely on logging woody debris, focuses on a single problem, avoiding dissipating the commission's energy.

I suggest that it should be possible to eliminate logging woody debris during harvesting from many steep-country plantations by changing operational practice, integrated with the processing and marketing of woody waste, most probably for bio-fuel.

I recommend that the Commission supports the establishment and funding of an integrated applied research project team to investigate how this should be done, answering the questions listed below.

Background

Logging Radiata pine generates woody material currently regarded as unmerchantable because the piece length is too short, the stem diameter too small or the quality unsuitable. The amount is some 15% (plus or minus) of the gross standing volume. Thus a 10 hectare logging setting with 600 m^3 per hectare recoverable (merchantable) volume will have upwards of 1000 tonnes of logging waste spread across the cutover or on the skids, see attached photographs.

When a pine tree is felled using a chain saw, it lands with a thump. The tree is often more than 40 m tall and weighs more than 2 tonnes. The stem usually breaks, on average at about two thirds of its length (with considerable individual tree variation, especially if the stem lands on a rock or another tree stump). Often the stem breaks into several pieces above the first breakpoint that are too costly to extract on steep terrain, i.e. are "unmerchantable".

It is possible to fell a tree to the ground without its stem breaking if a powerful enough felling machine (a feller-buncher) was used by a skilled, motivated operator.

Opportunity

Provided the correct technique were to be used with care, mechanised felling can prevent breakage and the non-merchantable part of the stem extracted, still attached to the main stem.

Provided correct stem merchandising were to be employed, once the merchantable logs have been made, the stem residues and the branch wood could be processed on site into some form of, or pre-cursor to, woody bio-fuel and transported away from the harvest area.

Provided processing and markets were optimised, the logging residues could be profitable.

It is recognised that the complete elimination across the whole of New Zealand of woody debris during harvesting is perhaps not feasible. Even so, the forest sector should aim high.

Discussion

New Zealand has been increasing the mechanisation of harvesting at a rapid pace. There are several highly innovative New Zealand engineering companies that manufacture logging equipment, ranging from the well-established felling/processing heads, to "winch-assist" systems for tethered feller-bunchers on steep land, through to remote controlled grapple carriages on haulers (cable systems, yarders)[1]. With these companies solving many of New Zealand's practical problems, if mechanised felling without stem breakage was carried out universally on steep country there would be no logging debris emanating directly from the standing trees.

The recent trend to a higher final crop stocking increases between-tree competition and mortality of the suppressed trees before harvest. Radiata is a vigorous competitor. The higher final stocking increases the risk that for the smaller trees the stem is less able to support itself and the crown (see Euler's law of columns). The tree stem and crown thus bend over and the tree is more susceptible to breakage during a storm, see photographs. Otherwise, if final crop stocking were to be kept below the level at which this and tree mortality occurs, harvesting occurs at a relatively young age with little down and dead debris prior to operations.

If the heavy-log component of logging slash were to be significantly reduced, then forest litter would not be much of a problem. Trees blown down years before harvest time would be partially rotted and have lost much of their weight and strength.

The best way to process both logs and waste at a skid site for their most economic transportation still requires some investigation. For example, should the waste material be chipped to its final form or should a variant of the Scandinavian "tree-section" method with minimal conversion before transportation be employed.

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[1] Ewers,D. 2019. From the ground up – transforming decades of harvesting experience into world-leading life-saving technology. *NZ Journal of Forestry* 63 (4): 13-16.
Raymond, K. 2018. PGP Steepland Harvesting – a collaborative research and development programme. *NZ Journal of Forestry* 63 (3): 18-21.

An integrated whole systems approach is needed, including investigation of marketing opportunities and waste processing facilities.

The devil is in the detail and the economics uncertain.

A research project team approach

I suggest that an applied research project is required utilising a project team approach, with success measured by the adoption of the results rather than scientific publications in international journals.

The project should answer the following.

1. What regimes should be avoided that result in mortality from between tree competition prior to harvest?
2. How can trees be felled on steep, broken terrain and extracted to roadside without any stem breakage?
3. What is the best roadside processing system to optimise the combined production of logs and waste, and their subsequent transportation?
4. What type and size of processing facilities of the waste are required and where should they be located to optimise returns, from which markets?
5. What are the economics of logging, processing and selling the former logging waste (i.e. how much profit can be made)?

Conclusion.

Production forestry is in real danger of losing its social licence to operate in many areas because of logging waste being washed downstream. That much of the mud covering the land after the most recent catastrophic climate events originated from farm land is irrelevant to forestry's licence.

The problem is solvable, with determination.

Dr C.J Goulding
Retired.
Formerly, Principal Scientist, Scion.
Forest Mensuration and Management Systems.
(Mensuration Project Team, 1976 – 1979)

027 9377110
chris.goulding@xtra.co.nz
Hamilton 3210, New Zealand.

The Mensuration Project Team was set up at the request of Andy Kirkland, at the time Director of Management, NZFS. Its operational manager was D.A. Elliott, transferred from Principal Forester, Silviculture, Kaingaroa. It was staffed 50:50 from operations management and the Forest Research Institute, with staff working full-time on the project, given a clear objective and a limited time-frame.

Photos courtesy of Dr B. Baillie, formerly, scientist, Scion.

Previously published 2018. New Zealand Journal of forestry 63 (2)

Nelder trial, 2009, Scion grounds, Rotorua.

Suggested reference material for the Panel

1960 and later, Reports by the previous East Coast and Hawkes Bay Catchment Boards on at-risk soils, especially reviews of the planting undertaken in Mangatu Forest from 1960 – – copy should be in National Archives

1970 Wise Land Use and Community Development – Report of the Technical Committee of Inquiry into Problems of the Poverty Bay – East Cape District of New Zealand (the "Taylor Report") – copy should be in National Archives

1978 Poverty Bay Catchment Board, Report of Land Use Planning and Development Study for Erosion-prone Land of the East Cape Region – – copy should be in National Archives

(no date) Logging Industry Research Association (LIRA) Logging Trials in Mangatu State Forest. – copy should be in National Archives

1992 – 2005 Reviews of the East Coast Forestry Project – there at least three completed over the span of the project – see MPI website

Images

Photo 1. Large eroding gully on Ihungia Station west of Te Puia prior to planting.

Photo2. The same area six years after planting. This illustrates clearly how quickly forest cover can be established and erosion contained.

Photo 3. Spot (release) spraying around newly planted *Pinus radiata* on Tauwhareparae Properties ex Port Gisborne Limited. Competition from grass for nutrients and water can inhibit young tree growth.

Photo 4. 3-4 year old Pinus radiata on eroding hill country in the Ohinepoutea Block (west of Ruatoria) owned by Ngati Porou Forests Limited.

Photo5. Douglas fir on higher altitude country at Te Rata Station west of Mangatu Forest

Photo 6. Steep inaccessible eroding valley on Bexhaven Station west of Tokomaru Bay. This area of regenerating manuka and shrub hardwoods has been approved for a reversion treatment under the project.

Photo7. Wide spaced Willow (*Salix sp*.) plantings. An alternative treatment where small gully erosion and slumping is occurring and where grazing is continuing as part of the land use.

Photo 8. Successfully established farm gully treatment on easier country in the Whangaroa area north of Gisborne

WAIMATĀ CATCHMENT GROUP

BACKGROUND

- 23,600HA OF MODERATE AND STEEP HILL COUNTRY
  - 46% SHEEP AND BEEF FARMS, SOME MULTIGENERATIONAL
  - 32% PRODUCTION FORESTRY
  - 11% NATIVE BUSH
  - 11% EXOTIC TREES, OPEN WATER, HORTICULTURE AND URBAN AREAS
- WAIMATĀ RIVER FLOWS 38KM INTO GISBORNE CITY AND IS THE MOST USED FRESHWATER RECREATIONAL ASSET
- HEAVILY SEDIMENTED, ERODING RIVERBANKS, HIGH E.COLI
- HUGELY IMPACTED BY FORESTRY HARVEST – LOGGING DEBRIS AND SEDIMENT ARE “THE GIFT THAT KEEPS ON GIVING”
- HOME TO SEVERAL MUD VOLCANOES

OUR CATCHMENT GROUP

- 50+ MEMBERS IN OUR CATCHMENT GROUP – FARMERS, SMALL BLOCK LANDOWNERS, FORESTRY COMPANIES, INDUSTRY REPRESENTATIVES
- REPRESENTING OVER 12,000HA OF THE CATCHMENT
- 8KM OF RIPARIAN AND WETLAND FENCING (25% Destroyed in Cyclone Gabrielle)
- ALMOST 20HA OF NATIVE BUSH AND RIPARIAN AREAS HAVE BEEN FENCED FROM LIVESTOCK (25% Destroyed in Cyclone Gabrielle)
- 60,000 NATIVES PLANTED (75% Destroyed in Cyclone Gabrielle), FURTHER 45,000 NATIVES TO BE PLANTED THIS WINTER
- PREDATOR CONTROL TRAPS FOR CATCHMENT GROUP MEMBERS TO PROTECT NATIVE PLANTING SITES AND BIRDLIFE
- 438 EROSION CONTROL TREES PLANTED, FURTHER 950 APPROVED FOR PLANTING THIS WINTER

BACKGROUND

THE GOOD

THE BAD

THE UGLY

BACKGROUND

The Waimatā Catchment is well known for its high land instability and erosion

Two landscape scale earthflows exist in the catchment as well as some gullying and very steep landslide prone land

The headwaters were planted in “protection forestry” after Cyclone Bola. Pine was used because it was fast growing – but it was not intended to be harvested.

These forests were subsequently sold by the government to Hikurangi Forest Farms – now Aratu – Wakaroa and Mangarara Forests.

Forestry has also been planted in the mid catchment – JNL Pukeakura, Forest Enterprises managed forests (numerous owners) and Aratu Waimanu Forest.

Hill country sheep and beef farms are the main other landuse in the catchment

The Waimatā River flows down through lifestyle blocks into Gisborne urban area

What happens in the Waimatā River ends up at the City bridges and on Waikanae and Midway Beaches

CLEARFELL FORESTRY IN STEEPLANDS

Forestry harvest started at Wakaroa and Mangarara forests in the 2010s. Other smaller forests on steep farmland were also been harvested over that time.

Hikurangi Forest Farms harvested Wakaroa Forest over the 2012-2015 period.

Following the 2018 storms HFF were prosecuted for their poor practice in the forest – where large scale landsliding, debris flow and landing failures were evident. There remains hundreds of thousands of tonnes of slash deposited on the slopes – or more often caught up in a birds nests in gullies.

This steeplands should never have been clearfelled – they were planted intended as protection forest – not commercial forestry. Bad decision making by central government has created this problem.

Every rain event slash is mobilised into debris flows that come down the streams destroying everything in their path and covering farms and roads with slash and sediment. The ecological values of the affected streams – and the Waimatā River have been destroyed. No stream can withstand the power of the force of slash and entrained debris that comes down.

The power of the slash scours the banks of the rivers, rips the riparian vegetation off the banks including the conservation trees planted to try and stablise the erosion

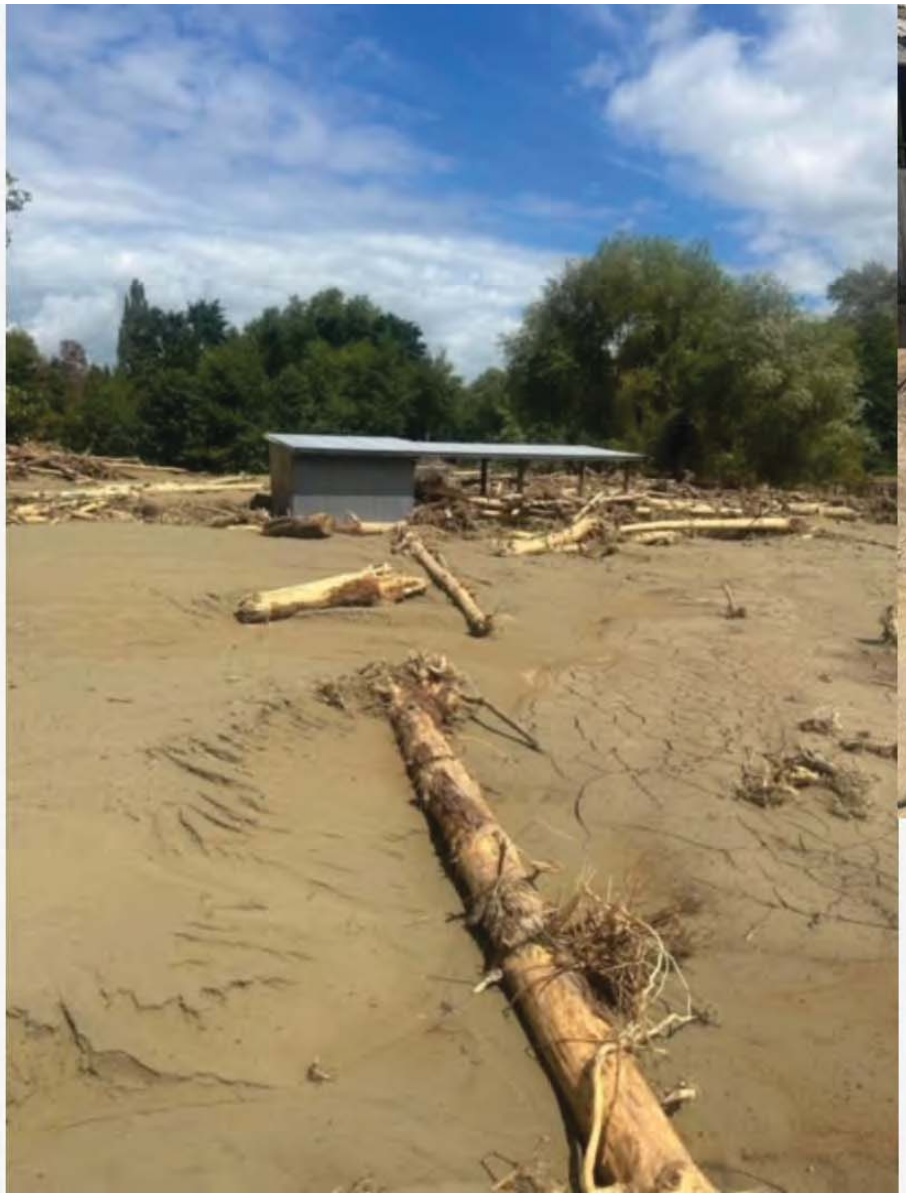
Wakaroa Forest is identified as ORANGE in the NES – PF ESC classification. **It is a Permitted Activity to clearfell this forest.** The effects of this **are not minor**, it is destroying our streams, our farms and the Waimatā River health. It has resulted in blockages of the bridges in the City, sedimentation of the estuary and Turanganui-a-Kiwa/Poverty Bay, loss of mahinga kai, debris across the City beaches and a devastating heartache to those of us who love the river – the most heavily used recreational waterbody in our region.

Event
Easter 2014 Wakaroa Farmland covered in slash, debris on Waikanae Beach Impacts on farmland in Waimatā River headwaters Significant sedimentation event Turanganui Estuary
September 2015 Waimatā River impacts, Mangataikehu Stream affected. Downstream farmland fences destroyed, riparian sediment and large amounts of slash deposits. Waikanae Beach covered in slash. Significant slash around William Pettie Bridge Gisborne City Significant sedimentation event Turanganui Estuary
11-12 June 2018 Waimatā River extensive slash damage to banks and bed Waimatā Valley Road culvert blocked, damage to road Mangataikehu Stream affected. Downstream destroyed, farmland covered in slash and sediment loaded and large amounts of slash deposits.
Cyclone Hale Jan 2023 Waimatā River extensive slash damage to banks and bed Waimatā Valley Road culvert blocked, damage to road Mangataikehu Stream affected. Downstream destroyed, farmland covered in slash and sediment loaded and large amounts of slash deposits.

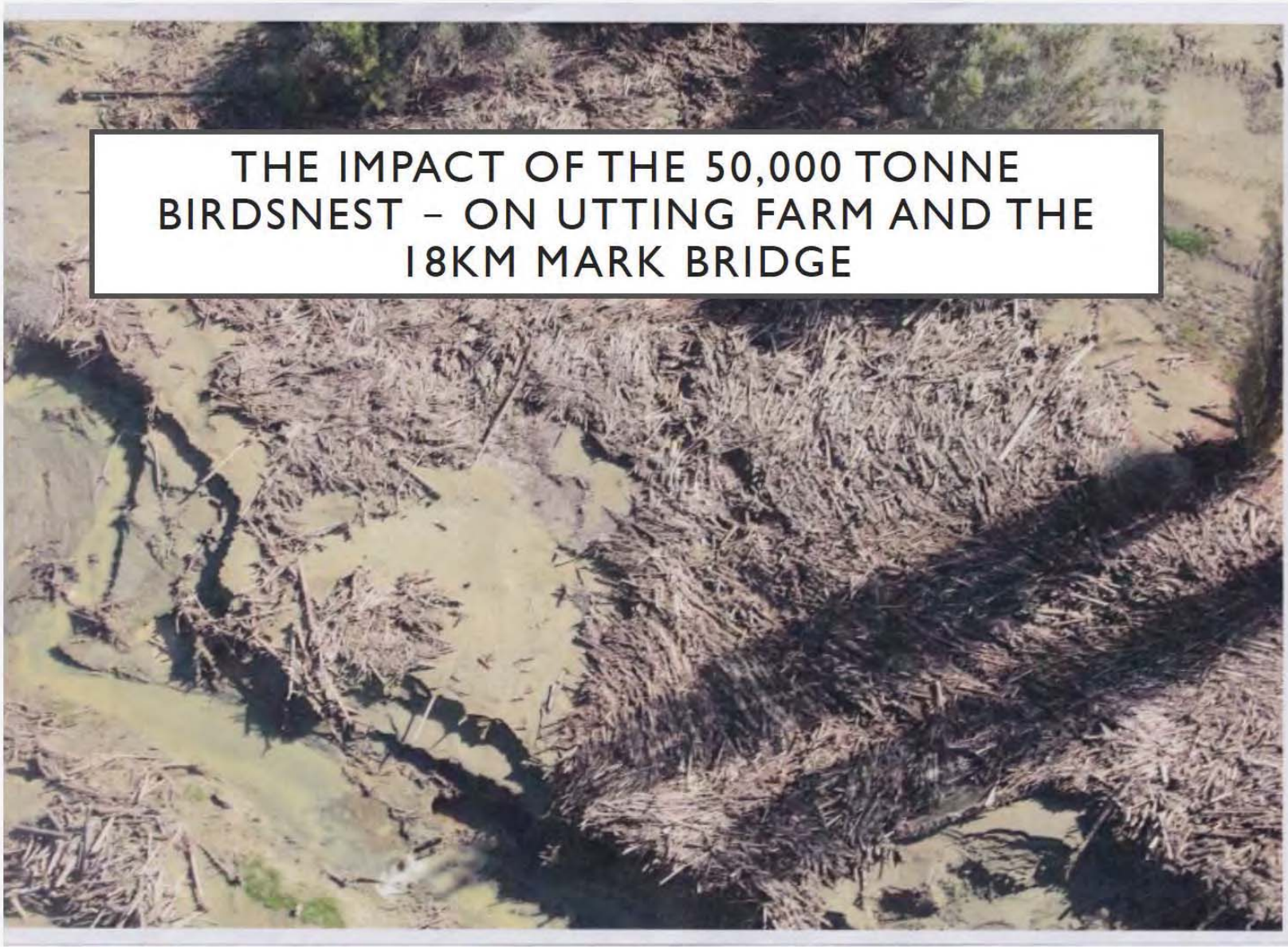
CYCLONE GABRIELLE

The piles of forestry slash and debris on Poverty Bay Beaches all comes from the Waimatā Catchment

KOBELCO



WAKAROA FOREST POST GABRIELLE


THE IMPACT OF THE 50,000 TONNE BIRDSNEST – ON UTTING FARM AND THE 18KM MARK BRIDGE

ECOWORKS ASSESSMENT

WR1 – Site one on the Waimatā River, around the 10km mark of Waimatā Valley Road. A large build-up of primarily pine debris is on the true left of the river.

WR2 – Site two on the Waimatā River, east of the 10km mark of the Waimatā Valley Road. Pine debris has been caught in kānuka and another *Pinus radiata* plantation on the true left bank of the river.

WR6 – Monowai Station, Waimatā tributary stream. Pine waste has mostly built up on the true left with some scattered on the true right.

WR9 – Waimatā River, downstream from 18km mark culvert – 2+ metres deep in slash.

WR7 – Monowai Station, confluence of tributary and Waimatā rivers. Debris piled up on island in between, extending out from a paddock inundated by silt.

WR8 – Waimatā Valley 18km culvert. Mainly on true left bank of main river channel, downstream a few metres (WR9) piles are on both banks are c.3 metres in height.

RECOMMENDATIONS

Forestry discharges to be regulated like other industries. Council to monitor and enforce. Costs falling to the landowners with the land use causing the discharge and penalties to those exceeding slash, sediment, phosphorus, etc limits

Govt to hold Gisborne District Council accountable to their responsibilities

Forestry environment plan required (including slash, sediment and nutrient management plans)

ETS to support transition to permanent native forest rather than plantation with ongoing management requirements

Govts former “Protection Forest” scheme to be reviewed: how many are no longer protected, what damage has their harvest caused to communities. Protection Forests to be actively restored and managed as permanent native forests at Govt’s cost

Collaboration with community to agree reparations

Funding for science to confirm long-term land use and restoration solutions

Expand poplar and willow pole availability

East Coast specific regulations for forestry

A review of costs associated with heavy traffic and logging debris on roading and infrastructure; and implementation of a system to result in a user-pays model

Significant change requires significant Govt investment

THE LEGACY

There are hundreds of thousands more tonnes of slash to come down from Wakaroa Forest

In Cyclone Gabrielle older trees – 12-15 year olds and even older have failed on the steeplands in Wakaroa and Managarara. The soil is too thin to take the weight of the trees when we have the heavy rains. Gravity does the rest.

Steeplands have also failed in farmland – and this has also generated vast quantities of sediment smothering ecosystems and covering farmland. But the forestry slash is what destroys the fences, the culverts, the bridges, scours the banks and beds of the river and covers the beach in debris.

The East Coast is not Kaingaroa Forest. We need to stop clearfelling steep eroding land. There are large amounts of land – forest and farmland that need to be supported back into native forest.

We need to have bespoke Rules for the forestry that remains that recognises the vulnerability of our district.

We have told government ministers and officials this so many times before.

Listen to Us.

Act NOW, not in 2 years or 5 or 10...

Stop pretending there isn't a problem.

SOCIALISED NEGATIVE EFFECTS OF FORESTRY

Wildfires

Every year, about 3000 wildfires burn through some 6000 hectares of New Zealand, costing us more than $100 million in damage to infrastructure and public property.

Air Pollution

New Zealand has 1.6 million hectares of pine plantation forest, which equates to 500 million kg of pollen each year discharged to air, to be dumped on us and our property.

Wilding Pines

More than a quarter of New Zealand is at risk of being smothered by wilding pines. Wilding pines overwhelm our native landscapes, killing native plants and forcing out native animals. that left unchecked, wildings would cost the economy $5.3 billion.

Worker Deaths

Across the forestry industry, over 50 workers have been killed since 2015. Based on fatality rates per 100,000 workers, forestry is the most dangerous at 56.73.

Truck Crashes

Logging truck accidents average two a week, most occurring in the Bay of Plenty and Waikato. Of 139 logging truck accidents in the past four years, 11 involved deaths and 31 people were injured.

Dangerous Trucks

Logging truck and trailer exemptions from traffic regulations putting at risk other road users. Logging trucks are allowed longer loads, no mudguards, and flying loose bark. No other industry is so exempt from traffic rules as forestry.

Road Damage

A five-year spend of nearly NZ$1.5 million on repairing roads damaged by logging trucks, a Taranaki council is looking to charge forestry owners. This is typical for roading authorities throughout NZ. Rates and taxes from the forestry industry clearly isn’t enough for their road damage, let alone for the raft (slash included) of other issues.

Slash

When there are storms and raised river levels, slash is a massive problem. Slash demolishes roads, bridges, farms, buildings, homes and vehicles. Slash is a marine hazard. Washed up pine slash on beaches is not natural and is a public danger to life. Slash is an environmental and economic disaster the public are left to deal with.

The Aftermath

Above: Sunday, 9 a.m. After Waikanae Beach had been practically cleared of debris ready for the holiday season, all the work was undone in 24 hours, and the beach was once again blanketed in a thick and tangled covering of driftwood.

News of approaching cyclonic weather and its potential impact on the East Coast always raises fears about what the fall-out will be for the forest industry. And so, it has come to pass yet again where the fully understandable emotion of the event, stoked by a media intent on sensationalism seems to take precedence over the pragmatism and science of just what has happened.

There is no disputing that forestry practices have contributed significantly to the devastation experienced by downstream communities, I have seen that with my own eyes as well as listened to the heart-breaking stories of families impacted. Ironically the root cause of these East Coast events has very little to do with forestry or the forestry sector. Land development initiatives in the late 19th/early/mid 20th century promoted by successive Government incentives where large catchments were cleared for pasture and a resultant booming agriculture economy in this region are the cause.

Widespread damage from floods over the Gisborne Plains has been reported on numerous occasions over the past 150 years of which only those of the past 60 odd years have occurred during any significant presence of pinus radiata forests. Widescale afforestation was implemented as a remedy to stabilise the catchments and seemingly assisted temporarily as is evidenced by historic photogrammetry contrasting damage on pastoral and exotic forested country e.g. following cyclone Bola.

You are probably wondering where I am going with this and I can't help wondering myself but the galling issue for foresters is that we, and only we, seem to take the brunt of the fallout and criticism and eventually we need to stand up and focus on the remedies, not tinker with the sticking plaster approach of just trying to mitigate effects. Forest companies must by now be grappling with the wisdom of investment decisions on much of the East Coast country affected by these storm events and having to continually bear the cost of the carnage that follows. At some point this cost will become untenable as appears to be occurring with the demise of neighbouring remote pastoral farming units because of marginal economics and viable farm succession.

My personal observations are that significant areas of the region now covered in radiata production forest are both unsuited to holding crops of heavy wooded vegetation, radiata and even native species if it were even possible to establish such cover, and eventual harvesting. Equally, strong arguments can be mounted for exclusion of pastoral farming from significant areas of currently farmed blocks I have seen that border these forests. The problem seems unsolvable and even locking up this country in perpetuity will come with a hefty price tag.

So, is it time to draw a line in the sand and investigate the option of an all-encompassing review of land use in these volatile catchments?

I have heard calls for commissions of enquiry and given Governments role over the years in encouraging land clearance and then afforestation, is this something that could only occur through a government led initiative? Maybe a diversion of TUR-NZFS funds and resources from a nice to have forest advisor registration scheme and establishment of a TUR-NZFS consultancy team, to get the ball rolling might be considered?

A long-term vision to take us through the next 100 years at least to deal with this issue seems a worthy objective. Although loathe to say this, I think it can only be achieved through Government leadership to engage with all affected landowners and support industries, probably on a catchment-by-catchment risk analysis and real focus on long term remedies. This must involve the science-based disciplines of geology, botany, ecology and others as well as agriculture and forestry sector specialists, an importantly consider the views and solutions for downstream communities.

I can envisage significant challenges around legislative instruments that currently manage land tenure issues such as property rights, CFL's, transition to Waitangi claim settlement provisions etc so any type of mechanism will require significant political, scientific and legal clout, maybe a bridge to far for the politicians and bureaucrats to get their head around at this juncture.

NZIF members will have their own views, but some sort of coordinated push initiated by NZIF could be a worthy objective.

NZ Institute of Forestry Newsletter 30 January 2023

Following on from my opinion in this forum a couple of weeks back, the fallout from cyclone Gabrielle has far exceeded my expectations of worst outcomes. This has been a major weather event that will cost this country $billions, it has cost lives, and the longer-term emotional toll on battered people cannot be overestimated or ignored.

Calls for commissions of enquiry into land use practices, as I understand it at the time of writing, have been vehement in some quarters. I for one understand that, but unfortunately political response, in a wide sense of the phrase, has been somewhat muted and muddling. Some of these calls alarmingly have been restricted to forestry practices and if we go down that pathway I fear for the future of our industry in a number of regions of New Zealand. Our industry cannot afford for that to happen as the outcome is likely to be very damaging. We are already back pedalling on such things as wider social licence and carbon. As a longer-term participant in our forestry sector I feel the pain and suffer the embarrassment of having to continually explain myself and I do have to work hard to stay calm and collected.

I am now strongly of the opinion that an independent, and that means apolitical, commission of enquiry is not only warranted, but essential. This must review land-use decisions of the past 100 years, acknowledge the failure of some of those decisions, and hopefully leave us with better knowledge to face the next 100 years. Practices and impacts on all land-use in these vulnerable regions is core, as well as catchment management, engineering infrastructure and community safety that must all be addressed. Outcomes of such a review will form the framework of a plan for future generations to adopt and adapt as necessary.

New Zealand has had commissions of enquiry following previous disasters such as Erebus and building standards after the Christchurch earthquake etc. I believe there may have been one of sorts into the Tangiwai disaster.

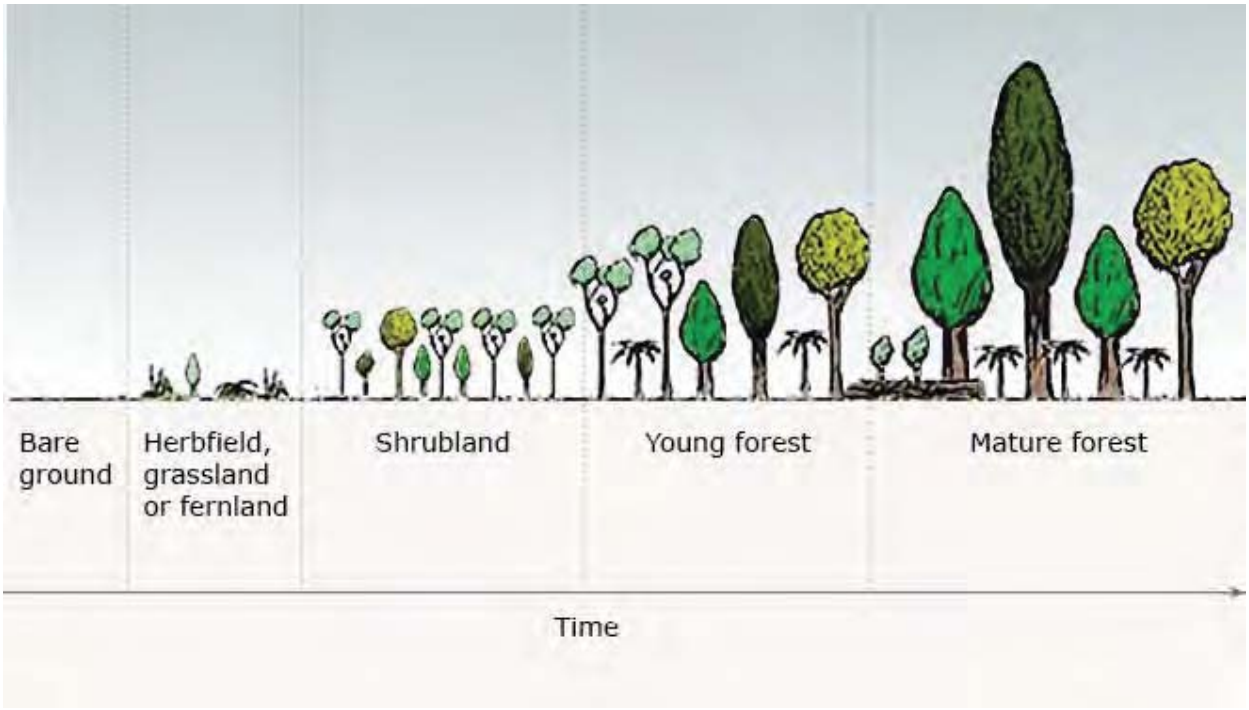
My question for the powers that be is to consider where these previous disasters rate in relation to what we have just seen with Gabrielle, that being an easy answer, get on with the job. That call seems even more straightforward when we consider the opinions of the climate change experts, that these events will only become more frequent.

NZ Institute of Forestry Newsletter 27 February 2023

Additional comment

All foresters are familiar with the cycles of reforestation, and this is critically important when considering the retirement of land from production uses.

https://teara.govt.nz/en/diagram/11898/stages-of-forest-succession



In New Zealand the herbfield/grassland or fernland stage is typically associated with noxious weed invasion. Typical response is to eliminate noxious weeds when in fact they are mostly valuable early colonisers. Examples of non-interference, exceptions being for animal and fire control, are common throughout New Zealand, particularly within protected native forests where cost of restoration e.g. ex-Cyclone Bola were prohibitive. Check-out historical imagery e.g. areas within Raukumaras. Another example is the Remutaka Range near Wellington where gorse has been used successfully as a nurse crop for native regeneration.

Big question – should we consider large scale seeding of colonising weeds such as gorse, broom, bracken even native species such as tutu to provide initial ground cover. Short term impacts of additional nitrification, downstream seeding effect might be outweighed by erosion mitigation effect.

Ministry for the Environment
Manatū Mō Te Taiao

Ministry for Primary Industries
Manatū Ahu Matua

National direction for plantation and exotic carbon afforestation

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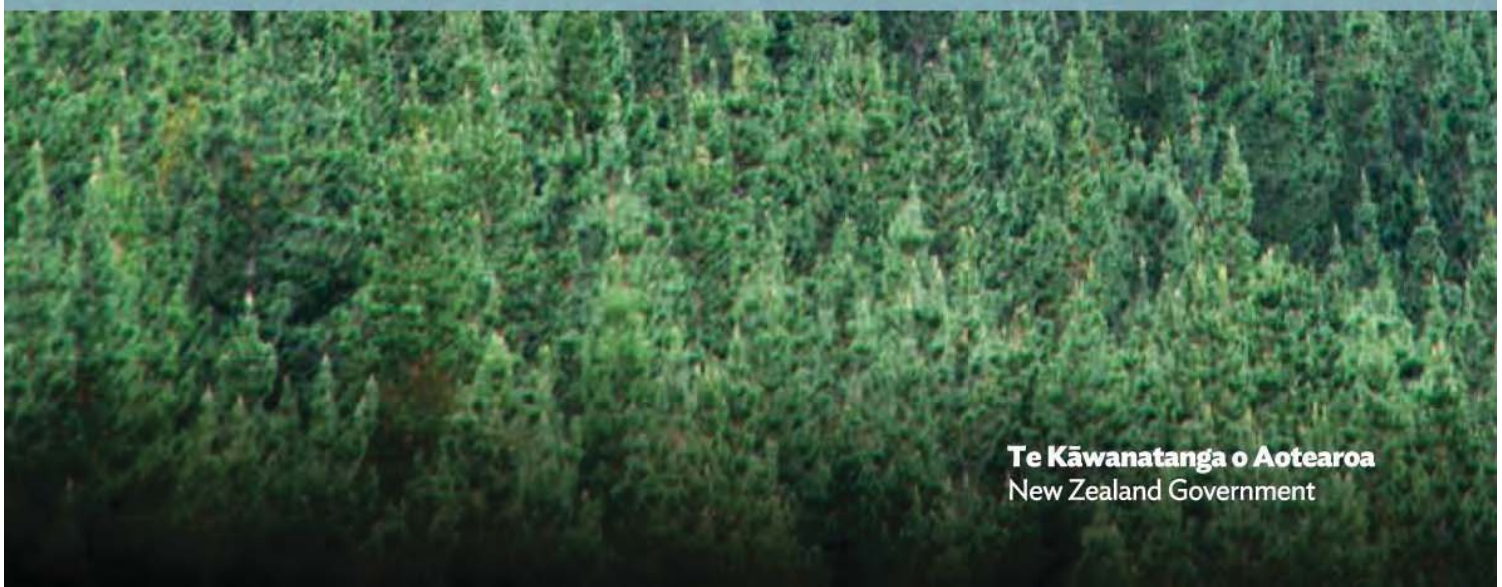

Te Kāwanatanga o Aotearoa
New Zealand Government

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www.mpi.govt.nz
0800 00 83 33
mpi.forestry@mpi.govt.nz

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MESSAGE FROM THE MINISTERS

The health of the land and our wellbeing go hand-in-hand. Our whenua is central to our identity in Aotearoa New Zealand. It is a place for us to live, make a living, and grow the food and fibre, timber and wool we need to survive. In te ao Māori, the health of animals, humans, and the environment is intimately connected. If the whenua is not healthy, every dimension of whānau wellbeing suffers.

Forests are not only central to our lives and livelihoods they are also essential to our climate change response; in 2020, forestry offset approximately 25 per cent of New Zealand's gross emissions.

While we recognise the multi-faceted value of forestry, there are increasing concerns about the growth and extent of exotic forestry and its environmental, economic, social, and cultural impact on communities. These include the conversion of whole farms to exotic forestry.

We are reviewing the National Environmental Standards for Plantation Forestry (NES-PF) to ensure the right forest is planted in the right place, and managed in the right way. This consultation forms part of a broader programme of work to ensure the long-term wellbeing of our forests and forestry sector.

Through this NES-PF consultation, we are proposing to give communities more say about local carbon farming, while making changes to improve how we manage wildfire risks and other environmental effects of exotic forestry. The consultation also seeks feedback on proposals to expand the scope of the NES-PF to include exotic carbon forests, to assess the location of exotic carbon forests and plantation forests, and to ensure the regulations remain fit-for-purpose. Through this consultation, we want to understand the impacts of these proposed changes on communities and on our whenua.

This consultation is especially relevant to rural communities and for Māori/iwi. Around 30% of New Zealand's 1.7 million hectares of plantation forestry is estimated to be on Māori land, and this is expected to grow to 40% as Treaty settlements are completed; Māori also make up around 40% of the forestry workforce. Hearing from our rural communities and Te Tiriti partners is an essential part of this engagement and the final policy recommendations to Government.

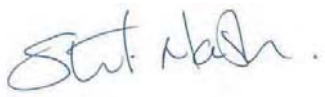
We have choices about how we grow the forestry sector to support its role in our transition to a prosperous low carbon society. We need to do so in a way that ensures our forests are managed to get the best outcomes for Aotearoa, our people and our environment.

Hon David Parker

Minister for the Environment

Hon Damien O'Connor

Minister of Agriculture



Hon Stuart Nash

Minister of Forestry

Hon Kieran McAnulty

Associate Minister of Local Government

Hon James Shaw

Minister of Climate Change

GUIDE TO THIS DISCUSSION DOCUMENT AND CONSULTATION

We want to know your thoughts on proposals affecting afforestation and the management of plantation and exotic carbon (permanent) forests.

Scope

This consultation focuses on the regulatory controls available under the Resource Management Act 1991 (**RMA**). The proposals largely involve changes to national direction made under the RMA: the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 (**NES-PF**). The consultation also touches on forest management covered under other legislation such as the Biosecurity Act 1993.

Out of scope of the consultation

The following types of forests and trees are **out of scope** and will not be affected by the proposals in this consultation (ie, they remain outside the scope of existing and proposed national direction at this time):

- indigenous natural forests, including harvest under Part 3A of the Forests Act 1949
- a shelter belt of forest species, where the tree crown cover has, or is likely to have, an average width of less than 30 metres
- forest species in urban areas
- nurseries and seed orchards
- trees grown for fruit or nuts
- long-term ecological restoration planting of forest species
- willows and poplars space-planted for soil conservation purposes.[1]

Forests, and forestry activities, are also controlled through other regulatory regimes and national direction. These are summarised in **Appendix A**.

We are consulting on four topics relating to afforestation and management of plantation and exotic carbon forests

You may choose to provide feedback on one, some, or all of these topics.

The options and proposals covered in this consultation are set out in four parts (Parts A-D):

Proposals to extend the scope of regulatory controls over afforestation and forestry management:

Part A: Managing the environmental effects of exotic carbon forests, including those with some level of harvest and/or those transitioning to indigenous forest.

Part B: Controlling the location of afforestation (plantation and exotic carbon) to manage social, cultural, and economic effects.

Part C: Improving wildfire risk management in all plantation and exotic carbon forests.

Proposals to update the NES-PF tools and regulatory controls over forest management

Part D: Addressing matters identified through the Year One Review of the NES-PF – to better enable foresters and councils to manage the environmental effects of forestry.

Your feedback on the options and proposals will inform our decisions on which of these to progress, how to develop them further, and how we might implement them.

Terms used in this document

The following are terms used in this discussion document. Some are defined in regulation, as indicated.

Carbon forest/forestry has a similar meaning to plantation forest as defined in the NES-PF, except that it is forest that will not be harvested below a certain level of canopy cover. This type of forest is sometimes referred to as 'permanent forest'.

[1] All of this list, with the exception of indigenous forests, is excluded from the NES-PF definition of plantation forests or forestry.

Exotic means non-indigenous species of trees.

Forest species is a tree species capable of reaching at least 5 metres in height at maturity where it is located (as defined in the Climate Change Response Act 2002).

Outstanding natural features and landscapes (ONFL) means natural features and landscapes that are identified in a regional policy statement, regional plan, or district plan as outstanding, however described, and are identified in the policy statement or plan by their location, including by a map, a schedule, or a description of the area (as defined in the NES-PF).

Plantation forest is deliberately established for commercial purposes, being at least 1 hectare of continuous forest cover of forest species that has been planted and has or will be harvested or replanted, and includes all associated forestry infrastructure[2] (as defined in the NES-PF).

Production forest has the same meaning as plantation forest.

Significant natural area (SNA) means an area of significant indigenous vegetation or significant habitat of indigenous fauna that is identified in a regional policy statement or a regional or district plan as significant, however described, and is identified in the policy statement or plan, including by a map, a schedule, or a description of the area or by using significance criteria (as defined in the NES-PF).

Transitional forest means a particular type of exotic carbon forest which is intended to be transitioned from predominantly exotic to predominantly indigenous species over time, while maintaining a minimum canopy cover.

Giving your feedback

Submissions on these proposals will be received by the Ministry for Primary Industries (MPI) through to 5:00 pm on 18 November 2022, by email to mpi.forestry@mpi.govt.nz or by post to Submission – National Direction for Exotic Afforestation, Forestry & Bioeconomy Policy Team, Ministry for Primary Industries, PO Box 2526, Wellington 6140.

More information on how to give us feedback is in the section on **Next Steps – How to have your say.**

[2] Forestry infrastructure means structures and facilities that are required for the operation of the forest, including forestry roads, forestry tracks, river crossings, landings, fire breaks, stormwater and sediment control structures, and water run-off controls (as defined in the NES-PF).

SUMMARY

Background to this consultation

National Direction under the Resource Management Act

The Resource Management Act 1991 (**RMA**) is the main piece of legislation that sets out how we should manage our environment. It is largely implemented by local authorities (regional councils, unitary authorities, territorial authorities (city and district councils)). Central government supports implementation using national direction tools – national policy statements (**NPS**), national environmental standards (**NES**), national planning standards (**NPS**), and regulations under section 360 of the RMA.

National Environmental Standards for Plantation Forestry manage environmental effects in plantations

The NES-PF are regulatory controls within the resource management system, that are used to manage the effects of plantation forestry on the environment.

The NES-PF regulatory controls are nationally consistent rules (technical standards, methods, and planning requirements) that also allow more stringent (stricter) local rules to be set by councils in their district and regional plans. These regulatory controls are used to:

- maintain or improve the environmental outcomes associated with plantation forestry activities; and
- increase the efficiency and certainty of managing plantation forestry activities.

Forest estate

The role of forestry in Aotearoa New Zealand and in primary sector production has evolved over time and continues to do so.

While the forest estate is characterised by a number of large-scale forests owned by a few big companies, about 30 percent is owned by smaller growers, often as part of a farming operation or as a syndicate. Both corporate and small-scale growers supply domestic processing and export markets.

Māori have substantial and wide-ranging interests in forests and forestry.

Exotic plantations were originally established to reduce pressure on Aotearoa New Zealand's indigenous estate, and to meet forecast growth in population and demand for construction materials. Our competitive advantages in plantation management have grown the forest sector into a significant primary sector export industry, that supports communities across the country, in forest management, processing and exporting.

Afforestation

Successive governments have encouraged the planting of new forests[3] (**afforestation**) to support improved environmental and economic outcomes for Aotearoa New Zealand over the decades.

Afforestation rates are increasing

The *Afforestation and Deforestation Intentions Survey, 2021*[4] reported that total afforestation in 2022 is intended to be 68,000 hectares, of which 5,000 hectares is indigenous species. Close to 1 million hectares could be planted between 2022 and 2050 – comprising around 70 percent exotic plantation forest, 20 percent permanent exotic (carbon forest), and 10 percent indigenous forest.

In addition, from 1 January 2023 people with exotic and indigenous forest that meet the requirements of the permanent post-1989 forest category will be able to register in the NZ ETS. Modelled scenarios[5] suggest that exotic forest afforestation could total around 2.8 million hectares over 2022–2050, with the majority managed as exotic carbon forests.

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[3] This includes schemes such as the *East Coast Forestry Project* (1993) to establish forests on erosion-prone land and the *Permanent Forest Sink Initiative* (2006) to contribute to our climate change targets.

[4] https://www.mpi.govt.nz/dmsdocument/52405-Afforestation-and-Deforestation-Intentions-Survey-2021

[5] Based on the 2021 Afforestation Economic Modelling report completed by the University of Canterbury's School of Forestry (Afforestation Economic Modelling (mpi.govt.nz).

Aotearoa New Zealand has had afforestation rates of this level before. Between 1970 and 2000, afforestation averaged 40,000 hectares a year. During the 1990s planting averaged over 40,000 hectares per year, the bulk of this incorporated into farms.

These forests helped create more resilient landscapes (standing forests provide excellent erosion control) and forests that are being harvested now are providing an income stream. However, the effects of land use changing to forestry can be significant for communities. In some areas, recent purchases of farmland for exotic afforestation, especially carbon forestry, have caused community concerns.

Opportunities from afforestation

The Government's goals for forestry[6] extend beyond plantation forests for timber and wood products, and indigenous forests for conservation and watershed management. Forests offer significant opportunities to:

- replace carbon-intensive steel and concrete with low carbon alternatives (eg, engineered wood products) and biofuels to replace fossil fuels.
- mitigate climate change through carbon sequestration (in both plantation and carbon forests).
- protect vulnerable land (eg, erosion-prone land).

To meet these goals, Aotearoa New Zealand needs more trees, including both plantation and exotic carbon forests, and to encourage the management of indigenous forests as long-term carbon sinks.

Challenges from afforestation

The increase in the rate of afforestation and its positive and adverse effects have highlighted potential weaknesses in the regulatory framework and councils' capacity and capability to manage the expected rate of change.

The current regulatory framework provides national standards for managing the environmental effects of plantation forestry through the NES-PF – which pre-dates the recent surge of interest in carbon forestry. In addition, few councils have decided to make rules to manage matters outside the scope of the NES-PF, including the environmental effects of other types of forestry, and social, cultural and economic effects. We understand this is due in part to constraints on council capacity.

Summary of proposals

Given these opportunities and challenges, we propose to extend the scope of the regulatory framework to include exotic carbon forests and to improve wildfire management, and to address matters identified through the Year One Review of the NES-PF to better enable foresters and councils to manage the environmental effects of forestry. We also seek feedback on options to support councils to control the location of afforestation (plantation and exotic carbon) to manage social, cultural, and economic effects.

The options and proposals are set out in four parts (Parts A-D), and the preferred options (except for Part B) are summarised below. More information about officials' analysis of the range of options to address the issues can be found in the Interim Regulatory Impact Statement.

Part	Preferred options and proposals (except for Part B)
Part A: Proposal to extend the scope of regulatory controls to manage the environmental (biophysical) effects of exotic carbon forests See questions A1 to A14	*Options 2 and 3 are preferred (option 1 is the status quo)* **Option 2: Amend the NES-PF to include a new forest category – 'exotic carbon forest'** **Option 3: Amend the NES-PF to require Forest Management Plans (FMP) for exotic carbon forests**
Part B: Options to extend the scope of regulatory controls to control the location of afforestation (plantation and exotic carbon) to manage social, cultural, and economic effects See questions B1 to B20	*There is no preferred option for Part B at this stage.* **Option 1: Local control – rules in district or regional plans** ▪ Clarify councils' ability to make rules for matters outside of scope of the NES-PF

[6] https://www.mpi.govt.nz/dmsdocument/44905-Future-of-Forestry

Part	Preferred options and proposals (except for Part B)
	• Add a new power to enable councils to make more stringent (or lenient) rules than established by the NES-PF • Provide guidance and support for councils to enable communities to determine appropriate locations for forests. **Option 2: National direction – consent requirement** Design and implement a new consent requirement – either by amending the NES-PF, developing a new National Environmental Standard (NES), or under the proposed new resource management legislation as part of the National Planning Framework (NPF).
Part C: Proposal to extend the scope of regulatory controls to improve wildfire risk management in all plantation and exotic carbon forests See questions C1 to C5	Amend the NES-PF to add a new requirement for forests over 1 hectare to have a Wildfire Risk Management Plans (**WRMP**) (Option 1)
Part D: Proposal to address matters identified through the Year One Review of the NES-PF to better enable foresters and councils to manage the environmental effects of forestry See questions D1 to D22	**Wilding risk management** Amend the NES-PF to increase the notification period for a wilding tree risk score, require submission of supporting information, and reflect updates to the Wilding Tree Risk Calculator and guidance; and Amend the NES-PF to add a new requirement for foresters to assess Wilding Tree Risk at replanting. **Slash management** Clarify that log-processing slash must be placed on stable ground Clarify that all slash placed on and around landing sites must be managed to avoid the collapse of slash piles Include a new requirement to manage slash on the cutover where there is a risk of it mobilising or causing slope failure **Initial alignment with NES-Freshwater** Make minor amendments to align some provisions of the NES-PF with the same provisions in the NES-Freshwater: • fish passage requirements • culvert inverts • the definition of sediment control • general conditions for use of vehicles, machinery, equipment, and materials **Operational and technical issues** Make minor amendments to address operational issues identified since the NES-PF came into force

BACKGROUND

1.1 Forestry in Aotearoa New Zealand is well established and brings many benefits

Aotearoa New Zealand's forests play a vital role in supporting and sustaining our natural, physical, economic, social and cultural wellbeing. New Zealand has about 10 million hectares of forest on a total land area of about 26 million hectares. The majority (about 80 per cent) of these forests are indigenous.[7] Exotic forests cover about 2.1 million hectares (8 per cent of the land area), with significant regional variation.

Over the last century Aotearoa New Zealand has developed a successful productive forest estate and industry. The commercial forest estate includes about 1.74 million hectares of plantation forests[8] dominated by exotic species, notably *Pinus radiata* at 90 per cent of the estate. About 40 per cent of commercial forests are owned by Māori.[9]

Exotic forests in 2018[10] and more recent conversions[11] are predominantly on Land Use Capability (LUC) classes 6 and 7, as shown in Figure 1.[12] LUC classes 6 and 7 comprise mainly hill and high country land. This land type is also widely used for sheep and beef farming (including strong and fine wool), particularly breeding and breeding/finishing farms, and deer. In parts of the country LUC 6 and 7 land is also used for dairying, orcharding and vineyards.

Figure 1: Exotic forest land cover across Land Use Capability (LUC) classes

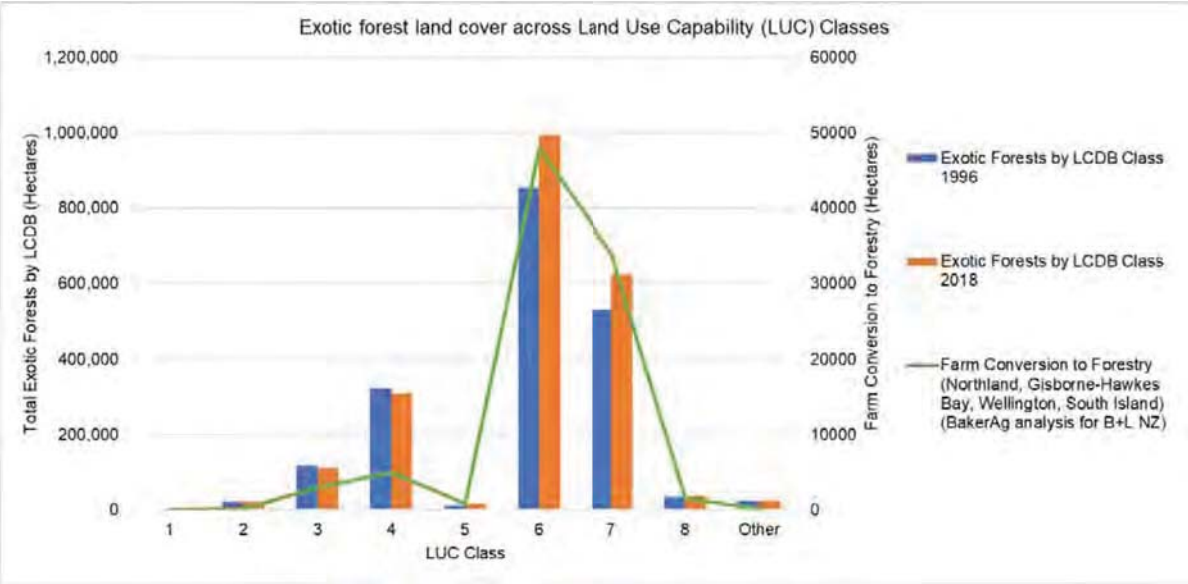

Figure 1 Legend
LCDB: Land Cover Database
LUC Class Descriptors
LUC Class 1: Suitable for a wide range of crops (0.7% of New Zealand's land area)
LUC Class 2: Suitable for many crops (4.5% of New Zealand's land area)
LUC Class 3: Restricted range of crops, intensity of cultivation is limited (9.2% of New Zealand's land area)
LUC Class 4: Occasional cropping but reduced range of crops and intensity of cultivation (10.5% of New Zealand's land area)
LUC Class 5: Non-arable, high producing (0.8% of New Zealand's land area)
LUC Class 6: Non-arable, suited to grazing, tree crops, & forestry (28.1% of New Zealand's land area)

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[7] https://www.mpi.govt.nz/forestry/new-zealand-forests-forest-industry/about-new-zealands-forests/#:~:text=Today%2C%20New%20Zealand%20has%20a,covering%2038%25%20of%20the%20land.
[8] National Exotic Forest Description 2021 (mpi.govt.nz)
[9]Ināia tonu nei: a low emissions future for Aotearoa » Climate Change Commission (climatecommission.govt.nz) (2021)
[10] LUC data has been calculated for exotic forest cover using the Land Cover Database (LCDB 2018) version 5.0 Exotic forest cover consists of the following LCDB classes: Deciduous Hardwoods, Exotic Forests, and Forest – Harvested.
[11] Independent validation of land-use change from pastoral farming to large-scale forestry. (BakerAg, July 2021) https://beeflambnz.com/sites/default/files/Potential-land-use-change-pasture-to-forest-species-report.pdf
[12] LUC descriptors are from Land Use Capability Survey Handbook, 3rd edition. Landcare Research. (2009).

LUC Class 7: Non-arable, with soil conservation measures suited to grazing and forestry in some cases (21.4% of New Zealand's land area)
LUC Class 8: Unsuitable for arable, pastoral or commercial forestry use (21.8% of New Zealand's land area)

The plantation forestry and wood processing industry contributes strongly to New Zealand's economic success. Wood products are now our fourth-largest export earner, generating an annual gross income of around $6.7 billion, 1.6% of our Gross Domestic Product (GDP). Over 35,000 people are employed in the sector. Like our indigenous forests, plantation forests also contribute to environmental, social, cultural, and economic outcomes.

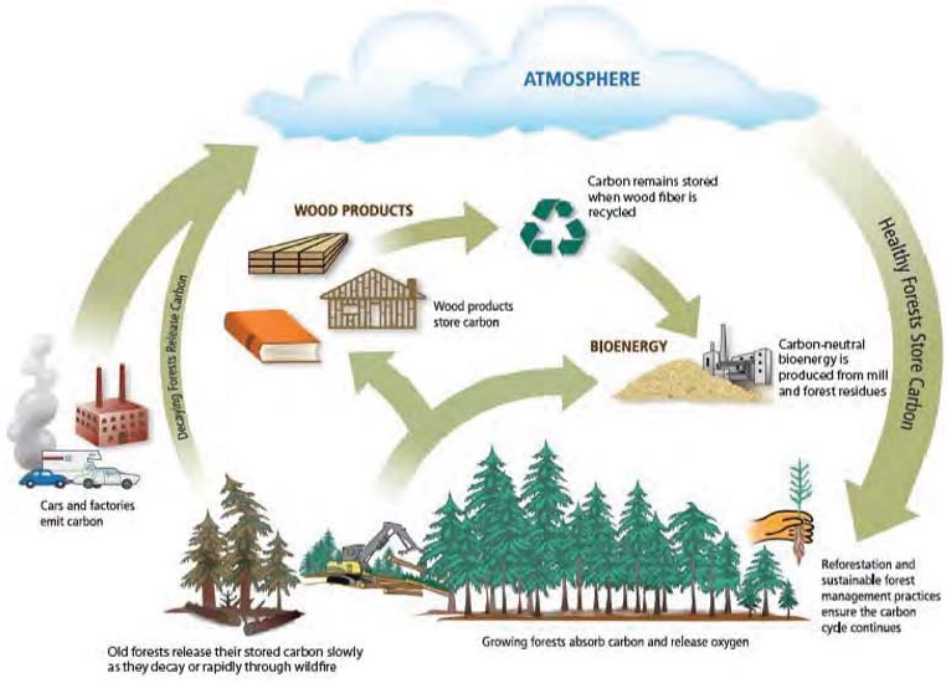
Looking forward, forests have a vital role to play as New Zealand transitions to a low-emissions economy. The Government's first Emissions Reduction Plan[13] establishes this vision for forestry:

> '*By 2050, Aotearoa New Zealand has a sustainable and diverse forest estate that provides a renewable resource to support our transition to a low-emissions economy. Forestry will contribute to global efforts to address climate change and emissions reductions beyond 2050, while building sustainable communities, resilient landscapes, and a legacy for future generations to thrive.*'

The Government is taking action to help the forestry and wood processing sector increase its potential – to offset emissions, replace high-emissions products with biomaterials and biofuels, enhance the natural environment by supporting biodiversity, improve water quality and stabilise erosion-prone land, and contribute to social and cultural wellbeing. A key initiative is the recently released draft Forestry and Wood Processing Industry Transformation Plan.[14]

Figure 2[15] (below) highlights the multiple values and uses of the forestry system for emissions reduction. These now extend well beyond the timber and wood products on which Aotearoa New Zealand's forestry sector was founded.

Figure 2: Sustainable Forestry Carbon Cycle



[13] https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf
[14] A draft of this plan was released for consultation on 19 August 2022. https://www.mpi.govt.nz/forestry/forest-industry-and-workforce/forestry-and-wood-processing-industry-transformation-plan/
[15] Sustainable forestry carbon cycle (Washington Forest Protection Association, 2020) adapted from California Forest Products Association materials. https://www.wfpa.org/news-resources/blog/washington-legislature-bills-recognize-working-forests-role-in-curbing-climate-change/attachment/sustainable-forestry-carbon-cycle/

1.2 Afforestation is expected to increase and new types of forest are emerging

Patterns of land use have changed dramatically over time and will continue to do so. The Ministry for the Environment's report, Our Land 2021[16] identifies climate change as one of the key factors driving change in land use. Other factors include intensification of agricultural land, population growth, consumer preferences, and domestic and overseas markets.

Among other changes, the area of land in forests, and especially exotic forests, is expected to increase in response to climate change and economic incentives (see 'Afforestation projections' below).

Patterns of afforestation

On a national scale, the amount of land required for afforestation to meet national objectives for emissions reductions is a small percentage of Aotearoa New Zealand's land area. However, the pattern of afforestation is unlikely to be evenly spread. Under current emissions prices and economic conditions the communities most likely to see more plantation and exotic carbon afforestation are those where the land is mainly hill country, with some mix of exotic forestry, indigenous vegetation, and sheep, beef, deer and wool.[17]

We are already seeing new types of forest emerge. These include exotic carbon forests planted to sequester and store carbon towards emissions reduction targets and not intended for harvest; and 'transitional' forests actively managed to transition from exotic to indigenous species over time. We are also starting to see shorter rotation exotic plantation forests to provide feedstock for the growing bioeconomy.

Exotic afforestation projections

The Ministry for Primary Industries' *Afforestation and Deforestation Intentions Survey*[18] (Survey, published in July 2022) was conducted in late 2021, when the carbon price was around $68 per NZU and also prior to the release of the discussion document on Managing exotic afforestation incentives.[19]

The Survey reported that total exotic afforestation is intended to be around 63,300 hectares in 2022, with 47,900 hectares confirmed at the time of the survey. Radiata pine makes up 94 per cent of these intended plantings, with around 10,200 hectares expected to be permanent exotic plantings. The report noted that intentions from 2023 to 2030 are much more uncertain than those in the near-term. Landowners are largely occupied with the current year and a range of factors influence intentions in later years. Future rates of afforestation will be influenced by a variety of factors, including NZ ETS policy settings.

Rising NZU prices can be a significant incentive to established exotic forests, particularly carbon forests. Scenario modelling[20] at higher carbon prices indicates the post-1989 exotic forest estate could total around 1.3 million hectares by 2030 (and 3.1 million hectares by 2050), with the majority of this exotic afforestation established after 2022 planted for carbon.

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[16] https://environment.govt.nz/publications/our-land-2021/

[17] Te Uru Rākau – New Zealand Forest Service estimates that up to 2.7 million hectares of low-productivity pastoral land may be suitable for new afforestation, of which around 1.5 million hectares could be suitable for production forestry, and 1.2 million hectares is suitable for new permanent forest due to steep and erosion-prone land (Te Uru Rākau – New Zealand Forest Service 'Private land potential suitable for afforestation' - r180017). These estimates are based on environmental suitability of land for forestry. They do not consider economic and logistical factors (eg, distance to port, landowner desire to shift land use to forestry).

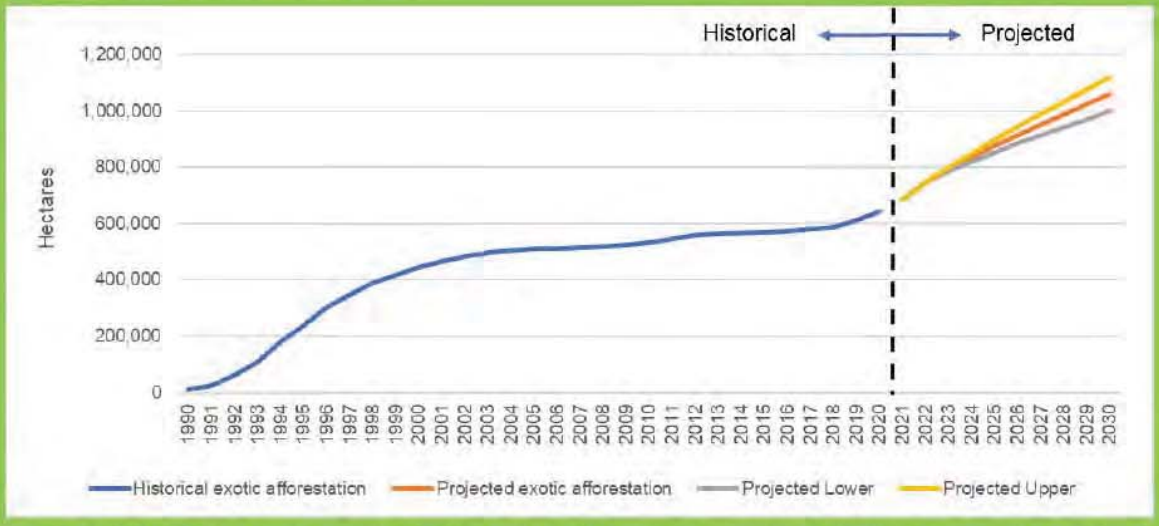
[18] https://www.mpi.govt.nz/dmsdocument/52405-Afforestation-and-Deforestation-Intentions-Survey-2021

[19] https://www.mpi.govt.nz/consultations/managing-exotic-afforestation-incentives. The Survey was carried out prior to the release of the discussion document Managing exotic afforestation incentives. The Survey does not therefore show the impact of the proposed changes to the permanent post-1989 forest category in the ETS. If changes to the permanent post-1989 forest category are progressed, actual afforestation rates may differ for the intentions reported in this Survey.

[20] Assumes returns for permanent exotic forests based on carbon prices equivalent to 2022 and 2026 NZ ETS cost containment reserve auction trigger price levels. Further technical information on the impact of carbon pricing on afforestation rates can be found in a separate report by the University of Canterbury, Afforestation Economic Modelling. Available at: www.mpi.govt.nz/dmsdocument/50302-Afforestation-Economic-Modelling-Report.

This figure below shows cumulative historical[21] and projected afforestation projections (based on the Survey). Three projection scenarios are provided.[22]

Figure 3: Exotic afforestation projections



Note: That in 1990 there was around 12,000 hectares of exotic afforestation, figures are cumulation from 1990.

- Centre line – shows baseline exotic afforestation projections of around 416,150 hectares between 2021 and 2030, comprising around 82 percent exotic plantation and 18 percent permanent exotic (carbon) forest.
- Upper and lower lines – represent "Upper" and "Lower" levels of exotic afforestation as reported in the Survey.

1.3 Growth in afforestation will have a range of effects, and bring opportunities and challenges

The expected growth in afforestation will have environmental, social, cultural and economic effects, and bring both opportunities and challenges for Māori, individuals, businesses and communities.

We recognise that indigenous and exotic forests provide important income and opportunities for Māori and other landowners eg, through integration into existing farm practices for profit, amenity, sustainability, and the environment.

However, we are also aware that the recent and projected increase in exotic afforestation, especially the emergence of exotic carbon forests on a significant scale, is raising concerns about adverse effects among some communities, primary sector interests, environmental non-governmental organisations (eNGOs) and councils. Those concerns span a range of environmental, social, cultural and economic issues.

The issue has become more urgent because the scale and type of interest in exotic afforestation has changed rapidly since the NZU price rose significantly in 2021.[23]

A separate consultation earlier this year sought feedback on managing exotic afforestation incentives through the New Zealand Emissions Trading Scheme (NZ ETS).[24]

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[21] Based on NZ's Greenhouse Gas Inventory Report, 1990 - 2020. https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2020/.

[22] These projections exclude the impact from newer initiatives outlined in the forestry chapter of the ERP, recent carbon market trends, and consultation on options for the permanent post-1989 forest category in the Emissions Trading Scheme.

[23] The fixed price option was removed in 2021, after which there was a sustained rise in the price of NZUs.

[24] https://www.mpi.govt.nz/consultations/managing-exotic-afforestation-incentives

Earlier feedback on exotic forests from the 2021 consultation on the Emissions Reduction Plan

Submitters highlighted the need to grow the right tree in the right place, at the right time.

Most submitters supported limits on different types of permanent exotic forest systems (e.g. *Pinus radiata* versus long-lived redwood species), their location or management. Main reasons for wanting limits included the risk of supplanting economically productive arable land and negative impacts associated with increased afforestation of exotics, such as fire risk and increased pests. Other reasons included improved biodiversity and that limits would mitigate impacts on rural communities from large-scale afforestation, which some submitters considered led to negative outcomes for rural livelihoods.

Submitters who opposed limits were concerned it would restrict the country's climate change ambition. They said permanent exotic (carbon) afforestation could help to bridge the gap on any emissions reductions shortfall.

Environmental effects of afforestation

Afforestation has positive and adverse effects on the environment that bring both opportunities and challenges. Table 1 sets out effects of afforestation and forestry on the natural and physical environment. Appendix C provides further information on how those effects may differ between plantation and exotic carbon forestry.

Table 1: Environmental effects of plantation and carbon forests and afforestation

Category of effect	Positive effect	Adverse effect
Biodiversity / ecological	• Regulating water supply and quality • Supports restoration/regeneration • Habitat for some indigenous species • Shade for aquatic biodiversity • Improving soil and air quality • Carbon storage	• Risk of wilding tree spread[25] • Habitat for pests, weeds and diseases • Reduced habitat for indigenous species at harvest • Increased erosion and sedimentation at harvest can reduce water quality and habitat • Decline in water yield
Natural hazards	• Reducing risk of erosion and landslip, particularly on erosion prone land • Managing flood flows	• Increasing risk of hazards during harvest, particularly under intense rainfall (accelerated erosion, mid-slope failure, mobilisation of forestry slash, debris from windthrow or mortality mobilisation) • Increased risk and impact of wildfires
Landscape	• Mixed forests may support indigenous forest restoration • Enhancing the appearance of the landscape	• Landscape effects on open rural landscapes (including significant, rural scenic, outstanding natural landscapes, outstanding natural character in the coastal environment). • Reverse sensitivity • Shading of roads and dwellings

[25] Wilding conifers are spreading at an estimated rate of 5% per year, despite control efforts https://www.doc.govt.nz/nature/pests-and-threats/weeds/common-weeds/wilding-conifers/ These are often the legacy of past government planting to control erosion. The intent of controls for planted forests is to ensure new forests do not exacerbate the wilding problem.

Social, cultural, and economic effects of afforestation

As with environmental effects, the social, cultural and economic effects of plantation and exotic carbon afforestation on local communities can be positive or adverse. Appendix D sets out our understanding of those effects.

The type of afforestation, the way it is managed, and its end use will be critical determinants of its social, cultural and economic effects. Other local factors will play a part, for example:

- the scale of the afforestation relative to other land uses
- which land is afforested, and the opportunity cost (if any) of the displaced activity
- whether post-farmgate or post-harvest processing facilities and support services are gained or lost
- timing effects and the extent to which forestry creates continuity of local supply and demand
- landowner aspirations, particularly Māori
- communities' sense of identity, and whether this is tied to any particular land use.

The characteristics of the community will also play a role. For example, a community with an established or growing forestry and wood processing industry may be well placed to benefit from an increase in plantation forestry, and the jobs and economic activity this generates – from site preparation and planting, through to harvesting and wood processing.

In contrast, a community centred on farming and meat or wool processing may be less able to benefit from afforestation if forest management expertise comes from outside the community and logs are processed elsewhere (within New Zealand or overseas). For such communities the adverse effects of land use change, for example reduced on-farm jobs and farm production, which could also affect the viability of local support services or processors of farm products, may outweigh the benefits of afforestation.

1.4 The current regulatory framework focuses on managing the environmental effects of plantation forests and forestry

The National Environmental Standards for Plantation Forestry 2017

The NES-PF was developed specifically to manage the environmental effects of plantation forests at the point of afforestation, through the forest life cycle and particularly at harvest. It was not intended to, and does not, cover forests that are not harvested, and pre-dates the significant interest in exotic carbon forestry.

The design of the NES-PF has a focus on managing the effects of clearfell harvest, which is the dominant harvest model in Aotearoa New Zealand, because other harvest models eg, low-intensity harvesting, usually have lesser environmental effects.

The policy objectives of the NES-PF are to:

- 'Maintain or improve the environmental outcomes associated with plantation forestry activities nationally; and
- Increase the efficiency and certainty in the management of plantation forestry activities under the RMA'.[26]

The provisions in the NES-PF are intended to achieve this policy objective through:

- Providing nationally consistent provisions (including specified permitted activity conditions) for the management of plantation forestry activities under the RMA.
- Establishing rules that permit plantation forestry activities where it is efficient and appropriate to do so, and where the activities will not have significant adverse effects on the natural environment.
- Requiring resource consent for activities where the environmental risk is higher and more site-specific oversight is needed, or where permitted activity conditions cannot be complied with.

[26] https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/

Afforestation for plantation forestry is a permitted activity in areas with lower erosion susceptibility, subject to conditions. Consent is required for afforestation of highly erodible (red zone)[27] land, within outstanding natural landscapes and significant natural areas and specified locally sensitive landscapes,[28] and where permitted activity conditions cannot be met.

Land use plan rules

Councils are able to make rules on land use that:

- are more stringent than the NES-PF in defined circumstances[29], where this is justified. Justification of a more stringent rule includes demonstrating that it is the most appropriate way to achieve the purpose of the RMA. The NES-PF Plan Alignment Guidance[30] has more detailed information on where plan rules may be more stringent than the NES-PF, and activities and effects that are not regulated under the NES-PF;
- manage any effects of plantation forests that are not covered by the NES-PF eg, forests that are not for harvest. Some councils have, or are developing, such rules, and one is removing rules.[31] To date, none have developed rules for managing social, cultural, or economic effects.

We understand that for some councils, capacity constraints, competing priorities for staff with the necessary expertise, and the time, cost and complexity of plan changes hinder the development of plan rules. Developing rules for managing social, cultural and economic effects would be particularly challenging at a local level for these reasons and due to a lack of clear enabling provisions to make these rules.

Regional and district plans continue to manage certain activities and effects related to plantation forestry that are not regulated under the NES-PF eg, pre-afforestation vegetation clearance, protection of cultural and historic heritage, and effects of logging trucks on public roads. In addition, regional and district rules established before the NES-PF came into force remain applicable to afforestation and forestry activities that are not for plantation forestry.

The Resource Management Act 1991

The RMA is New Zealand's principal environmental land use planning legislation. The purpose of the RMA[32] is to promote the sustainable management of natural and physical resources in a way that enables people and communities to provide for their social, economic and cultural wellbeing, while sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations.

People exercising functions and powers under the RMA in relation to managing the use, development, and protection of natural and physical resources are required to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

National Environmental Standards (NES) can prohibit or allow an activity, and prescribe technical standards and methods or requirements to regulate specific activities. NES can operate as plan rules to provide nationally consistent and clear resource consent requirements and standards for regulated activities. An NES generally prevails over plan rules, except where it expressly states that rules can be more stringent or lenient.

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[27] Red zone means the land mapped and classified with an erosion susceptibility rating of very high in the erosion susceptibility classification (ESC). http://www.mpi.govt.nz/growing-and-producing/forestry/overview/national-environmental-standards-for-plantation-forestry/erosion-susceptibility-classification/

[28] Regulation 6 of the NES-PF sets out the circumstances in which councils may make more stringent rules than the NES-PF rules. https://www.legislation.govt.nz/regulation/public/2017/0174/latest/DLM7373512.html. These include rules to give effect to the National Policy Statement for Freshwater Management, the New Zealand Coastal Policy Statement, and to protect unique and sensitive environments such as separation point granite soils, geothermal areas and karst geologies.

[29] Ibid

[30] For NES-PF Plan Alignment Guidance, and other NES-PF guides, see the MPI website https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/nes-pf-guidance/

[31] Marlborough District Council began developing rules ahead of the NES-PF coming into force in 2018. These have been updated to include forests for carbon sequestration. Waitaki and Waimakariri District Councils have recently released draft district plans, which define carbon forestry. These rules and proposals are to manage the environmental effects of predominantly permitted activity.

[32] Section 5 of the RMA 1991 as amended.

A NES may also prohibit or permit an activity, require resource consent for an activity, or place conditions on an activity. An NES can also state that consent may be granted subject to specified terms and conditions with the standard. The key feature of an NES is that it cannot include objectives and policies to guide discretionary decision-making. An NES applies as soon as it comes into force.

1.5 Policy objectives for managing exotic forestry and afforestation under the resource management system

Our aim is to achieve the Government's long-term vision for Aotearoa New Zealand's forests as set out in the Emissions Reduction Plan:

> By 2050, Aotearoa New Zealand has a sustainable and diverse forest estate that provides a renewable resource to support our transition to a low-emissions economy. Forestry will contribute to global efforts to address climate change and emissions reductions beyond 2050, while building sustainable communities, resilient landscapes, and a legacy for future generations to thrive.[33]

To support this aim, we want the resource management system settings to:

- ensure the environmental effects of all exotic afforestation and forestry activities are effectively managed in a nationally consistent way; and
- enable councils to control the location and scale of plantation and exotic carbon afforestation in communities, while ensuring national objectives for afforestation are met.

Responses to the 2021 consultation on Aotearoa New Zealand's first Emissions Reduction Plan and NZ ETS have helped to shape our thinking in developing the above objectives.

1.6 Resource management reform

Work is underway to reform the resource management system, by repealing the RMA and replacing it with three Acts:

- Natural and Built Environments Act (**NBA**) – to protect and restore the environment while better enabling development. It would be the primary replacement for the RMA.
- Spatial Planning Act (**SPA**) – to coordinate and integrate decisions made under relevant legislation by requiring the development of long-term regional spatial strategies.
- Climate Adaptation Act (**CAA**) – to address complex issues associated with managed retreat from climate change effects.

A proposed **National Planning Framework** (**NPF**) under the NBA would set out integrated strategic direction on the management of the environment, and consistent regulation. The NPF would be a single, comprehensive framework that will consolidate national direction. The intent of existing national direction prepared under the RMA will be preserved with updates necessary to ensure alignment with the new Act and reformed resource management system.

Under the proposed new system, national direction included in the NPF would be implemented through Regional Spatial Strategies (long-term spatial plans) made under the proposed Spatial Planning Act, and Natural and Built Environment Plans (property-level rules and direction).

You can find out more about RM reform at https://environment.govt.nz/what-government-is-doing/key-initiatives/resource-management-system-reform/overview/.

[33] https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/forestry/

2 **MĀORI** INTERESTS IN FORESTRY

Māori have significant interests in forests and forestry as land and forest owners, workers and business owners. Māori interests in forestry are extremely wide as forests represent a broad range of significance, including providing a home for ancestors and taonga, while also providing opportunities for financial gain, hunting and cultural activities.

In 2018, Māori were estimated to own $4.3 billion of forestry assets. In 2017, it was estimated Māori make up around 22% of the total forestry and wood-processing workforce (ie, around 8,480 people).[34] Around 30 per cent of New Zealand's 1.7 million hectares of plantation forestry is estimated to be on Māori land, and this is expected to grow to 40 per cent as Treaty settlements are completed.[35] A significant proportion of New Zealand's privately owned indigenous forest is on Māori-owned land.

Compared to the distribution of LUC classes nationally, a higher proportion of Māori land is less versatile land (ie, LUC 5-7) and a lower proportion is more versatile (ie, LUC 1-4). Around 71,000 hectares of Māori freehold land comprises remote and less versatile land, making it well suited to carbon or long rotation plantation forestry.[36] This implies that any regulatory changes concerning the matters in this discussion document could have a disproportionate effect on Māori, given that Māori freehold land and land that has been returned in Treaty settlements includes significant areas of existing forests.

The NES-PF is an instrument under the RMA, and therefore needs to be consistent with Part 2 of the RMA. Part 2 describes the purpose and principles of the Act, and states that people exercising functions under the RMA must:

- recognise and provide for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga (s 6(e))
- recognise and provide for the protection of protected customary rights (s 6(g))
- have particular regard to kaitiakitanga (s 7(a)), and
- take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) (s 8).

The NES-PF also needs to be consistent with relevant Treaty Settlement Acts and commitments made in settlement agreements.

Options and proposals under the RMA need to take into account the principles of the Treaty of Waitangi, post-settlement commitments, and Māori interests in forestry, including:

- significant interests in forestry, including indigenous forests
- that Māori freehold land has different characteristics to general title land, and is disproportionately on land considered marginal, steep or erosion-prone
- the strong Māori interest in afforestation
- the wider cultural, social, environmental and economic aspirations of Māori, including the ability of tangata whenua to make decisions about their own land.

[34] Forestry and Wood Processing Workforce Action Plan 2020-2024 (mpi.govt.nz)
[35] Crown Forestry Rental Trust (Ngaa Kaitiako Reeti Ngahere). Economics of Alternative Land use on Crown Forest Licensed Land. https://cfrt.org.nz/wp/wp-content/uploads/2018/05/EconomicsofAlternativeLandUseonCrownForestLicensedLand.pdf
[36] Based on the LUCAS NZ Land Use Map, analysis undertaken by Te Uru Rākau – Forestry New Zealand

3 PART A: MANAGING THE ENVIRONMENTAL (BIOPHYSICAL) EFFECTS OF EXOTIC CARBON FORESTRY

3.1 Problem statement

A lack of national direction to manage the environmental (biophysical) effects of exotic carbon forests and/or transitional forests, can cause inconsistent forestry management with poor environmental effects, e.g. where:

- exotic carbon forests have the same, or similar, effects to those of plantation forests but are not subject to the same standards
- the purpose and intent of a forest changes over time creating a regulatory gap e.g. when an exotic forest transitions to an indigenous forest
- there is uncertainty about future environmental issues that could arise over decades, as exotic carbon forests transition to indigenous forest and/or are grown to the end of their natural lifespan eg, long term stability.

Q A1 Do you agree with the problem statement set out above? Y/N Are there other things we should consider?

Existing and possible new regulatory controls over environmental effects

Some environmental effects that need to be managed to ensure a carbon forest is sustainable in perpetuity are covered under other legislation. For example, pests and weeds are managed under the Biosecurity Act, and wildfire under the Fire and Emergency New Zealand Act. Where an exotic forest is transitioning to indigenous species over time, there is also a potential crossover with the Forests Act, if any form of harvest is contemplated. The Forests Act sets the requirements for any harvest, milling or export of existing or regenerating indigenous forests on private land.[37]

Appendix C sets out the environmental effects of exotic forests at a high level. Table 2 sets out the environmental effects of plantation[38] and exotic carbon forests with existing regulatory controls. It also assesses what possible new controls should apply to exotic carbon forests. It does not include social, cultural and economic effects, which are covered in Part B of this discussion document.

Table 2: Environmental effects and regulatory controls for plantation and exotic carbon forests.

Environmental effect to manage	Existing regulatory controls		Potential controls to manage the environmental effects of exotic carbon forests
	Plantation forests for harvest	Exotic carbon forests	
Locational effects (afforestation)			
Outstanding natural landscapes and features	Restricted discretionary activity in the NES-PF	District plan rules	Current NES-PF rules should apply to all afforestation
Visual amenity landscapes	Controlled activity if rules in a plan restrict plantation forestry activities within that landscape.	District plan rules	Current NES-PF rules should apply to all afforestation

[37] See Part 3A of the Forest Act 1949 https://www.legislation.govt.nz/act/public/1949/0019/latest/DLM255626.html

[38] The NES-PF does not distinguish between species. It covers any forest that fits the definition, which can include indigenous species. New Zealand has a small number of indigenous plantation forests that grow trees for timber and manage them in a similar way to plantations of exotic species.

Environmental effect to manage	Existing regulatory controls		Potential controls to manage the environmental effects of exotic carbon forests
	Plantation forests for harvest	Exotic carbon forests	
Vegetation clearance pre-afforestation	Regional or district plan rules	Regional or district plan rules	Current NES-PF rules should apply to all afforestation.
Significant natural areas	Restricted discretionary activity in the NES-PF	District plan rules for SNAs	Current NES-PF rules should apply to all afforestation
Shading of roads and dwellings	Setbacks in the NES-PF; Transport Act	District plan rules; Transport Act	Current NES-PF rules should apply to all afforestation
Risk of wilding tree spread	Permitted activity if low risk in the NES-PF; Restricted Discretionary activity if high risk; Regional pest management plans (RPMPs) apply outside plantation.	District plan rules apply for planting wilding risk species; Regional pest management plans	Current NES-PF rules should apply to all afforestation, though stronger species-specific rules may need to apply. *Spread risk may be greater for carbon forests where trees will attain their greatest height, and therefore maximum dispersal potential,[39] over longer periods than plantation forests.*
Water bodies	Setbacks, water quality standards and management rules in the NES-PF; councils can apply more stringent rules as required	National Policy Statement for Freshwater Management (NPS-FM), Regional Policy Statements and Regional Plans	Current NES-PF rules should apply to all afforestation *Trees provide beneficial shading and bank stability for water bodies. Setbacks for harvested forests are intended to enable permanent cover to develop, and to keep machines away from waterways.* *Carbon forests may not be harvested but given potential for changed circumstances, setbacks from waterbodies must be mandatory.*
Risk of mass movement erosion	Restricted discretionary activity on red zone land in the NES-PF	Regional plans	Current NES-PF rules should apply to all afforestation *The risk of mass movement erosion is highest on red zone land. Such land generally benefits from permanent forest cover to reduce shallow mass movement erosion risk. Councils should have sufficient discretion to manage all environmental effects of carbon forests, including species, locational effects and potential harvest effects in the event of any harvest activities. Regulation 17(4)(a) of the NES-PF already enables discretion over erosion and sedimentation effects, including effects on ecosystems, fresh water, and the coastal environment.* *Where permanent exotic cover is a demonstrable erosion risk, councils may require transition to indigenous cover as a condition of consent.*

[39] 'Dispersal potential rather than risk assessment scores predict the spread rate of non-native pines across New Zealand,' Wyse and Hulme 2021, *Journal of Applied Ecology*

Environmental effect to manage	Existing regulatory controls		Potential controls to manage the environmental effects of exotic carbon forests
	Plantation forests for harvest	Exotic carbon forests	
Cumulative impacts on surrounding community	Not managed by the NES-PF	Not managed	New regulatory controls could include consideration of potential risks associated with transition of exotic to indigenous forests and exotic forests reaching the end of their natural lifespans. This could include mobilisation of debris from windthrow or mortality. *Cumulative impacts depend on catchment, district and regional effects, and on how forests are managed over time. For example, forests can provide significant erosion control that benefits downstream communities but may cause increased sediment following harvest if not well managed. Additional forests may have a positive impact where wood-processing industries are nearby or may reduce the demand for essential agricultural services where land use is mainly agricultural.*
Management effects over the life cycle of the forest			
Risk of wilding tree spread	Requirement in the NES-PF to remove wildings from wetlands and SNAs on the same property. Regional pest management plans apply to all landowners with regionally variable requirements.	Regional pest management plans apply to all landowners with regionally variable requirements.	Current NES-PF rules should apply to all forests covered by the NES-PF *Exotic carbon forests will require ongoing boundary surveillance under the Biosecurity Act (RPMPs) to enable appropriate management of any spread.*
Risk of mass movement erosion	Harvest is a controlled activity on red zone land other than class 8e; harvest on class 8e land is a restricted discretionary activity in the NES-PF.	Regional plans	Harvest rules should apply to all forests covered by the NES-PF. *Harvest increases erosion risk during the window of vulnerability*[40].
Water bodies	Setbacks, management rules and water quality standards under the NES-PF; councils can apply more stringent rules under the NPS-FM	NPS-FM and regional water plans	Current NES-PF rules should apply to all forests.
Water yield	National Policy Statement for	National Policy Statement for	Current NES-PF rules should apply to all forests

[40] The window of vulnerability describes the elevated risk of landslides after a forest has been harvested and before the next crop reaches canopy closure and root site occupancy. The window is about 5-6 years but depends on factors such as stocking density, interval between harvesting and replanting, geology, slope and terrain.

Environmental effect to manage	Existing regulatory controls		Potential controls to manage the environmental effects of exotic carbon forests
	Plantation forests for harvest	Exotic carbon forests	
	Freshwater Management (NPS-FM), Regional Policy Statements and Regional Plans	Freshwater Management (NPS-FM), Regional Policy Statements and Regional Plans	*All forests (exotic and indigenous) have an impact on water yields.*
Significant natural areas	Activity rules in setbacks under the NES-PF; more stringent rules in plans	Vegetation clearance rules; rules in plans	Current NES-PF rules should apply to all forests.
Water quality and sedimentation	Water quality standards, and performance requirements for all activities	Plan rules (including to give effect to the NPS-FM)	Current NES-PF rules should apply to all forests, in particular those for earthworks, harvest[41] or river crossings. *Earthworks and harvest are the key risks for water quality..*
Indigenous birds	Requirements to protect nests of threatened species; Wildlife Act	Wildlife Act	Current NES-PF rules should apply to all forests *Harvesting presents key risks to fauna.*
Fish species	Fish Spawning Indicator for presence; sediment standards; fish passage required for river crossings. Freshwater Fisheries Regulations 1983	Regional Plan rules and NES-Freshwater requirements for fish passage. Freshwater Fisheries Regulations 1983	Current NES-PF rules should apply to all forests *River crossings and harvest are key risks for aquatic species.*
Other indigenous species	Wildlife Act	Wildlife Act	*Harvesting presents key risks to fauna.*
Forest diseases	Government Industry Agreement between MPI and New Zealand Forest Owners Association (NZFOA); Forestry National Surveillance Plan	General Biosecurity Act provisions	Exotic carbon forests should be subject to the same biosecurity requirements as plantation forests. *All forests are subject to disease, though risk is largely species-specific.*
Wildfire	Service Level Agreements between FENZ and most large forestry companies for Forest Fire Risk Management Plans; no particular	Unknown	Any new NES-PF rules should apply to all forests covered by the NES-PFExotic carbon forests should be subject to the same Service Level Agreements with FENZ as plantation forests, as this is the main planning requirement for wildfire.

[41] The ETS enables harvest as long as 30% canopy cover is maintained. This means that harvest operations may be common in forests planted as permanent forests under the ETS.

Environmental effect to manage	Existing regulatory controls		Potential controls to manage the environmental effects of exotic carbon forests
	Plantation forests for harvest	Exotic carbon forests	
	requirements of this nature for smaller companies/forests		Exotic carbon forests should be subject to the same Service Level Agreements with FENZ as plantation forests, as this is the main planning requirement for wildfire. Any new NES-PF rules should apply to all forests covered by the NES-PF. Exotic carbon forests should be subject to the same Service Level Agreements with FENZ as plantation forests, as this is the main planning requirement for wildfire. Exotic carbon forests should be subject to the same Service Level Agreements with FENZ as plantation forests, as this is the main planning requirement for wildfire. *All forests are subject to wildfire risk and damage. Carbon forests may have higher wildfire risk if they are not managed for ladder fuels, debris and access.*

Q A2 Have we accurately described the environmental effects of exotic carbon forests (Table 2)? Y/N What other environmental effects (if any) need to be managed that are different to those of plantation forests? Please provide evidence on the impact of these effects.

Q A3 Do you agree that the environmental effects of exotic carbon forests should be managed through the NES-PF? Y/N Why?

Q A4 The right-hand column of Table 2 sets out possible new regulatory controls. Please indicate if you disagree with any of these potential controls or feel we have missed anything, and explain or provide evidence.

3.2 Options to regulate exotic carbon forests

Councils are responsible for compliance, monitoring and enforcement of national environmental standards. If exotic carbon forests were regulated, then councils would be required to manage exotic carbon forests in perpetuity. A number of councils could build on the experience of managing their own forests and reserves, but we understand that few councils have experience with compliance.

Central government tools and information would be required to support councils with implementation of regulatory controls for exotic carbon forests, including advice on resource consent conditions and management plans, and expertise in monitoring and compliance.

We have identified three options for regulating exotic carbon forests. For each of these options the term *'exotic carbon forest'* (or an alternative term) will need to be defined.

Options 2 and 3 are preferred.

Option 1: Status quo - councils retain power to make objectives, policies and rules to manage exotic carbon forests

Councils are already empowered to make objectives, policies and rules for exotic carbon forests. This is because forests that will not be harvested are not regulated by the NES-PF.

Pros

This provides councils with the greatest flexibility.

Maintaining the status quo would allow councils to retain full decision-making power over these forests, and tailor their regulations to their broader community and environmental needs. To remove ambiguity, this could be done through an advice note or an explicit provision in Regulation 5 of the NES-PF, which sets out the application of the regulations.

Cons

We understand that some councils have limited capacity and technical capability in forestry issues, and are likely to need external advice on appropriate forest management eg, the permanent forest category of the NZ ETS allows harvest down to 30 per cent canopy cover.

Depending on how councils define exotic carbon forests and the rules they set, it might not always be clear whether the NES-PF or the council regulatory regime applies. This would add complexity and uncertainty for all parties.

Changes to council plans can be time-consuming and costly, and legal challenges to proposed plan changes increase the risk of delays and higher costs.

To enable councils to make informed decisions about changing RMA plans, we would develop advice and guidance on the environmental benefits and adverse effects of carbon exotic forests, across a range of commonly planted species.

Option 2: Amend the NES-PF to include exotic carbon forests

Option two would amend the NES-PF to apply the existing regulatory controls for plantation forests to exotic carbon forests. Some minor variations may be required. This could be achieved by:

- adding a new definition for exotic carbon forestry or amending the current definition of plantation forestry
- applying general provisions to both plantation and exotic carbon forests, and specific provisions to exotic carbon forests as required
- introducing a new matter of discretion to regulation 17, which would enable councils to consider wind effects on forest stability for all forests greater than 2 hectares on red zone land.

We are interested in feedback on risks of exotic carbon forests that may be different to plantation forests. Table 2 sets out the current effects managed by the NES-PF and how these could apply to exotic carbon forests. Additional effects may need to be managed depending on the forest management model used, eg, mortality mobilisation from light wells in exotic forests transitioning to indigenous forests, and the management of exotic forests to the end of their natural lifespans.

Pros

The environmental effects for all exotic forestry (and indigenous plantation forestry) would be incorporated in one set of regulations, and would use many of the existing regulations, particularly afforestation provisions in Subpart 1 of the NES-PF.

Subject to decisions on changes to regulatory controls in the NES-PF, the assessment of wilding tree spread risk from exotic carbon forests could be considered as part of the Wilding Tree Risk Calculator updates (**Part D** refers).

Although the NES-PF was designed to focus on anticipating and managing a forest at harvest, this means exotic carbon forests in the NES-PF would be required to comply with all afforestation provisions, which have been designed with harvest in mind. However, these provide protections where harvest is part of an exotic carbon forest lifecycle and where related activities are carried out (e.g. pruning and thinning, development of river crossings, and harvest activities (including partial forest harvest under Regulation 63). The activity-based regulations should carry no burden for exotic carbon forests where they are not undertaken.

Cons

The NES-PF was designed to focus on anticipating and managing a forest at harvest. It did not consider any additional effects of a forest standing over a long period and/or transitioning to a different species. There may be specific effects that should be considered and managed through regulation.

The regulations do not include requirements for managing a forest, so cannot currently require certain activities in relation to the longevity or composition of the forest e.g. cutting lightwells in the forest to enable regeneration, or requiring assessment of an existing native seed source.

The Climate Change Response Act requires participants in the ETS to comply with the RMA at registration, but compliance with RMA requirements is not monitored as an ongoing condition of NZ ETS registration.

Q A5 Do you agree with option 2 for managing the environmental effects of exotic carbon forestry (amend the NES-PF to include exotic carbon forests)? Y/N Why?

Q A6 Do you agree that a National Environmental Standard should manage [choose one]: (a) the environmental effects of exotic carbon forests only? Y/N or (b) environmental effects and forest outcomes, including transitioning from predominantly exotic to predominantly indigenous species? Y/N Why?

Q A7 Do you agree with the proposal in option 2 (amend the NES-PF to include exotic carbon forests) to add wind effects as a matter of discretion to Regulation 17, to manage potential instability as a result of wind for all forests on red zone land? Y/N What benefits or drawbacks would there be from adding wind effects?

Q A8 How effective would option 2 (amend the NES-PF to include exotic carbon forests) be in managing the environmental effects of exotic carbon forestry? [select from a range/scale not effective – highly effective] Why?

Q A9 What implementation support would be needed for option 2 (amend the NES-PF to include exotic carbon forests)?

Option 3 – Amend the NES-PF to require Forest Management Plans for exotic carbon forests

A Forest Management Plan sets out the goals for the forest and how those goals would be achieved eg, composition and location of stock, planting, and forest risk management such as pest control.

The NES-PF requires management plans as a condition of permitted activities for earthworks and quarrying over a certain volume, and for all harvest activities. These plans are attached to specific activities, which are time and effects bound, rather than applying to the whole forest cycle.

Forest management plans that cover the life of the forest rather than specific activities could be required as a condition of resource consent but would be more difficult to justify for activities that are permitted. Permitted activities should avoid becoming subject to the fulfilment of resource-consent type conditions and should not be dependent on the decision of a third party.[42] A management plan for a forest that extends over decades, and may be subject to regular change may be challenging to implement as a condition of a permitted activity.

Recent public feedback indicates broad agreement[43] with the use of Forest Management Plans to ensure exotic carbon forest are managed effectively and forest owners cannot 'plant and walk-away'. In particular:

- Management of biophysical environmental effects and other risks
  Including management of fire and pest risks, planning for and managing environmental and health and safety risks in selective harvest.
- Management for forest outcomes
  Including achieving the stated goals for the exotic carbon forests, including as they relate to transition to permanent indigenous forests.

[42] Quality Planning https://www.qualityplanning.org.nz/index.php/node/611#:~:text=A%20permitted%20activity%20is%20one,specified%20for%20the%20permitted%20activity.

[43] Pre-consultation feedback on potential changes to the NES-PF and summary of submissions from the consultation on ETS options for the Permanent Forest category.

Pros

Forest Management Plans could be used to demonstrate how the exotic carbon forest would meet the requirements of the NES-PF, and also to prompt planning for potential future effects eg, how a forest would be managed as it is grown to the end of its natural lifespan or transitioned to indigenous forest.

A Forest Management Plan could provide councils with a mechanism to check compliance with regulation (either the NES-PF or their own rules) by requiring information on:

- actions and milestones to:
    - manage for biodiversity, including how weeds and pests are controlled within the forests enable
    - transition exotic carbon forest to indigenous forest eg, cutting lightwells to enable new trees to grow, timeframes to fully transition, and proximity to indigenous seed sources that can achieve canopy status
- intentions for selective or continuous cover forestry, including proposed silvicultural regime, and
- how wilding conifer spread will be managed on the forest property.

Cons

Forest outcomes may be more effectively managed at a national level rather than under the RMA as:

- an RMA instrument can only manage matters within the scope of the Act, so alignment with other Acts would be required to provide a full Forest Management Plan for all risks and effects that need to be managed eg, pest management and health and safety are managed under separate legislation and cannot in general be incorporated into an RMA instrument.
- some councils are limited in their forestry knowledge and experience, particularly as it relates to transitioning forests, so management plans may not be a meaningful or effective regulatory tool.
- the administrative costs of Forest Management Plans for councils would need to be balanced against any environmental benefits or risk reduction they may deliver.
- most exotic carbon forests will be entered in the ETS and effective mechanisms would be needed to ensure an outcomes-based management plan complied with any ETS requirements.[44]
- like most businesses, foresters must comply with all relevant legislation and a plan that sets out how these things will be managed together can be helpful for integrating a range of requirements, and for audit purposes. All of these matters cannot be dealt with through the NES-PF.

Note – We are aware of the need to ensure that any (future) requirements for the ETS permanent forest category and the requirements of the NES-PF are well aligned, and minimise duplication or overlap for users.

This option includes a number of potential variables and would require additional consultation once specific proposals have been developed. In determining the content and objectives of a Forest Management Plan we would consider how it would interact and align with other legislation and regimes (**Appendix B** refers).

Q A10 Do you agree with option 3 for managing the environmental effects of exotic carbon forestry (amend the NES-PF to require forest management plans for exotic carbon forests)? Y/N Why?

Q A11 Do you agree that forest management plans should manage [choose one] (a) environmental effects only? Y/N or (b) environmental effects and forest outcomes, including transitioning from predominantly exotic to predominantly indigenous specie(s)? Y/N Why?

Q A12 Based on your answer to the previous question, what content should be required in forest management plans?

[44] Section 187(4)(a) Climate Change response Act 2002 requires that applicants for registration in the ETS comply with the RMA but this does not encompass ongoing management of the forest.

Q A13 How effective would option 3 (amend the NES-PF to require forest management plans for exotic carbon forests) be in managing the environmental effects of exotic carbon forestry? [select from a range/scale not effective – highly effective] Why?

Q A14 What implementation support would be needed for option 3 (amend the NES-PF to require forest management plans for exotic carbon forests)?

3.3 Preferred option

Our preferred approach is to combine:

- Option 2: Add a new category of 'carbon forest' to the NES-PF, and
- Option 3: Amend the NES-PF to require Forest Management Plans for exotic carbon forests.

4 PART B: CONTROLLING THE LOCATION OF PLANTATION AND EXOTIC CARBON AFFORESTATION TO MANAGE SOCIAL, CULTURAL, AND ECONOMIC EFFECTS

4.1 Problem statement

The recent and projected increase in exotic afforestation, especially the emergence of exotic carbon forests on a significant scale, has raised concerns about adverse effects among some communities, primary sector interests, environmental non-governmental organisations (**eNGOs**) and councils. Those concerns span a range of environmental, social, cultural, and economic issues.

These issues have become more urgent. Existing controls in the resource management regulatory system can be used to manage environmental effects of afforestation but they have not been effective for managing its social, cultural, and economic effects.

This means the existing controls under the RMA may not enable councils to manage the social, cultural and economic effects on their communities of changing land use as plantation and exotic carbon afforestation increases.

Q B1 Do you agree with the problem statement set out above? Y/N Are there other things we should consider?

Social, cultural, and economic effects of plantation and exotic carbon afforestation

The potential social, cultural, and economic effects of more, and changing patterns of, plantation and exotic carbon afforestation are complex. The emerging evidence base will continue to inform our understanding (**Appendix D** refers).

The effects of plantation and permanent exotic afforestation are specific to the situation and location. Although afforestation is a real concern for some councils and communities, for others it is an opportunity.

Concerns have focused most strongly on the conversion of whole farms to forestry and on the growth in exotic carbon afforestation for carbon sequestration. Some stakeholders are also concerned about the growth in plantation forestry.[45]

Q B2 Have we accurately described the social, cultural, and economic effects of plantation and exotic carbon afforestation at a community level (Appendix D refers)? Y/N What other social, cultural or economic effects should we be aware of? Please provide evidence on the impact of these effects.

Potential regulatory controls that could be used to manage social, cultural, and economic effects

Resource consents

We have heard from some councils and communities that they want to be able to manage the social, cultural, and economic effects of afforestation by controlling the location of new plantation and exotic carbon forests through resource consents.

It is not clear how many councils or communities need a consent process. We have heard that councils would find it difficult to develop and apply rules (and objectives and policies) for social, cultural, and economic effects.

The RMA provides for the management of social, cultural or economic conditions in the definition of 'environment'. In practice, these effects have rarely been considered for rural land use, on an individual consent basis. A consent requirement to manage social, cultural and economic effects would be a significant change to the way land use for afforestation is currently controlled.

[45] For example, a report co-funded by 17 councils, Local Government New Zealand and Beef + Lamb New Zealand, comments that "The potential to transform significant swathes of sheep, beef and wool producing farmland to production forestry and permanent carbon forestry has associated opportunities and risks." Managing Forestry Land-Use under the influence of Carbon – The Issues and Options – A Green Paper (Yule Alexander, February 2022).

Expected new regulatory controls

The proposed resource management legislative reforms emphasise long-term, integrated land-use planning and environmental outcomes, while reducing reliance on consent-based decisions.

When the proposed Natural and Built Environments Act is enacted there will be a transition period during which existing RMA national direction will be transitioned to the new system. During this period, existing national direction and powers will continue to have effect.

Expected new regulatory controls that could be used to manage social, cultural, and economic effects of afforestation include:

National Planning Framework: The transition of the NES-PF to the proposed new system (the National Planning Framework, NPF) may allow a more integrated approach to managing afforestation and rural land use.

Regional Spatial Strategies: Issues of regional land use, and the best location for different activities, could be identified at a high-level in Regional Spatial Strategies to be developed under the proposed Spatial Planning Act. Plans under the proposed NBA must be consistent with Regional Spatial Strategies, and give more detailed guidance for individual activities.

Q B3 Do you agree that the social, cultural and economic effects of plantation and exotic carbon forests should be managed through the resource management system? Y/N Why?

4.2 Options to control the location of plantation and permanent exotic afforestation

Current situation

For plantation forests, afforestation is regulated by the NES-PF. In most situations it is a permitted activity subject to certain conditions. Afforestation is not a permitted activity in certain areas, such as significant natural areas (SNA) and outstanding natural features and landscapes. Councils have discretion, but no obligation, to allow afforestation in those areas. Councils may also make plan rules that are more stringent than the NES-PF to allow for protection of specified sensitive areas and to give effect to other national direction instruments.

Under the RMA, councils are also able to make plan rules to manage effects or activities outside the scope of the NES-PF. This means that:

- For plantation forests, councils can make rules to manage social, cultural and economic effects that are not managed the NES-PF.
- For exotic carbon forests, which are not managed under the NES-PF, councils can make rules to manage any effect that can be managed under the RMA. This includes the social, cultural and economic effects of exotic carbon forests, as well as their effects on the natural environment.

If the proposals in Part A of this consultation document are implemented and exotic carbon forests are brought within the scope of the NES-PF, councils' discretion to make rules for exotic carbon forests will be limited to matters that are not addressed by the amended NES-PF. They would retain the ability to make rules to manage effects that are outside its scope, including social, cultural and economic effects.

Local control or national direction

We are seeking feedback on two broad approaches that could be used to strengthen councils' ability to control the location of plantation and exotic carbon afforestation, if greater control is needed to manage social, cultural and economic effects. The two approaches are:

- Local control – rules in district or regional plans
- National direction – consent requirement

There is no preferred option. The underlying question is whether decisions on the need for, and details of, a consent process would be more appropriately made at local level, by councils, or through national direction.

Option 1: Local control – rules in district or regional plans	Option 2: National direction – consent requirement
Progressed by amending the NES-PF alongside amendments resulting from Parts A, C and D of this document, and developing a programme to support councils with implementation.	Progressed by amending the NES-PF (depending on scope, complexity and timing) either alongside amendments resulting from Parts A, C and D (if tightly targeted), or separately at a later date. This could require consultation or targeted engagement.
Amend the NES-PF to: • make explicit that councils have the ability to make plan rules and supporting policies and objectives for matters outside the scope of the NES-PF, and • enable councils to make more stringent (or lenient) rules relating to afforestation. There would be no obligation on councils to make such rules (and supporting objectives and policies). Those for whom exotic afforestation is an issue could choose to do so. As is the case at present, plan rules could be developed as a result of council land use planning.	Develop a consenting framework either under the RMA by amending the NES-PF or developing a new NES, or under the proposed new resource management legislation as part of the National Planning Framework (NPF). The consenting framework: • could apply nationally or only to some districts • could be time-limited or not • could address a number of variables including land type, forest type, scale of afforestation.

Q B4 What is your preferred option for managing the social, cultural and economic effects of plantation and exotic carbon afforestation? Select from list: Option 1 (a local control approach); Option 2 (a consent requirement through national direction); No preference; I do not support either of these options. Why?

Option 1: Local control – rules in district or regional plans

The NES-PF would be amended to enable councils to make decisions on the location of new forests, by:

- making it more explicit that councils have the ability to make rules for afforestation in relation to effects that are not within the scope of the regulations (application - clause 5), and
- allowing councils, if they choose, to make more stringent or more lenient rules for the NES-PF activity of afforestation, for both plantation and (subject to decisions on the proposals in part A of this consultation) exotic carbon forests (stringency - clause 6).

Councils will be able to introduce new rules, policies and objectives in a district or regional plan to control the location or scale of plantation and exotic carbon afforestation, to reflect local priorities and aspirations. They may choose to differentiate between areas of land, scales of afforestation, forest types and other distinguishing factors they consider important eg, to restrict afforestation in an area it considers should not be used for carbon forestry (eg, highly productive land) due to potential adverse effects on local communities. The new rules could be more stringent than the NES-PF which might permit forestry in this area.

Pros

This approach has the advantage of recognising that not all communities and regions are significantly affected by, or concerned about, exotic afforestation, and that some may only be concerned about some types of forest, on certain types of land. It provides for a more tailored approach than Option 2 and avoids unnecessary administrative and compliance costs.

The ability to develop local plan rules would support regional spatial planning and align with the proposed new resource management system, whether that planning is carried out under the RMA or the proposed NBA. It is consistent with the resource management reform emphasis on planning rather than a consent-by-consent approach to land use change.

Local plan rules developed by councils would send clear signals to the forestry sector and landowners, and support meaningful consent decisions that reflect local circumstances and priorities.

It is likely this approach would prove effective in responding to national objectives for climate change mitigation and forestry.

A programme of guidance and implementation support would be developed to assist councils with capacity constraints.

Cons

Local control can duplicate effort and lead to inconsistent outcomes between regions. This would undermine one purpose of the NES-PF, which was to make rules for plantation forestry consistent across the country, based on evidence of environmental effects, and would add complexity for the forestry sector and landowners.

There would be less certainty than the NES-PF currently provides about whether a particular site could be afforested. This may increase the cost and risk for foresters and dampen sector and investor interest. It would create particular problems where a forest would cross district boundaries.

There is also the risk of local plan rules discouraging exotic afforestation in areas that could be suitable, hampering the achievement of national forestry objectives. There is no evidence that this is happening, but if a significant number of councils introduce rules this may become a challenge.

It will take time for councils to develop plan rules, and the objectives and policies to implement them. We expect, however, that rules developed by councils will be more enduring and effective than Option 2 as they will be supported by relevant plans.

Q B5 How effective would option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) be in managing the social, cultural and economic effects of plantation and exotic carbon afforestation? [select from a range/scale not effective – highly effective] Why?

Q B6 What impact would option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) have on the rate and pattern of plantation and exotic carbon afforestation?

Q B7 What are the benefits of option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

Q B8 What are the costs or limitations of option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

Q B9 If option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) is progressed, would making plan rules to manage the social, cultural and economic effects of plantation and exotic carbon afforestation by controlling its location be a priority for your community or district? Choose from a range Not a priority to high priority Why?

Q B10 What implementation support would be needed for option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

Option 2: National direction – consent requirement

Councils would use a consent requirement to manage the social, cultural and economic effects of plantation and exotic carbon afforestation. The consent requirement would be developed either under the RMA by amending the NES-PF or developing a new NES, or under the proposed new resource management legislation as part of the National Planning Framework (NPF).

The consent requirement could:

- apply nationally or only to some districts
- be time-limited or not
- address a number of variables including land type, forest type, scale of afforestation.

If progressed, this would be a significant extension to the regulatory controls used by councils.

The impact of the consenting requirement would depend on the scope and detail of its design eg:

- the type of land it would apply to and how to identify and define that land

- whether the same requirements would apply to all afforestation (eg, would there be different consent pathways for plantation, exotic carbon, and transitional afforestation)
- the scale of the afforestation it would apply to and how this should be defined (eg, by setting a threshold defined in hectares, or as a percentage of the regulated unit such as a farm run as a single operation)
- the activity status and matters of discretion, that define the social, cultural, and economic effects a council may consider
- whether to direct consents to regional or territorial authorities
- whether some activities need mandatory conditions
- whether notification should be mandatory, or should be prevented, in some situations
- whether this approach is needed only in some parts of the country, or limited in another way (an NES rule can be limited by time or place).

Example of a design for a consent requirement

The more the consent requirement is tailored to different situations, the more complex it will be to design and apply. Table 3 sets out possible approaches to design a consent requirement – these are illustrative and not exhaustive.

Table 3: Possible approaches to design a consent requirement

Issue	Possible approach	Discussion
On what types of land would plantation or exotic carbon afforestation need a consent?	Land that requires a consent could be defined in different ways, e.g.: ▪ Consents could be required for all afforestation, or ▪ Consents be required only on some land, e.g., highly productive land (HPL) or particular LUC classes.	An NES can define land that would need a consent in different ways eg, by referring to the existing erosion susceptibility classification (ESC), or other tools (eg, HPL or the Land Use Capability (LUC) classification). Any method must be clear and certain. Provisions would be required for how to consider applications that span more than one type of land.
What scale of plantation or exotic carbon afforestation would need a consent?	Thresholds could relate to the area to be afforested, in absolute terms, or as a percentage of a farm or other regulated unit eg, consent required for: ▪ forests over 5 ha, or over 10 ha ▪ afforestation of more than 10% of the area of a farm operated as a single unit. Different thresholds could apply to different land types e.g., consent required for: ▪ forests larger than 50, 75 or 100 hectares on LUC 1 to 5 ▪ forests larger than 200ha on other land.	Thresholds associated with the type of land would enable tighter control of the scale of afforestation on more versatile soils, to manage the availability of this land for future uses, and encourage afforestation in other areas. Higher thresholds would encourage small-scale afforestation while managing large-scale and 'whole farm' conversions to forestry, to encourage the most productive use of land and retain the viability of local farming.
Should a consenting framework distinguish different types of afforestation?	A consent system could distinguish between different forest types eg, when considering a new forest on a particular type of land: ▪ a plantation forest may be 'controlled' or subject to a higher area threshold ▪ an exotic carbon forest could be fully discretionary or subject to lower thresholds. Short rotation forests, e.g. for biofuels could be treated differently from those with long rotations.	Distinguishing between forest types would give more direction to councils, and recognise that different forest types have different effects on communities. Provisions to manage a change of intention after consent is granted may be needed, depending on the rules.

Pros

A national direction approach has the advantage of greater consistency than local control, albeit with some variation and uncertainty in the absence of national policies and objectives to guide consent decisions. It would avoid duplicating effort across councils, since standards would be set nationally.

Depending on the scope and complexity, it could be more quickly put into operation than locally developed rules; although rules would have only limited effect without the supporting policies and objectives.

A NES can provide direction on processing a consent and what matters to consider. It can also prevent consideration of some matters, for example, within a consenting framework as illustrated above, matters of discretion could indicate that a council should consider:

- How the forest will be managed, including the level of production and how the forest will transition from exotic to indigenous species if this is proposed
- Measures to minimise the loss of productive land to exotic carbon forestry
- The effects on the community of any loss of productive land, particularly highly productive land

An NES, or rules in it, can also provide more direction in some circumstances. For example:

- Rules can vary for different parts of the country (eg, tighter thresholds in some parts of the country).
- Rules can be targeted or apply only in some situations.
- An NES can set a standard (e.g., a cumulative effect standard) which would limit the ability of councils to grant consents in some situations.

Cons

A consent based approach to managing land use change does not give councils any real ability to consider the cumulative effects of afforestation. For all except the very largest proposals, it will be difficult to identify the social, cultural and economic effects of individual applications. This approach does not align well with the aim of the resource management reforms to reduce reliance on a consent-by-consent approach to land-use change.

Depending on the design of the consent regime, uncertainty about the ability to obtain a consent may deter investors and farm foresters. This could constrain progress towards national objectives for carbon sequestration and the Industry Transformation Plan for the forestry and wood processing sector.

If the NES consenting provisions apply nationally, all councils will need to develop objectives and policies over time, and to process consents. This will add to their workload even in areas where afforestation may not be a significant issue, and for little benefit, if consents are routinely granted. It will also add compliance costs for foresters.

If option 2 (a consent requirement through national direction, to control the location of plantation and exotic carbon afforestation) is further developed:

Q B11 Are the variables outlined above (type of land, scale of afforestation, type of afforestation ie, plantation, exotic carbon, transitional) the most important ones to consider? Y/N What, if any, others should we consider?

Q B12 Which afforestation proposals should require consent? (Please consider factors such as the type of land, the scale of afforestation, the type of afforestation (plantation, exotic carbon, transitional) and other factors you consider important).

Based on your answers above:

Q B13 How effective would option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation) be in managing the social, cultural and economic effects of plantation and exotic carbon afforestation? [select from a range/scale not effective – highly effective] Why?

Q B14 What impact would option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation) have on the rate and pattern of plantation and exotic carbon afforestation? Please explain or provide evidence.

Q B15 What are the benefits of option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

Q B16 What are the costs and limitations of option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

Q B17 What are the most important and urgent social, cultural and economic effects of plantation and exotic carbon afforestation that you would like to see managed under the resource management system? Where and at what scale do these effects need to be managed?

Q B18 Should this be done now under the RMA, or later under the proposed National Planning Framework and NBA plans?

Q B19 Would standards in an amended NES-PF need the support of national policies and objectives? Y/N Why?

Q B20 What implementation support would be needed for option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

5 PART C: IMPROVING WILDFIRE RISK MANAGEMENT IN ALL FORESTS

5.1 Opportunity statement

In Aotearoa New Zealand, there is no uniform regulatory or cross-agency approach to fire management, in the context of land use or natural hazard planning.

There is an opportunity for the NES-PF to have a role in enabling and improving wildfire risk management in all forests within scope of the NES-PF. The focus of this proposal is to reduce the environmental effects that a wildfire in a forest might pose.

This would be a standardised national approach, implemented by each forest owner or manager according to their site and circumstances. The national approach should raise wildfire awareness of all landowners with forests or woodlots and include planning where forests go, how they are established, and ongoing management.

5.2 Context

Why is wildfire an issue for forests?

Forests, while part of the solution to climate change, provide a great fuel source for wildfires. Through climate change, wildfire as a natural hazard is likely to increase across New Zealand based on predicted increases in very high and extreme fire weather danger days. Since 2000, the number of wildfires across all land uses has climbed steadily to a peak in the 2019/20 season.[46] All forests are at risk– this includes indigenous forests, plantation forests for harvest, permanent exotic forests planted for carbon, and wilding conifer forests.

The likelihood of a fire igniting, and the way the wildfire behaves is influenced by the fire environment – a combination of fuel, weather and topography. The fire environment determines the wildfire's intensity, how quickly it will spread and the direction of travel. Generally, severe wildfires occur under conditions of low rainfall, high temperatures, low humidity, and strong gusty winds, or a combination of these. Drier conditions leading to increasing fire danger are likely to coincide with drought conditions with the lack of reliable water supplies to support suppression options further adding to the overall risk.

Fires in plantation forests are generally caused by arson, escaped burns, forestry operations, spontaneous combustion, and activities on neighbouring land. In the last five years, the main risk to plantation forests has been wildfires starting on land outside the forests and spreading into them.

How the wildfire risk is considered during establishment and management of a plantation forest will largely determine the options and ability to manage wildfire incidents in the forest.

What are the costs of wildfires?

Environmental effects	Economic and social cost	Government's environmental outcomes not met
• smoke carries particulates that affect air quality and can lead to health issues • release of carbon dioxide contributes further to climate change • some soils affected by wildfire develop water repellence (hydrophobia), reducing moisture retention capacity and breaking down soil structure • the removal of large areas of vegetation can affect soil stability	• loss of the timber crop • loss of carbon credits • damage to forest infrastructure • damage to regional or national infrastructure • rehabilitation and re-establishment costs • loss of employment • loss of cultural values, including hunting and recreation • costs to control wildings	• reducing greenhouse gases, and meeting the target of zero carbon emissions by 2050 • National Environmental Standards for Air Quality (NES-AQ) • better water quality and less sedimentation of fresh and coastal waters.

[46] Wildfires cover all vegetation fires, including forest fires.

• heavy rainfall following wildfires can cause sediment to enter waterways • loss of vegetation means a loss of habitat and biodiversity, and cultural and recreational values • post-fire wilding irruption from soil seed sources.	• disruption to other networks, power, road, air if close to where the fire is occurring.	

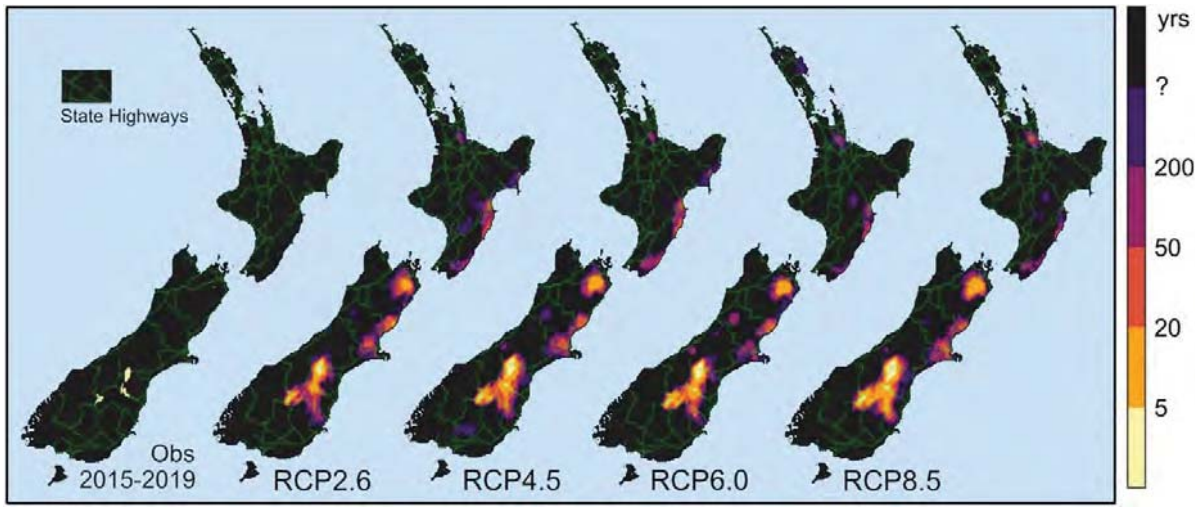
Climate change will increase risk

SCION predicts the wildfire risk will increase with climate change,[47] with most areas of the country likely to see an increasing number of very high or extreme fire weather danger days per annum. This increase and the expected rates of afforestation will alter the fire environment at a landscape level, in all regions.

A warmer climate could also increase invasive weed species, pests and diseases that affect the health of plantation forests. These could all lead to an increase in dead or stressed trees, adding to the fuel loading and intensity of a wildfire.

The months of October through to April are traditionally 'wildfire season' in New Zealand. With climate change, the season may start earlier and finish later. The 2020-2021 season ran from the end of August to the end of April – nearly eight months. For example. the Pukaki wildfire occurred in August. This threat extends to pasture, crops and vegetation, which can dry out rapidly, and fuel a fast-moving fire.

Figure 4. Return period of very-extreme wildfire weather conditions in the 21st-century[48].



How is wildfire managed?

For plantation forestry, the 4Rs of fire management are:

- **Risk reduction** – Identify and evaluate the risk of fires, and then reduce the opportunity for them to start or spread. Before establishing a forest, a risk assessment would consider: the species being planted; the weather; topography; values at risk within and neighbouring the forest; suppression and containment options; access to water for firefighting, mitigation measures which can be built into the development and management of the forest.
- **Readiness** – Monitor the fire danger, have and maintain equipment and supplies (eg, water sources, firefighting equipment), access ways and fire breaks, and regularly inspect at-risk areas.

[47] https://www.scionresearch.com/about-us/about-scion/corporate-publications/scion-connections/past-issues-list/scion-connections-issue-31,-march-2019

[48] Figure 4 was developed by fitting the Australian 2019/2020 style "Black Summer' FWI mean values. Melia, N., Dean, S., Pearce, H. G., Harrington, L., Frame, D. J., & Strand, T. (2022). *Aotearoa New Zealand's 21st-century wildfire climate*. Earth's Future, https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2022EF002853.

- **Response** – Support Fire and Emergency NZ (FENZ) to take fast, safe and thorough action to minimise the impact of wildfire on forest land and the wider environment.
- **Recovery** – Recover, repair or replace damaged firefighting and forest assets, and incorporate lessons learned into planning for any future event. Rehabilitate sites disturbed by the fire and by fire control to minimise the environmental impact. Collaborate with appropriate landowners/authorities/organisations for ongoing recovery.

The 4Rs need to be considered from the perspective of both an individual property and the broader community. In emergencies rural communities rely on local knowledge and social connections, so planning should recognise and provide for community needs and involvement.

FENZ

FENZ was established in 2017, with the statutory responsibility to promote fire safety, including providing guidance on the safe use of fire as a land management tool. FENZ also provides fire prevention, response and suppression services. FENZ has service agreements with many of the larger forestry enterprises. The agreements with forest management organisations (FMOs) formalise working relationships, and provide clarity about availability, training and authorisation of the FMO resources (personnel and fire equipment) that may be available to respond to wildfires.

New Zealand has 14,000 smaller plantations on farms and small properties. As there is no mechanism to know where these are and when they are being established, FENZ cannot easily engage with all these owners. Engagement is usually through local councils and farming/forestry groups, or national wildfire awareness campaigns. FENZ would like to have better information about where forests are, and what plans are in place to address the wildfire risk. This will greatly assist in supporting a range of activities to help manage the risk.

The Plantation Forestry Rural Fire Control Charter, signed in 2017 and again in 2021 between FENZ, NZFOA, NZFFA and Te Uru Rākau – New Zealand Forest Service, commits all signatories to reducing the incidence and consequence of wildfires through risk planning and reduction. The signatories will work together to:

- develop and promote objectives and actions to improve wildfire management for New Zealand, and
- communicate these objectives to their members and personnel, the wider public, and specifically the communities they impact.

In 2018, the NZFOA produced the *Forest Fire Risk Management Guidelines*.[49] This includes the *Forest Operations Fire Risk Management Codes*, which suggest limits on forestry activities as fire risk increases.

The Department of Conservation (DOC) manages the largest proportion of New Zealand's forests, and the New Zealand Defence Force (NZDF) has large amounts of vegetation on the lands it manages. Although neither agency generally manages plantation forests, both have a number of wilding conifer forests on their lands. Both have traditionally made up a very significant part of the rural wildfire response, and maintain wildfire response plans and service level agreements with FENZ.

Councils NZFOA

Wildfire is a natural hazard, and councils can manage the risk as a matter of national importance under section 6(h) of the RMA. Councils across the country have widely differing approaches. Some require boundary setbacks between dwelling and forest plantings, while others do not recognise wildfire as a natural hazard.

Although boundary setbacks are helpful, they are not enough to minimise all environmental impacts from a wildfire in a forest. For example, setbacks from neighbouring properties will not help limit a wildfire spreading through a plantation forest.

[49] https://nzfoa.org.nz/resources/file-libraries-resources/standards-and-guidelines/670-forest-fire-risk-management-guidelines/file

Large plantation forestry enterprises

The value of forest assets is such that fire protection has always formed an integral part of forest management. Most medium to large enterprise forest managers see fire protection as an essential part of their responsibilities. For example, having comprehensive risk reduction and readiness plans, training programmes for staff fire crews, fire appliances and equipment.

Smaller forest owners

The level of planning for or managing wildfire, varies depending on the forest owners' background. Good support is available from the New Zealand Farm Forestry Association or Federated Farmers. Most small forest owners are unlikely to have the response infrastructure or fire-fighting crews that larger enterprises can mobilise.

Farm woodlots

Landowners growing small woodlots on farms or lifestyle blocks may have little or no awareness of the wildfire risk. They are also unlikely to have arrangements in place to help mitigate that risk.

What is the regulatory approach to fire?

There is no uniform regulatory or cross-agency approach to fire management, in the context of land use or natural hazard planning.

5.3 Proposal to improve wildfire management

Proposal: Require all forests over 1 hectare to have a wildfire risk management plan

All forests covered by the NES-PF (ie, forests larger than one hectare) will be required to prepare a wildfire risk management plan (WRMP) and attest to its completeness as part of their NES-PF notification or consent process.

This proposal aims to ensure those planting forests consider the wildfire risk, put in place mitigation measures and share information to reduce the impacts on the environment.

The WRMP would address a range of information, such as:

- wildfire environment (vegetation, topography, adjacent land use, and weather) when determining how the plantation forest will be established and managed, with a view to limiting the spread of a wildfire and minimising the area damaged.
- strategies to manage a wildfire, and what tools/features would assist these (eg, proximity to water supplies, access tracks, forestry signage, sharing of geospatial information with emergency services and helicopter landing sites).
- values at risk, and measures to minimise the impacts eg, how to reduce the wider impacts of a wildfire to or from neighbouring properties.
- how to detect a wildfire that starts within or adjacent to the plantation forest.
- how to manage diseases, weed and pest species, to reduce fire risk.[50] The plan should only need to address matters under the forester's control, for example, how pests and weeds directly affect fire risk, and placing conditions on permitted hunters' behaviour, such as not allowing access without permission.
- after a wildfire, the actions that would minimise the impacts on the environment eg, placing barriers on hill slopes, to slow water flow and prevent sediment from entering streams.

[50] Forest disease can create higher fuel loads from dead or damaged wood and some weed species (e.g. gorse) are highly flammable; pest species such as deer and pigs attract hunters which increases the potential for people in the forest, with attendant risk of accidental ignition.

What would this mean for different sizes of forests?

We are proposing that the requirements for a WRMP could vary according to the size of forest. For example:

- A simple version for smaller blocks (eg, 1-10 hectares). The focus would be on raising awareness, encouraging self-identification of risks, understanding where external advice might be required, and encouraging conversations between neighbours.
- A more comprehensive plan for bigger areas (eg, 10-40 ha). The focus would be similar to that for the smaller blocks, but with more focus on actively minimising risk and being prepared for the fire season, as the consequences of loss to the forest and the surrounding area rise.
- Forests over 40 ha would require a more comprehensive plan that includes fire risk reduction, readiness, and initial response actions. Most large forest companies already have these as part of their forest management plans, including through Operational Service Agreements with FENZ.

What are the regulatory requirements for a plan?

We are proposing that a plan must be prepared, with matters to address set out in a schedule of the NES-PF. FENZ and Te Uru Rākau – New Zealand Forest Service would work with NZFOA, NZFFA and other interested parties to develop templates and guidance material for forests.

The intent of requiring a plan is to ensure wildfire is considered in both planning and managing the forest over its life cycle, proportional to the size of the risks. The landowner or manager should consider engaging with other agencies or individuals that may have a part in the plan, including neighbours. A key aspect of the planning is identifying vulnerabilities, resources, access routes and contacts in the area.

Where afforestation is a permitted activity, the person notifying the activity would need to attest that a WRMP has been prepared and is held by the notifier where it can be referred to in the event of a fire. We are not proposing that councils are responsible for the plan, as FENZ has the statutory responsibility for fire management, and few councils have the knowledge or systems to use the plans meaningfully. However, where a WRMP is a requirement of a permitted activity, the council would be able to request a copy of the plan to verify that conditions have been met. Where afforestation requires a resource consent, the council would be able to request a copy of the plan as a matter of discretion if there is a demonstrated benefit to them holding it. We note that resource consents are public documents, so the plan would be available in the public domain.

Where a forest already has a fire plan which covers the required matters there would be no requirement to develop a new plan.

Could farmers include fire management in their farm plans?
Under this proposal, farmers planting forests would need to comply with the requirements in the NES-PF as part of their notification or resource consent. Te Uru Rākau - New Zealand Forest Service and FENZ could work with the integrated farm plan team at MPI to develop a WRMP module that is consistent with farm plan templates.

Could farmers include fire management in their farm plans?
Under this proposal, farmers planting forests would need to comply with the requirements in the NES-PF as part of their notification or resource consent. Te Uru Rākau - New Zealand Forest Service and FENZ could work with the integrated farm plan team at MPI to develop a WRMP module that is consistent with farm plan templates.

How would WRMPs work as a component of a wider forest management plan?

How would WRMPs work as a component of a wider forest management plan?

In Part A of this discussion document, option 3 would require forest management plans for all exotic carbon forests. Managing wildfire would be an important component of such a plan, using similar criteria. Some aspects of managing a carbon forest over the long term may differ from those for a plantation forest for harvest (eg, managing fuel loads as these will not be significantly reduced though harvest). If forest management plans were introduced, we would develop wildfire management content to align with the templates for those plans.

Q C1 Do you agree that wildfire risk management plans (WRMPs) should be included in the NES-PF? Y/N Why?

Q C2 Do you agree that the role of councils in monitoring the WRMP should be limited to ensuring that a plan has been developed? Y/N If not, what should the role of councils be?

Q C3 Do you agree that a five-year review requirement is appropriate for WRMPs? Y/N Why?

Q C4 Do you agree that a module for a WRMP that is consistent with farm plan templates could be used for farmers with forests to plan for managing wildfire risk? Y/N If no, please provide reasons.

Q C5 What implementation support would be needed for this proposal?

6 PART D: ENABLING FORESTERS AND COUNCILS TO BETTER MANAGE THE ENVIRONMENTAL EFFECTS OF FORESTRY

6.1 Opportunity statement

Te Uru Rākau – New Zealand Forest Service and the Ministry for the Environment carried out a review (the review) of the NES-PF in 2019-20, focusing on specific areas set out in the Terms of Reference.[51] A report on the findings was provided to Ministers and is on the Te Uru Rākau – New Zealand Forest Service website[52].

The review found that, overall, the NES-PF is an effective framework for maintaining or improving the environmental outcomes associated with plantation forestry activities. However, changes in some areas could improve outcomes.

We are consulting on amendments to address some of the key findings in the review, as well as operational amendments identified since the regulations came into force in 2018. These are:

- wilding conifer risk management
- slash management
- initial alignment with NES–Freshwater; and
- operational amendments.

We are also inviting feedback on the support that local authorities need to implement the NES-PF.

It is our expectation that the outcomes of this consultation would apply to all forests covered by the NES-PF and/or a new national direction.

6.2 Wilding conifer risk management

6.2.1 Context

The term ‘wilding conifer’ refers to a range of exotic conifer tree species that have self-established away from their planted parent tree. An exotic conifer that has been intentionally planted is not a wilding conifer, and not all exotic conifers carry the same risk of spread.

All planted trees carry a risk of spreading into areas where they are not wanted. The risk depends on how far the seed can disperse, and the potential of that seed to establish. The impact of this spread is directly associated with the potential to disrupt the use or conservation values of the land they spread to.

Historical use and experimentation with different exotic tree species have contributed significantly to New Zealand’s wilding problem to date. Wilding conifer spread is often a legacy of erosion control planting by central and local government, but new forests and farm shelter belts can also spread. These legacy wilding conifers cover around 1.7 million hectares, with over 70 per cent estimated to be in the South Island.[53] If wildings are left uncontrolled, the cost to New Zealand in lost production is estimated at $4.6 billion over the next 50 years.[54] As part of Budget 2020, the Government committed $100 million over four years to tackle wilding conifers,[55] an extensive expansion of the National Wilding Conifer Control Programme (NWCCP).

[51] For the terms of reference, see https://www.mpi.govt.nz/dmsdocument/32878-Terms-of-Reference-for-Year-One-Review-of-NES-PF
[52] https://www.mpi.govt.nz/dmsdocument/44914-Report-on-the-Year-One-Review-of-the-National-Environmental-Standards-for-Plantation-Forestry
[53] The right tree in the right place: New Zealand Wilding Conifer Management Strategy 2015-2030. https://www.wildingconifers.org.nz/assets/Uploads/2014-new-zealand-wilding-conifer-management-strategy-3.pdf
[54] Benefits and Costs of the Wilding Pine Management Programme Phase 2 – December 2018. https://www.wildingconifers.org.nz/assets/Uploads/Benefits-and-Costs-of-the-Wilding-Pine-Management-Programme-Phase-2.pdf
[55] https://www.beehive.govt.nz/release/budget-2020-jobs-and-opportunities-primary-sector

Exotic conifer species, in particular radiata pine (*Pinus radiata*) and Douglas fir (*Pseudotsuga menziesii*) have high commercial value to New Zealand as plantation forestry species. *P. radiata* in most cases is considered a low spread-risk species, and accounts for around 90 per cent of the plantation forestry estate by area. Douglas fir accounts for 6 per cent but, under certain conditions, carries a much higher wilding risk.[56]

The evidence suggests that planting behaviour has been changing over time. This is most noticeable in the reduced use of higher risk species, particularly Douglas fir (see box). Douglas fir is an otherwise valuable timber source for the plantation forestry sector, but we appear to be seeing increased caution about wilding risk. Further improvements to the calculator should continue to drive these behavioural shifts where required.

Fewer high-risk species are being planted

The planting of Douglas fir, considered a higher risk wilding species in some parts of the country, has significantly reduced since 2012. MPI data shows that Douglas fir seedling sales have reduced by three-quarters since 2012– see graph below.[57] This is reflected in the total area of Douglas fir plantings also halving over the last five years, compared to previous five-year periods.[58]

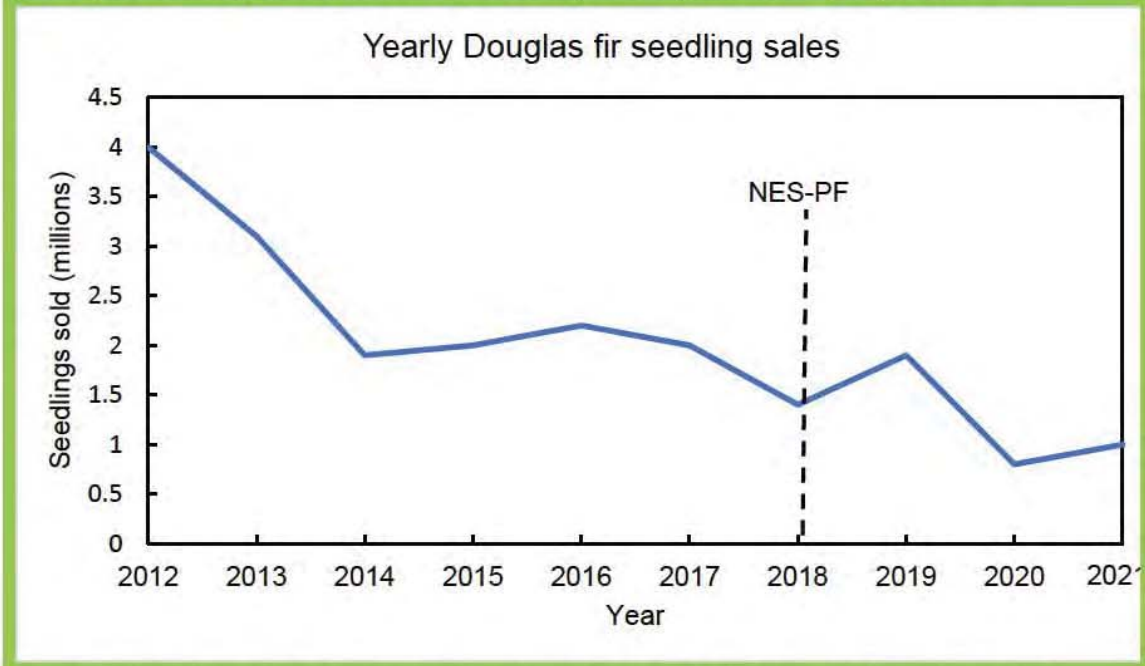


Figure 5: Yearly Douglas fir seedling sales between 2012 and 2021 sourced from MPI's 2021 Nursery Survey. Marked on the graph is the year the NES-PF came into force in 2018. * denotes provisional data for 2021.

The requirement for a resource consent when the calculator threshold of 11 is exceeded may have shifted foresters towards planting lower risk species. Anecdotal information from foresters supports this, but data from the National Monitoring System[59] records no resource consent applications.

[56] 'Mitigating worries with wildings', Ledgard 2006, *New Zealand Journal of Forestry*.
[57] Between 2011 and 2017, an average of 2.9 million Douglas fir seedlings sold per year. This reduced to 1,000,000 (provisional) in 2021. MPI 2021 Nursery Survey: https://www.mpi.govt.nz/dmsdocument/44971-Provisional-estimates-of-tree-stock-sales-and-forest-planting-in-2021
[58] Table 12 and figure 16 of the 2021 National Exotic Forest Description: https://www.mpi.govt.nz/dmsdocument/43540-2021-NEFD-report
[59] The Ministry for the Environment manages the National Monitoring System that collects information from local authorities on their implementation of the RMA, and is current until the end of March 2020. This includes information on all resource consents issued: https://environment.govt.nz/what-government-is-doing/areas-of-work/rma/national-monitoring-system/

It appears replanting behaviour has also shifted. Planting intention surveys show that across almost all regions, foresters are not intending to replant their forests with Douglas fir.[60]

The NES-PF manages wilding risk of new afforestation

The wilding conifer risk for new plantation forests at afforestation is regulated through the NES-PF. The NES-PF does not regulate the management of legacy wilding conifers, and has limited application to wilding conifer control on property under different ownership. The NES-PF recognises that wilding risk varies according to the site and species used, and seeks to manage these risks. It assesses risk through the Wilding Tree Risk Calculator, and it is this assessment that underpins the regulatory controls. If a consent is required, councils have the power to refuse consent or place a wide range of conditions on an afforestation consent.

The review found that preventing wilding spread from plantation forests is complex and requires a systemic approach to be effective. This system extends beyond the RMA, to the Biosecurity Act and the individual approaches of councils and landowners to fulfilling their biosecurity responsibilities to manage trees that have spread. Where wilding risk is low or can be managed effectively, the regulations are appropriate. When wilding risk is higher, or uncertain, changes could improve management and better represent the policy intent.[61] The changes fall into three areas:

- Wilding Tree Risk Calculator.
- applying the calculator; and
- current policy settings.

Wilding Tree Risk Calculator and its application

The Wilding Tree Risk Calculator was developed as a decision support tool to guide better afforestation decisions. The calculator draws on extensive research,[62] and was last updated in June 2012. It is incorporated by reference in the NES-PF, and its output underpins the regulations and policy.

The Wilding Conifer Technical Advisory Group (TAG)[63] has provided Te Uru Rākau – New Zealand Forest Service with scientific and technical advice to update the calculator and address the issues identified in the review. Their advice reflects areas where research has progressed on wilding tree spread and risk assessment. A summary and the full report of the TAG's recommendations is in Appendix E.

Te Uru Rākau – New Zealand Forest Service and Biosecurity New Zealand will work with the TAG to progress these recommendations. Where there is enough information and evidence, these changes will be incorporated into an update of the calculator, to reflect current scientific knowledge and better reflect the risk posed.

The current guidance will be updated. Te Uru Rākau - New Zealand Forest Service will develop a training programme for council consenting staff, and a worksheet template for use by a suitably competent person.[64]

Policy settings

An up-to-date calculator that is applied appropriately can give an accurate assessment of known risk at a point in time. However, as the forest grows, this level of risk may not remain static, either because

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[60] Wood Availability Forecast – New Zealand 2021 to 2060. Chapter 3.3.2: https://www.mpi.govt.nz/dmsdocument/47671-Wood-Availability-Forecast-New-Zealand-2021-to-2060

[61] Chapter 4.5.3 Policy Settings in the Year One Review.

[62] The calculator was developed by Scion (NZ Forest Research Institute Ltd, a Crown Research Institute) using research by Scion and other organisations. The calculator and its guidelines are intended to be updated periodically on the basis of new research.

[63] TAG Members: Fiona Thomson (Department of Conservation), Philip Grove (Environment Canterbury), Peter Weir (Ernslaw One), Duane Peltzer, Norm Mason (Manaaki Whenua - Landcare Research), Brian Richardson (Scion/Forest Owners Association), Thomas Paul (Scion), and Rowan Sprague (Wilding Pine Network). Other Contributors: Sarah Wyse (Canterbury University), and Phillip Hulme (Lincoln University).

[64] As defined in Regulation 11 (2) of the NESPF.

conditions change (eg, adjacent land use), or because our understanding of risk improves. This means policy settings need to allow for changing circumstances.

Difficulties in addressing changing circumstances

Changes in the use of surrounding land is a significant contributor to changes in the associated wilding risk of a plantation forest, or indeed of a shelter belt of exotic species. Such changes are unpredictable and are not within the control of a plantation forest owner. In New Zealand, land use changes are relatively common. When there is a decrease in grazing pressure, or fire, there is a higher risk of seed from adjacent plantation forests establishing.

Climate change will also affect wilding risk. Changing climatic conditions will alter the favourable growing conditions for exotic conifers in many regions.[65] Climate change will also affect other land uses, increasing the likelihood that surrounding land uses will change over time for plantation forests in many regions.

When trees do spread, forest owners have no legal right to access neighbouring properties to control wilding spread. They can seek agreements from neighbouring landowners for access. Such arrangements are fairly common, but are liable to change over time. Regional councils can also develop and enforce controls under the Biosecurity Act, but these share the cost of control across all affected landowners and cannot target the source.

Managing wilding conifers under the Biosecurity Act

Under the Biosecurity Act, regional councils have some ability to manage wilding conifers. When regional councils identify them as a pest in a regional pest management plan (RPMP), the RPMP sets out priorities and goals for managing them. Regional councils can use both regulatory and non-regulatory mechanisms to do this.

RPMPs can be used to manage wilding conifers in several ways. First, the species must be specified as a pest, either outright or under described circumstances, eg, when in a wilding state. RPMPs can then:

- Prohibit the propagation or any new establishment of those species when declared outright as a pest species.
- Establish a programme with rules to manage the pests. Regional councils use the following rules:
    - requiring property owners to maintain control of wilding conifers when previous control has been undertaken on that land
    - good neighbour rules: to manage wildings spilling across boundaries (eg, properties) where wildings are managed on the adjoining property, and
    - pest agent rules: to manage conifer individuals or populations that interfere with the management of wilding conifers.

Although RPMPs are not mandatory, all regional councils currently have one. The degree to which wilding conifers are addressed varies across the 16 RPMPs.

6.2.2 Proposals to manage wilding conifer risk

Managing wilding risk from plantation forests is a complex interaction between the science, the policy and the current legislative landscape. The issues from the review reflect this. To reach an effective balance in wilding risk assessment and management, the most appropriate adjustments will be achieved with a combination of actions based around the issues identified. We considered a range of options for managing these issues and developed two that we consider will address the key issues identified in the review.

Our preferred approach is to adopt both of the proposals outlined below.

Proposal 1: Update the Wilding Tree Risk Calculator and guidance, and require the submission of a standardised worksheet assessment to councils at least six months prior to planting

- update the calculator, guidance and template worksheets.

[65] 'Future climates are predicted to alter the potential distributions of non-native conifer species in New Zealand,' Etherington, Peltzer and Wyse 2022, *New Zealand Journal of Ecology*.

- require worksheets with supporting information and score to be provided to councils 6 to 8 months prior to afforestation.

The calculator assessment provides the evidence of wilding risk for an afforestation proposal. It provides a point in time assessment, based on the species being planted and how likely seed will spread and establish in the surrounding land. The consistency and quality of the assessment depends on the research it is based on. To address this the TAG recommended that calculator score sheets follow a standard format which provides instructions at each step. Under this proposal the working calculations for the score will need to be submitted to councils alongside the score.

Regulation 10(2) requires that a wilding conifer score be provided to councils along with notice at least 20 and no more than 60 working days before afforestation begins. The Year One Review found that a minimum notification period of 20 working days for wilding conifer scores was too short. It didn't allow councils and foresters enough time to address any potential discrepancies before foresters have committed resources, such as ordering seedlings. This proposal extends the minimum notification period to six months and no later than eight months before afforestation begins.

Te Uru Rākau – New Zealand Forest Service will lead the update of the calculator with expert input. Giving effect to the changes will require the following amendments to the regulations:

- small wording changes to reflect any changes to threshold numbers.
- requiring submission of an assessment based on a worksheet template.
- addition of a worksheet template either within the calculator guidance (which is already incorporated by reference) or as a new schedule.
- changes to the notification times.
- provision for any species no longer covered by the calculator.

Q D1 Do you agree with Proposal 1 for managing wilding risk (update the Wilding Tree Risk Calculator and guidance, and require the submission of a standardised worksheet assessment to councils at least six months prior to planting)? Y/N If not, please explain why.

Q D2 Do you agree that extending the notification period for wilding conifer scores to no sooner than six months and no later than eight months before afforestation begins is an appropriate length of time? Y/N If not, what timeframe would you suggest and why?

Proposal 2: Require all forests to assess wilding tree risk at replanting

- at replanting, all forests are reassessed for wilding risk and all other afforestation requirements.

Under this proposal, the replant regulations will be amended to ensure changes in wilding risk over time are managed through a reassessment before replanting. At present no reassessment is required because when the rules were developed, foresters were held to have existing use rights as long as the activity was of the same scale and intensity. This means all forests at replanting will be assessed and controlled under the same rules as at afforestation.

Regulation 79(6) sets out replanting requirements for eradicating wildings established in SNAs and wetlands. We are proposing minor amendments to ensure this regulation includes the same property limits set out in regulation 11(5). This will remove any implication that the regulation is requiring landowners to enter another landowner's property and carry out wilding eradication. This will not prevent people from making private arrangements to eradicate wilding conifers if this is agreeable to both parties.

Q D3 Do you agree with Proposal 2 for managing wilding risk (require all forests to assess wilding tree risk at replanting)? Y/N If not, please explain why.

Q D4 Do you agree that changes to regulation 79(6) will clarify the intent and avoid confusion over property access rights? Y/N Why?

6.3 Slash management

6.3.1 Context

The NES-PF defines 'slash' as "any tree waste left behind after forestry activities". It is also known as 'woody debris' or 'harvest residues'. Slash is generated during mechanical land preparation, pruning and thinning, road building, and harvest. The bulk of material is generated at harvest. It ranges from small branches and bark to larger ends of trees for which there is no ready market at the time of harvest.

A large amount of forestry slash is removed from forests in some regions, and has a range of uses, such as process heating, and pulp and paper production. Slash is a valuable biomass that could be better used. Harvest residues account for an estimated 15 per cent of the harvested volume from a stand. The amount of residue produced by a particular site depends on factors such as location, terrain, and felling techniques. Harvest residues left on site are greater in regions without markets for short or small-diameter logs and biomass, or in difficult terrain where getting slash to the landing is challenging.

The Government has committed to carrying out research to increase the proportion of harvest residues that can be removed and used as biomass. Action 14.4.2 in the Emissions Reduction Plan is to undertake research to support cost-effective recovery of harvest residues, to supply biomass.[66] This will be taken forward through the Forestry and Wood Processing Industry Transformation Plan, which was released for public consultation in August 2022.

A certain amount of slash left on site is important for recycling nutrients within the forest. Letting slash decompose naturally on site can reduce the need for fertilisers and other methods to improve productivity. If slash is removed entirely from poorer productivity sites, there could be fewer nutrients for the next generation of trees. This is a growing concern as biomass markets accelerate and build demand for slash.

Where slash is left on site, perhaps because the cost of collecting and removing slash is uneconomic, foresters must ensure it is safely placed and managed, so it does not impose a risk to neighbours and downstream communities.

NES-PF requirements for slash left on site

Safe management of slash is the focus of the slash regulations, which set out requirements for managing slash on the cutover and landings. This is to ensure that it is stable and cannot move during high rainfall weather events, particularly into waterways, where it can block fish passage or cause downstream damage to the waterway, land or infrastructure.

Slash management is not a stand-alone activity. It is an integral part of earthworks and harvesting, and must be planned accordingly. Harvest management plans apply a site-specific, risk-based approach to managing the environmental risks of forest harvest. Because every forestry site is different, on-site judgement plays a significant role in planning. This includes the location of landings, the way trees are felled and extracted, the amount of material brought from the cutover to the landing, the way it is stored or removed, and the ongoing risk-monitoring of slash left on site.

Does the NES-PF appropriately provide for environmental risk from slash?

The Year One Review[67] considered whether the NES-PF appropriately provides for the environmental risks associated with slash to be avoided, remedied or mitigated. It found the NES-PF slash management requirements are generally appropriate in directing operators to assess, plan for and manage these risks. However, a number of amendments could improve clarity and more clearly direct effort to the most important areas of risk.

Slash management regulations are set out in regulation 69 and in Schedule 3(5). Regulation 69 has clarity issues that are minor, but some of these have caused disputes in the field. It is also missing specific direction on one risk area – slash on the cutover.

[66] https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf p 287.
[67] See section 5.3 for more analysis of slash risks and slash risk management: https://www.mpi.govt.nz/dmsdocument/44914-Report-on-the-Year-One-Review-of-the-National-Environmental-Standards-for-Plantation-Forestry

6.3.2 Proposals to manage slash

Table 4 sets out our proposed amendments to the regulations, to improve clarity and direction for foresters and council compliance staff.

Table 4: Proposed amendments to NES-PF regulations on slash management

Issue		NES-PF regulation	Findings	Intent/Proposed amendment
D1a	Regulation 66 does not mention slash management.	Regulation 66 sets out the requirement to produce a harvest plan, but does not specifically refer to slash management, though this is required through schedule 3(5).	Including reference to slash management provisions in regulation 66 would emphasise the importance of slash management requirements in the harvest plan and reduce potential for misunderstanding. This will not change regulatory or operational requirements.	Ensure the requirement to include slash management in harvest plans is evident in the main body of the regulations, not just the schedules. This could be added to 66(2)a).
D1b	The term 'stable ground' is ambiguous in the context of regulation 69(1).	Regulation 69(1) says slash from harvesting must be placed on stable ground.	This provision was intended to require that slash generated during log processing at a landing (also known as a skid site) is placed on stable ground, to ensure it does not cause or contribute to slope failure. As currently drafted, this provision could apply to any slash anywhere in the forest. This exposes harvesters to legal risk if they leave any slash of any size on 'unstable' ground in any ESC zone. The term 'stable' is ambiguous in this context, and the science on slope stability shows that under the 'right' circumstances any ground can fail. Clarifying this wording will remove an untenable regulatory situation.	Amend regulation 69(1) to clarify that it applies to log-processing slash that has been produced at or on a landing site. This would include slash stored on benches below the landing - these need to be engineered for stability.
D1c	Regulation 69(2) is limited to slash on the edge of landing sites.	Regulation 69(2) Slash from harvesting that is on the edge of landing sites must be managed to avoid the collapse of slash piles.	It is not clear whether 'edge' refers to slash on the landing, or slash below the landing. All slash should be managed to avoid the collapse of slash piles, so this seems to make a distinction that may be misleading. Wording should be unambiguous, to ensure that operators and compliance officers understand where action is required to manage risk. Piling slash in areas outside the landing site is neither common practice nor safe without engineering works to secure the ground under it.	Amend regulation 69(2) to clarify that it applies to all slash piles on or around landings.
D1d	Schedule 3(5)(c) is ambiguous because it refers to clause 3(3).	Schedule 3(5)(c) [The harvest plan must include] the management practices that will be used to avoid, remedy, **or mitigate risks due to forest harvesting on features identified under clause 3(3) and mapped**, including the slash management and procedures for—[matters i-iv]	Schedule 3(5) sets out requirements for harvest plans, including managing slash. 5(c) is drafted in such a way that it mixes requirements for protecting identified sites (such as SNAs) mapped under 3(3) (which may be subject to a number of risks), with management of slash in general. A narrow interpretation of this provision may be to the detriment of broader slash management requirements. Safe slash management is sufficiently important that there should be no doubt that it must be managed for all risks identified in the regulations, not only for features that must be protected during the harvesting operation.	Amend Schedule 3(5) to clarify that management of slash for the whole site is required in the management plan, including as required to protect features identified in 3(3).

PART D: ENABLING FORESTERS AND COUNCILS TO BETTER MANAGE THE ENVIRONMENTAL EFFECTS OF FORESTRY

Issue		NES-PF regulation	Findings	Intent/Proposed amendment
D1e	Regulation 69 does not set a management standard for slash on the cutover, to address risks of it causing slope failure or mobilising.	Schedule 3(5)(c)(iv) requires measures to ensure that slash is not mobilised in heavy rain (5% AEP or greater) and contingency measures for such movement. This would include slash on the cutover but it does not specifically mention it. Regulation 69 does not set a requirement for this, so it may not be clear that this must be considered.	Slash is often safely left on the cutover, where it remains while a new crop grows around it. It is an important source of nutrients for the new crop. However, on steep slopes and those susceptible to mid-slope failure in the post-harvest period the weight of large amounts of slash may contribute to slope failure and/or mobilisation into waterways.[68] This will not apply to all slash on the cutover, but only to that which would be mobilised in heavy rain.	Amend regulations 66 and 69 to clarify that slash on the cutover must be managed to ensure it is not mobilised in heavy rainfall (5% AEP or greater) and to avoid slope failure.

Q D5 Do you agree with each of the proposed amendments to the NES-PF in relation to slash regulations, set out in Table 4? Y/N If not, please identify any you disagree with by referencing the number in the left-hand column of Table 4 and explain why you disagree.

6.4 How can better information make a difference?

Some slash risks are reasonably within a forest manager's control, but others are not. These include inherent properties of the site, such as underlying geology, soil, climate, slope steepness and shape. Risks also include variables such as wind velocity or direction, which creates windthrown timber that may move during heavy rain.

Site-specific management practices can, however, reduce risk and improve outcomes. These can range from improvements in normal practice to significant changes. Examples of the former might be using logging equipment that reduces stem breakage, company rules that require slash removal, contractor focus on slash-riskier locations, and less slash build-up at landings. Examples of significant changes could include leaving trees in the riparian margins, replanting in different species, and different approaches to harvest coup size and method.

[68] Forest Practice Guide 6.2 Managing Cut-over slash on high-risk slopes. https://docs.nzfoa.org.nz/site/assets/files/1510/6-2_harvest-slash_managing-cut-over-slash-on-high-risk-slopes-2-0.pdf

Is there enough information to apply the regulation effectively?

Public information about managing slash on site is not widely available. When the NES-PF was developed, the Ministry for Primary Industries developed a set of forest practice guides with practical information for foresters and councils on managing some of the key risks in the NES-PF. Since 2018 the New Zealand

Forest Owners Association (NZFOA) has hosted the guides and undertaken to update them as required.[69] These are widely used in the forestry sector, but may not be as well known in councils.

The guides set out good forestry practices to address the requirements of the regulations and specific risks. They explain where and when to use them, design criteria, operational controls and maintenance considerations. The New Zealand Forest Road Engineering Manual 2020[70] has in-depth guidance on matters that also relate to slash management (eg, planning for landings, road and landing construction, and erosion, sediment and slash control structures). Most forestry companies have their own methods to assess slash risk, as part of their business planning, though these are not publicly available.

These materials are very useful for those with forestry training or experience, as a reminder of the risks and hazards to be aware of in managing slash. However, they do not provide the underlying knowledge required in complex situations to assess risk well, or to determine the most appropriate response.

These materials are very useful for those with forestry training or experience, as a reminder of the risks and hazards to be aware of in managing slash. However, they do not provide the underlying knowledge required in complex situations to assess risk well, or to determine the most appropriate response.

A common request from council compliance, monitoring and enforcement (CME) officers is for more information about slash management. This includes an understanding of the circumstances in which slash should be removed from waterways to reduce ecological and downstream risks, and when doing so would be unsafe for forestry workers.[71] Managing slash must be done in such a way that foresters do not risk their safety, and forestry companies must comply with this under the Health and Safety at Work Act 2015. Foresters and council officers need to understand how to determine when safety considerations on-site override the environmental considerations in the NES-PF, including the safety of downstream communities.

Te Uru Rākau – New Zealand Forest Service has had some advice on tools for slash risk assessment, but we are seeking greater understanding of the ways in which these could assist council staff and foresters with limited access to advice. This includes consent conditions relating to slash, and on-site assessment requirements.

Q D6 What information about slash risk and slash management do you or your organisation require? What is the best way for you to receive this information?

How should 5 percent annual exceedance probability be interpreted on site?

How should 5 percent annual exceedance probability be interpreted on site?

Regulations 20 and 69 set out requirements to “not deposit” or move slash that would be covered by water during a 5 per cent annual exceedance probability (AEP)[72] event. The intent is that slash is not left where it could mobilise in a rainfall event with a 1 in 20 annual probability of occurrence. As the climate changes we expect to see more high-impact storms in some parts of New Zealand.

These requirements may be interpreted well on the ground by foresters and enforcement officers with hydrological training or extensive practical experience, or where modelling is available that is widely agreed and understood. However, applying them to a specific site requires a degree of judgement or familiarity with the site that may not be available. This could cause uncertainty about which areas to clear, and create disputes when high rainfall causes damage.

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[69] https://docs.nzfoa.org.nz/forest-practice-guides/

[70] https://www.nzfoa.org.nz/resources/file-libraries-resources/transport-and-roading/843-nz-forest-road-engineering-manual-2020/file

[71] Regulation 69(4) sets out conditions under which slash should be removed from waterways and includes the words ‘unless to do so would be unsafe’. This wording has led to disputes over interpretation.

[72] Annual exceedance probability refers to the probability of a flood occurring in any year, expressed as a percentage. A 5% AEP event has a 5% chance of occurring in any one year and is also known as a 1 in 20 year flood. Some councils use average recurrence intervals (ARI) as a measure of the number of years predicted to pass before an event of a given magnitude occurs. For example, a 20-year ARI would on average happen every 20 years.

Te Uru Rākau – New Zealand Forest Service is seeking further views and information on measures that are, or can be used on site, to the mutual satisfaction of foresters and CME staff.

Q D7 What tools or information do you use to assess operational requirements for the 5 per cent annual exceedance probability (AEP) requirement?

6.5 Initial alignment with NES-Freshwater

6.5.1 Context

The NES-PF came into force in 2018 to regulate plantation forestry and associated activities under the RMA. The NES-Freshwater[73] came into force in 2020, to regulate activities in or around freshwater. The National Policy Statement for Freshwater Management (NPS-FM) was amended in the same year, applying to freshwater management and receiving environments.

Although the two national environmental standards were created for different purposes, some alignment is required to ensure freshwater rules apply equally where circumstances are very similar. The NES-PF also needs to give effect to the NPS-FM. The resource management system is currently being reformed and the exact nature of the national planning framework under the new system is yet to be finalised. However, looking ahead to a new, integrated national direction system we are taking this opportunity to consult on aligning provisions in the NES-PF that are similar to those in the NES-Freshwater. At this stage, the alignment is limited to straightforward changes that require little additional information and will avoid significant redrafting of the NES-PF. We wish to avoid additional administrative burdens for councils and foresters where environmental benefit is minor (for example, needing to redraft internal guidance and processes).

Alignment still needs to be considered in other areas, such as culverts, sediment, wetlands and further definitions. These are being considered for later alignment through the national planning framework, and will require consultation.

6.5.2 Proposals to initially align the NES-PF with the NES-Freshwater

Table 5 shows the alignment proposals.

[73] Resource Management (National Environmental Standards for Freshwater) Regulations 2020: https://www.legislation.govt.nz/regulation/public/2020/0174/latest/LMS364099.html#LMS364306

Table 5: Proposals to initially align the NES-PF with the NES-Freshwater

Issue		NES-PF description	Findings	Intent/Proposed amendment
FISH PASSAGE				
D2a	Fish passage on river crossings	Regulation 40(1) has provisions relating to where fish passage may be restricted: *River crossings must provide for the upstream and downstream passage of fish in rivers, except where the relevant statutory fisheries manager advises the relevant regional council in writing that to provide for the passage of fish would have an adverse effect on the fish population upstream of the river crossing.*	The NPS-FM requires councils to change their plans to identify which species of fish need to be protected, and which waterways must not allow fish passage, to prevent undesirable species from accessing higher reaches of the waterway. The NES-PF can be readily aligned with this requirement so that fish passage is only required on new and existing river crossings where councils have not restricted fish passage.	Add sentence to regulation 40(1) to state: *...river crossing, or where the regional council has determined that fish passage must be restricted*
D2b	Culvert depth	Regulation 46(1)(f) specifies that: *at installation, the culvert invert must be located so that at least 20% of the culvert's diameter is below the riverbed level*	The NES-F has a different culvert invert in regulation 70(2)(e): *The culvert must be open-bottomed or its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed.* The NES-PF could adopt the NES-F culvert invert of 25%, though feedback should be sought on any problems with this approach	Amend regulation 46(1)(f) to state that: *at installation, the culvert invert must be located so that at least 25% of the Culvert's diameter is below the riverbed level*
DEFINITION OF SEDIMENT CONTROL MEASURES				
D3a	Sediment control measures	'Sediment control measures' are defined as: *structures or measures to slow or stop water with sediment in it, so that the sediment will drop out of suspension before the water from the site reaches a water body.*	The definitions for sediment control measures differ between the NES-PF and NES-F. We have not identified any issue with aligning the NES-PF to the NES-F definition of sediment control measures. Aligning will aid consistency in national direction over the longer term.	Amend the definition of sediment control measures in the NES-PF to be the same as the NES-F: *sediment control measures means measures or structures that do 1 or more of the following:* *(a) stop sediment from being washed away from its source:* *(b) slow or stop water with sediment in it so that the sediment drops out of suspension before the water reaches a water body:*

Issue		NES-PF description	Findings	Intent/Proposed amendment
				(c) divert the flow of water so that it does not become contaminated with sediment.
WETLANDS – MACHINERY AND VEHICLES				
D4a	Vehicle use in/around wetlands	The NES-PF states through regulation 68(4) that: *(4) Harvesting machinery must not be operated, except where subclause (5) applies,—* *(a) within 5 m of—* *(ii) a wetland larger than 0.25 ha* And regulation 68(5) that: *(5) Harvesting machinery may be operated in the setbacks required by subclause (4) only if—* *(a) any disturbance to the water body from the machinery is minimised; and* *(b) the harvest machinery is being operated—* *(i) at water body crossing points; or* *(ii) where slash removal is necessary; or* *(iii) where essential for directional felling in a chosen direction or extraction of trees from within the setbacks in subclause (4).*	The NES-F sets general conditions for the use of vehicles, machinery, equipment and materials in regulation 55(12). The NES-PF does not permit vehicles to operate in wetlands or the setbacks from wetlands. There are two exceptions: • regulation 11(5) requires the eradication of wilding conifers every 5 years if they establish in wetlands, which may involve minor use of machinery; • regulation 68(5)(b)(iii) allows machinery to operate in the setback from the wetland for specific purposes. While the regulations restrict most activity with vehicles in wetlands, given the value of wetlands it seems prudent to ensure that any use of machinery is managed in line with the requirements of the NES-F, where applicable. We note that regulation 55(12)(d) includes reference to refuelling near a wetland. Regulation 104 of the NES-PF sets requirements for refuelling near water that are more restrictive than the NES-F.	Amend the NES-PF to include text similar to the NES-F: *The general conditions on the use of vehicles, machinery, equipment, and materials around wetlands are as follows:* *(a) machinery, vehicles, and equipment used for the activity must be cleaned before entering any natural wetland (to avoid introducing pests, unwanted organisms, or exotic plants); and* *(b) machinery that is used for the activity must sit outside a natural wetland, unless it is necessary for the machinery to enter the natural wetland to achieve the purpose of the activity; and* *(c) if machinery or vehicles enter any natural wetland, they must be modified or supported to prevent them from damaging the natural wetland (for example, by widening the tracks of track-driven vehicles or using platforms for machinery to sit on); and* *(d) the mixing of construction materials, and the refuelling and maintenance of vehicles, machinery, and equipment, must be done outside a 10 m setback from any natural wetland.*

Q D8 Do you agree with each of the proposed changes to align the NES-PF with the NES-Freshwater, set out in Table 5? Y/N If not, please identify any you disagree with by referencing the number in the left-hand column of Table 5 and explain why you disagree.

Q D9 Do you anticipate any unintended consequences from this proposal to align parts of the NES-PF with the NES-Freshwater?

Update on Fish Spawning Indicator

The Fish Spawning Indicator (FSI) places species into two groups (A and B), and restricts activities in rivers and wetlands based on whether the FSI indicates a species is present. The FSI was intended to be updated regularly, as our data on fish distribution and spawning timings changeover time. These updates have been infrequent to date.

Our understanding of fish populations and presence has changed since the FSI was established. This means we expect to make a more thorough update. We anticipate:

- Reviewing the species in Group A and Group B. New fish species have been discovered or described since the FSI was gazetted, and the New Zealand Threat Classification for Freshwater Fish is due for review in 2022. We do not intend to make changes to the groups unless a species is newly described or its threat status or qualifiers change.
- Updating predicted fish distribution where there is no observed data from the New Zealand Freshwater Fish database. The original modelling used a 50 per cent likelihood of presence as the threshold for inclusion in the FSI. Distribution modelling has improved over the last five years, and methods have changed. If we are unable to replicate the modelling in a similar way for a future update, we will calibrate any fish presence modelling in the FSI to show a fish as 'present' for the purpose of the NES-PF, if modelling indicates that it is *more likely to be present than not.* This ensures that modelled distributions provide roughly the same degree of protection, even if the modelling method changes.

The agencies administering the NES-PF will continue to update the FSI where needed, to protect threatened or at risk species.

6.6 Alignment with new national direction

Several new national directions that have been consulted on have some overlap with the NES-PF. These may come into force during this consultation period, or between when this consultation closes and any amendments are made to the NES-PF.

These include:

- National Policy Statement for Highly Productive Land
- National Policy Statement for Indigenous Biodiversity, which recently went through an exposure draft process
- potential sets of amendments to several NES, including changes to the NES-Freshwater and the NES-Drinking Water, both of which already have a relationship to the NES-PF.

The NES-PF already provides for these matters in some form eg, provisions for significant natural areas would relate to the NPS-IB, as consulted on.

We will consider how to align the NES-PF with these national directions when the NES-PF moves into the National Planning Framework, unless there are particular matters that need to be addressed sooner.

6.7 Operational and technical issues

We have identified a number of operational and technical issues with the regulations since they came into force. These relate to technical forestry practice or specific wording of the regulations, which does not give effect to the intent of the regulations. These have been brought to our attention by a range of users, but this is the first time we have been able to consult publicly.

Your feedback

Based on what we have heard and on our analysis, we have proposed amendments that would give effect to our findings. We seek your feedback on these proposals including further input in the form of evidence of the problem (or lack of one), improved proposals, or reasons why we should not pursue the proposal.

We are also taking the opportunity to hear feedback on any other operational or technical issue that we have not addressed that you consider require attention, amendment or greater guidance from the Government. These suggestions may require further public consultation, though amendments with only a minor effect, or that correct errors or make similar technical alterations, may be made at the discretion of the Minister for the Environment.[74]

We are also taking the opportunity to hear feedback on any other operational or technical issue that we have not addressed that you consider require attention, amendment or greater guidance from the Government. These suggestions may require further public consultation, though amendments with only a minor effect, or that correct errors or make similar technical alterations, may be made at the discretion of the Minister for the Environment.[75]

[74] Section 44(3) of the Resource Management Act.
[75] Section 44(3) of the Resource Management Act.

Table 6: Proposals to address operational and technical issues

Issue		Description	Finding	Proposed amendments to NES-PF
RIVER CROSSINGS				
D5a	Ford – the definition and intent of this term is not clear in the regulations	A ford is a type of river crossing managed under the NES-PF. A river crossing is defined in the NES-PF as *inter alia* "a structure that is required for the operation of a plantation forest and provides for vehicles or machinery to cross over a water body". However, the definition of a ford does not include the word 'structure': **ford** "means a hard surface on the bed of a river (that is permanently or frequently overtopped by water) that allows the crossing of a river by machinery or vehicles." **Structure** takes the definition in the RMA: "structure means any building, equipment, device, or other facility made by people and which is fixed to land; and includes any raft." NES-PF Guidance says a ford can be a graded river bed or naturally rocky bed, however this is at odds with the definition of a structure.	There has been some confusion about whether fords include natural crossings in rivers that have a hard natural surface, or whether it must include a manmade structure such as a concrete pad. The intent of the regulations is that a ford is classed as a river crossing, which is a manmade structure. Amendments should be made to clarify this, though there is no intent to take a more permissive approach to the construction or use of fords.	Clarify that the definition of a 'ford' includes the word structure. Consequent changes to the NES-PF Guidance will be required.
D5b	Fords – Uncertainty about interaction between construction regulations and discharge regulations	It is not clear how the NES-PF provisions on fords interact: Regulation 37 sets the permitted activity conditions for constructing, using, maintaining or removing a river crossing as long as a range of other conditions are complied with. Regulation 46(4) sets those conditions for fords and regulation 46(4)(b) sets the conditions for use.[76] Resource consent is required if that provision cannot be satisfied.	Regulation 46(4)(b) sets out the conditions for use of a 'ford river crossing', while regulation 97(6)(a) is to address the effects of crossing a 'wetted riverbed'. Regulation 97(6)(a) is a small exemption to enable single crossings of forestry equipment or vehicles such as silviculture crews in and out of a forest. This exemption would seem to imply that any other crossing of the wetted riverbed is not covered by this regulation.	Amend the regulations to clarify that vehicles fording a wetted riverbed by up to 20 axle movements per day is a permitted activity, and that this refers to the action of 'fording' the (natural) wetted riverbed.

[76] 46(4)(b) use of the ford must not cause a conspicuous change in colour or visual clarity beyond a 100 m mixing zone downstream of the ford for more than 30 consecutive minutes after use of the ford.

		Regulation 97 provides discharge conditions across a range of activities. Regulation 97(6)(a) says that vehicles using a ford to cross the wetted riverbed at a rate of up to 20 axle movements per day is not to be regarded as a disturbance of the bed or vegetation in the bed of a perennial river. This use of the term 'ford', in a way that seems to contradict regulation 46(4)(b), has caused some uncertainty over interpretation.	It is not the intention of the NES-PF to permit multiple crossings of a wetted riverbed by many forestry vehicles. Crossings of more than 20 axle movements per day would be up to regional councils to manage.	
D5c	The use of existing fords is permitted under regulation 37(1)(d), but they are explicitly excluded from the definition of existing river crossings in the interpretation.	Existing river crossing is defined in the regulations, but exempt fords and temporary river crossings from the definition. Regulation 37(3) allows the use of existing river crossings, and regulation 37(1)(d) permits the construction, use, maintenance or removal of fords. The intent of regulation 37(3) was to ensure that existing crossings were not unnecessarily removed when the NES-PF came into force. There was no intent to constrain the use of existing fords during development of the regulations.	Existing fords should be included in the category of existing crossings. No case has been made for their removal and removing them could cause greater environmental effects than they currently generate. The exemption of fords from the definition of existing river crossings has caused uncertainty for users of the regulations. Intent should be clarified. The use of fords still requires that environmental effects be managed through regulations 39-42.	Amend the definition of '*existing river crossing*' in regulation 3 to remove the exclusion of fords.
D5d	Temporary structures for river crossings	The NES-PF permits the use of temporary river crossings for up to 2 months. Engineered structures that can be placed in rivers and removed (for example, Naseby, Slipstream[77] and Blaze-It crossings) are used in some regions as an alternative to a permanent river crossing, particularly as a replacement for a permanent ford. This is a built structure that allows fish passage and can be placed in the river for an extended period (e.g. to carry laden logging trucks) and removed when no longer required for regular use. These crossings could be classed as a temporary river crossing, and permitted, but generally their use will be required for longer than 2 months which	A temporary engineered structure will sometimes be the best environmental option for forestry vehicles crossing rivers. At least one regional council has permitted this type of river crossing. Wider views on including this type of crossing in the regulations are required, particularly from river engineers and ecologists. Matters that must be considered include appropriate placement, term of use, maintenance conditions, fish passage, and consent status.	Amend the river crossing regulations to enable the use of an engineered structure for crossing a river that may be placed in the bed of a river for up to 2 years; AND Seek feedback on the conditions under which this activity may be permitted, and the conditions under which resource consent is required; AND *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation*.

[77] A slipstream crossing can be seen at https://www.nzfoa.org.nz/news/foresty-news/1546-040716foanews-2

		is the permitted activity limit for temporary river crossings.		
D5e	Dual culverts are not covered by the river crossing regulations	Regulation 46 sets out the permitted activity conditions specific to various classes of river crossings. It includes single culverts and battery culverts. Installation of two adjacent culverts is not covered. In some cases it may be desirable to install a double culvert, for example, 2 x 1200mm culverts. Although a single culvert may be 3.5m above the river at its highest point, a battery culvert must not exceed 800mm above the river. This means there is no permitted activity rule for larger double culverts, where they don't meet the battery culvert height limit of 800mm.	Single and battery culvert river crossings allow the river to pass under the bridge. The regulations include requirements for ensuring they provide adequate capacity under flood conditions. The regulations have not anticipated the use of double culverts that may be larger than 800mm (a battery culvert may use one 1200mm culvert but not two). Information should be sought on the practical need for including double culverts, along with advice from regional councils about a permitted activity threshold.	Seek feedback on the practical need for permitting double culverts; the permitted activity conditions that should apply to their installation; and the appropriate threshold for resource consent; AND *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation.*
D5f	Flood flow estimation methods incorporated by reference need to be updated so they represent the principal estimation methods recognised by foresters and councils.	Regulation 45 requires flood flow estimations to be calculated for river crossings so they are built to withstand flood conditions. This means knowing the expected flood flow (design peak discharge) and the capacity for the crossing to pass the designed flood flow. The NES-PF specifies the methods for calculating flood flows, and incorporates these by reference in Schedule 2 of the regulations. Specifying the methods ensures that calculations use well-accepted, tested methods to ensure river crossings are safe in- situ and in relation to the downstream environment and communities. When the NES-PF was gazetted in 2017 several flood flow estimation methods were in use, and were incorporated. Since then, improved methods have been published.	Te Uru Rākau – New Zealand Forest Service has received feedback from users of the regulations and NIWA that *Henderson and Collins 2018* is the latest publicly available national level flood study which is an advancement over *McKerchar and Pearson (1989)* and *Technical Memorandum 61* (TM61) https://niwa.co.nz/sites/niwa.co.nz/files/2018177CH-Flood-Frequency-Final-Report-Part2-NIWA.pdf This allows the user to obtain an estimate for a range of flood flows of most rivers and streams in New Zealand. It uses its own digital terrain model that supports their river environment classification (REC, version 1).	Amend Schedule 2 by removing items 3 and 4 and inserting Henderson R; Collins D; Doyle M; Watson J (2018): *Regional Flood Estimation Tool for New Zealand Part 2.* Add the most recent URL link to this tool at time of drafting.
D5g	Culvert diameter specifications for flow rate may	Clauses 31(4) and 46(1)(c) define required culvert size by internal diameter. This has reportedly restricted product choice as culverts that would allow the required flow do not meet the	Regulation 46 has a mix of technical and performance-based measures; regulation 31 is only a technical standard. The technical measure sets culvert diameter as the permitted activity	Amend regulation 31(4)(b) to include 375mm internal diameter and 400mm outside diameter culverts;

	restrict product choice.	specifications, due to the wording of the regulations. It has been suggested that the specifications be changed from a minimum inner diameter to a minimum flow rate, as the diameter of a culvert pipe indicates its ability to carry flow. Regulation 31(4)(a) specifies a 325mm internal diameter, but culverts of this size are not commonly available. This could make this specification redundant and confusing. Regulation 46(1)(c) is unclear as it does not specify whether the diameter is internal or external.	threshold. A manufacturer or supplier's culvert either meets or does not meet the diameter. Given the complications of measuring flow rates, and the fact the calculations must be done on a case-by-case basis, this is deemed too complicated for a permitted activity standard, though it could be used to meet a consent condition. Engineering advice is that changes to the regulations could accommodate external diameters that would deliver the same flow but allow greater product choice.	AND Amend regulation 46(1)(c) to include both a 450mm internal diameter or a 500mm outside diameter culvert; AND Seek feedback on whether regulation 31(4)(a) should be amended to provide any clearer direction, given the common availability of culvert products.
TREATY SETTLEMENT AREAS				
D6a	The matters of discretion relating to outstanding water bodies do not allow for consideration of Treaty settlement areas	An outstanding natural water body under the NES-PF may include Treaty settlement areas, but the NES-PF does not allow discretion for them. Matters of discretion for a consent for doing something within or adjacent to an outstanding natural water body in the NES-PF do not allow a council discretion to consider the settlement legislation and values, but they must still apply Part 2 of the RMA.	Where resource consent is required in relation to an outstanding freshwater body, and Treaty Settlement legislation includes rights over outstanding natural water bodies, the NES-PF should enable councils to give effect to those rights.	Amend regulations relating to outstanding freshwater bodies to ensure they give effect to Treaty settlement areas.
NOTICE PERIODS				
Notice periods may be inefficient and in some cases insufficiently calibrated for risk Permitted activity conditions in the NES-PF require foresters to give notice to regional councils and territorial authorities of the intended start dates of certain plantation forestry activities. The intent is to make councils aware of key forestry work in their area, and enable them to undertake risk-based compliance monitoring where appropriate. Five permitted activities require notice periods, setting out the location of the activity and the start and finish dates. There are also specific information requirements. In some cases notice is proving more complex than intended, increasing the costs for both foresters and councils, without noticeably improving environmental outcomes. We have identified 5 potential amendments. The proposed change to afforestation notifications in regulations 10 and 11(4) is set out in the section on wilding conifer control.				
D7a	Notice periods are the same in low- and high-risk zones	Many environmental controls in the regulations are based on erosion risk, as defined by the erosion susceptibility classification. Greater controls are required in high-risk zones. However, notice periods are the same for all zones. This means	Foresters and councils have told us that notifications can be a heavy compliance burden. Some foresters have hired new staff to keep up with the administrative requirements of the NES-PF, and some councils find it difficult (or impossible) to respond to notifications in a	Notice times should focus effort where councils need to be aware of forestry work, with time to check plans and initiate monitoring if necessary. **We seek your feedback on where notice periods should remain or change.**

		councils will receive a large number of notifications for low-risk activities, and foresters must provide these and juggle work around the need to harvest. This has placed a new (and in some cases onerous) burden on foresters and councils to provide and process documentation, and wait to begin jobs that pose very little risk to the environment. In particular, activities in green and yellow ESC zones are generally low risk.	meaningful way. This is more likely with district councils, who have few responsibilities under the regulations, and principally need to ensure setbacks are correct through afforestation notifications. A number of forestry companies have expressed concern about delays in moving crews while they wait out a notice period, sometimes losing jobs or standing down crews. This is a significant expense, with crew costs being upwards of $10,000 per day. More relevant notice periods, with requirements that better reflect risk, will improve the process for councils and forest companies.	1. Areas where particular risks should be managed, and notice periods should remain as they are. • Earthworks, quarrying and harvesting in red and orange zones. • River crossings during fish spawning periods. • Activities beside SNAs. • Activities upstream of sensitive receiving fresh or coastal waters. 2. The area where risks are low and notice periods could be reduced or waived: • Earthworks, quarrying and harvesting in green and yellow zones. *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation.*
D7b	Notice periods for earthworks regulation 25 – emergency situations	Regulation 25 requires notification between 20 and 60 working days before earthworks begin. There is a minimum notice period of 2 days to enable salvage operations. A salvage operation is defined as the urgent extraction of trees that have been damaged by fire or wind throw. This recognises the need for rapid salvage after fire or storms to a) ensure safety and b) salvage value in a natural disaster.	The provision for emergency works may not be sufficient for the types of emergencies that may occur. Regulation 64(b) enables a shorter notice period (2 days) where harvesting relates to salvage. However, notice provisions have caused issues during two recent events: • During the Pigeon Valley fire in 2019, crews needed to relocate harvesting rapidly out of unsafe areas, but had to wait for the notice period (no less than 20 working days); • In early 2020, COVID-19 disrupted log exports, and foresters needed flexibility to move crews, to harvest forests that could fill other markets (for example, local sawmills). This was sometimes held up due to notification requirements. Some crews had to be stood down despite the efforts of companies to keep people working.	Amend regulations 25(2) and 64(2) to enable councils to waive the minimum 20-day notice period when unforeseen circumstances, such as fire, and economic disruption that triggers force majeure, require foresters to start an operation sooner than 20 working days after notice. This amendment would not include waiving the requirements to meet all permitted activity conditions for that activity. It would not require councils to waive the full notice period.

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D7c	Notice periods – joint notifications for contemporaneous activities	The regulations require notifications for earthworks, harvesting and river crossings. In many cases these will be planned as part of a harvest. Council practice varies - some councils allow joint notifications but others require separate notifications. It would be more efficient for foresters and more useful for councils to receive a single notification setting out the activities.	The number of notifications received by councils can be very high, and councils have limited ability to respond. The purpose of harvest notifications is to ensure that councils are aware of harvest activities and can monitor these if required. This is generally achieved by understanding and responding to the harvest work as a whole.	Amend the regulations to clarify that where more than one activity is being notified at the same time for the same forest, a joint notification is allowed.
D7d	Notice periods regulation 64(2)(c)– the frequency of requirements if activity is undertaken continuously	Regulation 64(2)(c) allows forestry companies to notify a council annually of its harvest work if this is an 'ongoing harvesting operation'. This applies to large forests with long-term operations. Practice varies - some councils accept annual notifications while others require individual notifications for any harvest area that is not contiguous in the same forest.	The regulations do not specify what constitutes a harvest area, so it is not clear which regulations councils are relying on if they will not accept annual notifications. Schedule 3(2) requires that harvest plans include a map showing the harvest area boundary, so this should define the area. Schedule 3(5) says the plan must include the timing, duration, intensity and any proposed staging of the harvest. Providing individual notifications for particular areas within the mapped area, where timing is already provided, can be an unnecessary administrative burden for foresters. Where a harvest is ongoing and risk factors have not changed, a pro forma notification does not add value to a council's operations.	**We seek your feedback on where notification periods should remain or change.** In particular: • Whether councils are accepting harvest plans covering large areas which may include areas which are not contiguous. • If councils will not accept annual plans, which environmental risks they need to manage with more regular notification (and the regulation they are relying on to require that). • What practical solutions exist to manage differing expectations on harvest notification. *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation.*
TRAFFIC MANAGEMENT				
D8a	A traffic management condition for the activity of forestry quarrying has been confusing.	Regulation 57 sets requirements for forestry quarry vehicles carrying quarry materials on public roads. The permitted activities were intended to allow for transport of material between related forestry operations that might cross district roads. However, it is the only regulation in the NES-PF that controls vehicle movements on public roads. It is not clear why this one aspect of road use by forestry vehicles is regulated and raises equity issues for	Regulation 57 carves out a small part of forestry vehicle use on public roads. Reports are that it is unclear what can be reasonably expected in consent conditions if one cannot comply with regulation 57(c). causes uncertainty.. The effects of using public roads for forest quarrying are the same as for commercial quarrying. Consent conditions should not unduly disadvantage forestry quarrying. Removing this provision will	Amend regulation 57 by removing it.

		forestry, compared to other commercial enterprises using public roads.	clarify that district councils control district road use equitably for all users.	
INDIGENOUS VEGETATION AND SNAs				
D9a	Meaning of stringency for SNAs is changed by the NPS-IB.	Regulation 6(2)(b) enables councils to make more stringent rules than the NES-PF, if the rule provides for the protection of significant natural areas (SNAs). When the NES-PF was gazetted, SNAs were identified by district councils under section 6(c) of the RMA according to locally determined criteria. The NPS-IB is introducing new criteria for significance and has specific policies for plantation forestry.	Keeping the current stringency provision for SNAs in the NES-PF means that councils can make more stringent rules than the NES-PF, potentially including any productive forest identified under the NPS-IB. The NPS-IB sets a specific management process where productive forest has been identified as an SNA. This could result in competing or doubled-up management requirements through both the NES-PF and the NPS-IB. This would be confusing and potentially burdensome for councils and foresters.	Amend regulation 6(2)(b) so it applies only to SNAs outside the productive area of the forest. Consequential amendments may be required to other parts of the regulations. **Note that this amendment is subject to the NPS-IB coming into effect.*
D9b	Definition of indigenous vegetation may be unclear.	The NPS-IB will introduce a different definition of indigenous vegetation from the NES-PF. It is not clear whether the term 'predominantly' in the NES-PF definition refers to composition, cover or something else. Therefore it may not be sufficiently enforceable. **Draft NPS-IB: indigenous vegetation** means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district in which that area is located. **NES-PF: indigenous vegetation** means vegetation that predominantly occurs naturally in New Zealand or that arrived without human assistance. The NES-PF definition was taken from the definition of 'indigenous' in the Forests Act 1949.	Adopting the NPS-IB definition would increase consistency between national direction instruments, and clarify what type of vegetation is indigenous, without considering composition or cover. For plantation forestry this may place greater reliance on rules to clarify how to manage composition and cover. Forestry occurs at a landscape scale and vegetation assemblages are generally the appropriate scale of vegetation to consider, not the individual plants in the NPS-IB definition. The definition or rules should reflect this. Requiring identification of vegetation based on its district-level indigeneity would require a high level of ecological knowledge which may not be common. However, it does add to the intent of wider protection for significant indigenous vegetation, which is closely linked to its natural range.	Consult on amending the definition of 'indigenous vegetation' in the NES-PF to duplicate that in the NPS-IB: **Indigenous vegetation** means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district in which that area is located. **We seek your feedback on any practical and operational issues this would raise for councils and foresters, including the specific references to 'plants' or 'ecological districts'.** **Note that this amendment is subject to the NPS-IB coming into effect ahead of amendments to the NES-PF.*

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D9c	Definition of vegetation clearance may be unclear.	In the NES-PF **Vegetation clearance** (a) means the disturbance, cutting, burning, clearing, damaging, destruction or removal of vegetation that is not a plantation forest tree; but (b) does not include any activity undertaken in relation to a plantation forest tree. Doubt has been raised about the wording of part (b) which may be read as enabling any vegetation clearance as long as it is associated with any activity involving plantation trees, which could potentially cover most activities in a plantation forest.	The need for clause (b) is not clear and provides a potentially wide exemption. Regulations 93-94 set out specific regulations for managing indigenous vegetation within the plantation forestry property; regulation 95 does this for non-indigenous vegetation clearance. The definition of vegetation clearance should not enable vegetation clearance that is otherwise precluded by the regulations. Equally, plantation trees should be harvestable, and this will require some vegetation clearance.	We seek your feedback on the need for part (b) of the definition of vegetation clearance, and any negative consequences of amending or removing it. *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation.*
D9d	Definition of incidental damage (in relation to indigenous vegetation) may be unclear.	Regulation 93 sets out the permitted activity thresholds for clearing indigenous vegetation within and adjacent to the productive part of the forest.[78] The definition of clearance includes damage. Regulation 93(5) sets out three mutually exclusive elements of what is considered 'incidental damage'. Damage to adjacent vegetation can be unavoidable when felling trees in some situations. The intention is to specify a permitted level of damage. Regulation 93(5)(a) and (b) provide an ecosystem approach and a specific tree/stand measure respectively; regulation 93(5)(c) relates to SNAs. *In this regulation, incidental damage means—* *(a) damage where the ecosystem will recover to a state where, within 36 months of the damage occurring, it will be predominantly of the composition previously found at that location; or* *(c) if it occurs in a significant natural area, damage that—* *(i) does not significantly affect the values of that significant natural area; and*	Often areas of indigenous vegetation within or adjacent to plantation forests, including SNAs, have grown up after the forest or (as is often the case) are indigenous forest remnants that have been deliberately left at afforestation. Even with due care there will be instances where felling trees damages adjacent vegetation. Setting limits signals a need to exercise care and plan felling so it causes minimal damage. While there is a degree of subjectivity in regulation 93(5)(a) and (c), this is almost unavoidable in practical terms. The intent is to limit damage to indigenous vegetation, but ecosystems are complex, living systems and setting precise measures is very difficult. The alternative, requiring resource consent for incidental damage to native vegetation may be disproportional to the effect. Additional information should be sought on how foresters are complying with this regulation and any issues foresters or councils are having in applying it as a permitted activity.	We seek your feedback on whether the wording of regulations 93(5)(a) and (c) are causing issues for users, and the nature of those issues. We also seek your views on ways in which the definition of incidental damage could be less subjective while still achieving the intent of allowing minor damage to indigenous vegetation under limited circumstances . *Provide submitters on this provision with the opportunity to review any changes to the regulations as a result of consultation*

[78] https://www.legislation.govt.nz/regulation/public/2017/0174/latest/DLM7372178.html?search=sw_096be8ed818902bf_drinking_25_se&p=1

		(ii) allows the ecosystem to recover as specified in paragraph (a). Subclauses (a) and (c) have a degree of subjectivity, and it has been noted that this definition requires a degree of judgement not appropriate for a permitted activity.		
EROSION SUSCEPTIBILITY CLASSIFICATION[79]				
D10a	The process for remapping an ESC polygon is disproportionate to the risk it seeks to manage	The ESC is a national tool mapped at a 1:50,000 scale. This means it may over- or under-risk erosion susceptibility at a forest/farm scale. a process was developed for remapping ESC polygons where a party disagreed with the ESC.[80] The process is time consuming and expensive for all parties and requires national level changes to the ESC to be gazetted.	Te Uru Rākau has received only one request for changes to the ESC, and that was not taken forward. We are aware of: • companies getting resource consent for land that is not red zone when mapped at a 1:10,000 scale, to avoid the time and expense of changing the ESC. ▪ councils agreeing that resource consent is not required once land is remapped by a suitably qualified mapper. ▪ councils and other interested parties disagreeing with ESC zoning in specific instances, and seeking broader changes to the ESC (though any party may apply for remapping). Enabling discretion to waive, or require, resource consent when land has been remapped by a suitably qualified mapper will maintain the intent of the ESC to indicate erosion risk while removing a burdensome process.	Amend the regulations to clarify that a council may waive resource consent, or require it if satisfied that remapping by a suitably qualified person indicates that at a 1:10,000 scale the land in question fits within a different erosion susceptibility zone to that recorded in the ESC.

[79] See Appendix F for more analysis relating to the Erosion Susceptibility Classification.
[80] https://www.mpi.govt.nz/dmsdocument/28542-Process-to-update-the-NES-PF-ESC-on-a-case-by-case-basis

SEDIMENT MANAGEMENT				
D11a	Some councils require separate discharge permits for activities the NES-PF permits.	Regulation 97(1) permits discharges associated with permitted forestry activities if all other activity conditions are complied with. The rest of the regulation sets specific restrictions on discharges. Foresters report that some councils accept activities in line with this requirement, while others require separate discharge permits. Under regulation 6(1)(a) councils may require this if they have a rule in their plan that is more stringent than the activity rules, or if they develop such a rule using the appropriate process and justify it through a section 32 evaluation report.	Regulation 97(1) permits discharges as long as other requirements are met. Councils should not be requiring separate discharge consents unless they can justify this through a more stringent rule. This does not appear to be a lack of clarity in the regulations, except insofar as regulation 97 is near the end of the regulations, and may not be apparent to users if they are not aware of it.	Amend the regulations to clarify that regulation 97(1) applies to permitted activity regulations for each activity, AND Te Uru Rākau – New Zealand Forest Service and Ministry for the Environment to develop clear guidance on applying discharge permits to permitted activities.
D11b	2-stage regulations to manage sediment.	The term 'reasonable mixing' occurs as part of five 2-stage regulations which set requirements for sediment. The intent of the regulations is to ensure that sedimentation of waterways does not cause downstream effects that are more than minor. These effects are described in regulations 26, 56(1), 65, 74(6) and 90. They require that 'after reasonable mixing', sediment does not cause specific downstream effects.[81] That is, they set out the effects that must be avoided, while allowing sediment to enter waterways. Feedback is that sometimes these regulations are read as meaning all sediment must be kept out of waterways. Regulation 31 also has two stages. It seeks to avoid the effects set out in regulation 31(1)(a and b). It can be misread to mean *all* soil and sediment must be stabilised or contained.	Guidance can clarify these 2-stage regulations, but users will still need to exercise judgement over their actions to reduce sediment (as required through other regulations), to avoid these effects. However, minor changes to clarify the intent of the regulations could ensure users do not think the regulations are defining 'reasonable mixing' or requiring 'all sediment to be stabilised or contained'.	Amend regulations 26, 31(1)(a and b), 56(1), 65, 74(6) and 90 as required to ensure their intent is clear.

[81] a) any conspicuous change in colour or visual clarity; b) the rendering of fresh water unsuitable for consumption by farm animals; c) any significant adverse effect on aquatic life. These effects are the same as those covered in section 70(1)(d, f and g) of the RMA. Effects 70(1)(c) and 70(1)(e) are not caused by sediment, so do not appear in these regulations.

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HEALTH & SAFETY				
D12a	The Health and Safety exemption for slash removal is unclear in regulations 20(2), 69(4) and Schedule 3(5)(c)(3)	The regulations have a range of exemptions for removing slash where 'to do so would be unsafe'. This has led to some questions over what constitutes 'unsafe'. 'Unsafe' is a subjective term, and operators are continually required to make judgement calls on site, and sometimes under pressing conditions. Worker safety is a crucial factor in decision-making so clarity is essential. The forestry sector has put considerable emphasis on worker safety in recent years, and in some instances environmental outcomes may be compromised by health and safety requirements.	Although greater clarity about the words "unless to do so would be unsafe" is desirable, in our view this cannot be achieved through a regulatory framework that applies to many different sites and forestry operations. The Health & Safety at Work Act requires the taking of reasonably practicable steps to eliminate risk or, if it can't be eliminated, to minimise it. The Forestry Industry Safety Council was established in response to the Independent Forestry Safety Review and delivers a wide programme of safety training and resources to the sector.	No amendments are proposed, but **we seek your feedback** on additional information or resources that could help foresters and councils make decisions balancing environmental outcomes with worker safety when managing slash.
CHARGING TO MONITOR PERMITTED ACTIVITIES				
D13a	The regulations about charging for monitoring permitted activities could clarify that there is no ability to charge for receiving notifications	The Year One review found that some councils thought the power to charge for permitted activities did not cover all associated costs, while foresters had a range of concerns about charging practices in some councils, including failure to apply a risk-based approach in some cases. Guidance on regulation 106 states: It is the on-site monitoring of earthworks, river crossings, forestry quarrying and harvesting that should be the focus of regulation 106. Monitoring the permitted activities in regulation 106 will not cover the time spent before the activity began, such as: • Reviewing management plans to determine whether they are complete or to better understand the activity (although reviewing may inform a more	The intent of the charging regulations[82] is to enable councils to charge for monitoring activities after a risk-based approach has been applied. Given the low risk of many forestry activities in lower-risk ESC zones, and the limited compliance resources of councils, it was not the intention that all forestry activities would be monitored (particularly those not monitored prior to the NES-PF coming into force). Proposed amendments to the NES-Freshwater (regulation 75 of the exposure draft) clarify what local authorities may and may not charge for monitoring. A similar clarification could apply to forestry activities. Some councils are concerned that they do not have the resources to monitor forestry activities	Amend the regulations to include a similar clarification to charging as proposed in the amendments to the NES-Freshwater: *For example, "a local authority must not charge to receive or review notification of intended permitted activity work (including earthworks, quarrying and harvest management plans)."*

[82] See chapter 3 https://www.mpi.govt.nz/dmsdocument/28092-Resource-Management-National-Environmental-Standards-for-Plantation-Forestry-Regulations-2017-consenting-and-compliance-guide

		focused and efficient site visit –see section 5.3 above), and • Determining the activity status of a plantation forestry activity (ie, checking documentation against NES-PF requirements and conditions).	appropriately, if they cannot charge to triage notifications. This complex issue bears continued scrutiny, but at present there is no evidence base to demonstrate that additional charging would improve environmental outcomes.	

Q D10 Do you agree with each of the proposed changes to the NES-PF to address operational and technical issues, set out in Table 6? Y/N If not, please identify any you disagree with by the number in the left-hand column of Table 6 and explain why you disagree.

In some cases we have not proposed an amendment but are seeking further information, as follows:

Q D11 **Temporary structures for river crossings (row D5d of Table 6)**: Do you agree that this type of river crossing could be permitted under certain conditions? Y/N What conditions should be applied to the crossing as a permitted activity?[83]

Q D12 **Dual culverts (row D5e of Table 6)**: Is there a need to include double culverts in the regulations? Y/N If so, what permitted activity conditions should apply to these river crossings?

Q D13 **Culvert diameters (row D5g of Table 6)**: Is a 325mm minimum internal diameter specification for stormwater culverts for forestry roads or forestry tracks in green, yellow and orange zones with a land slope of less than 25 degrees an appropriate minimum? (Think about the availability of culverts of this size and the products you commonly use or require). Y/N If not, please explain why.

Q D14 **Notice periods (row D7a of Table 6)**: Do you agree that notice periods could be reduced or waived for earthworks, quarrying and harvesting in green and yellow zones? Y/N Please explain your answer with evidence to support your position. If you think notice periods could be reduced what would you suggest is an appropriate notice period?

Q D15 **Notice periods (row D7d of Table 6):** Where you have experience of annual notice periods (either positive or negative) please provide your views on whether annual notifications are working well or whether changes to the regulations are required. If you consider changes are required, please indicate what environmental risks will be better managed through change.

Q D16 **Indigenous vegetation (row D9b of Table 6):** If the definition of indigenous vegetation is changed to that used in the National Policy Statement for Indigenous Vegetation do you foresee any practical or operation issues for plantation forestry and enforcement of the regulations? Y/N Why?

Q D17 **Vegetation clearance (row D9c of Table 6)**: Do you think there will be any negative consequences of amending the definition of vegetation clearance in the NES-PF to clarify that part (b) of the definition does not authorize any vegetation clearance but that a forest crop should generally be harvestable within the constraints of the regulations? Y/N Please provide evidence to support your views.

[83] Where an activity is permitted it must meet specified conditions. Where it cannot meet those conditions, it will require resource consent. That consent status will be determined based on the evidence of potential effects for the particular activity.

Q D18 **Incidental damage (row D9d of Table 6)**: Please provide any evidence you have that the definition of incidental damage is causing issues for users and the nature of those issues. Do you have suggestions for how the definition could be less subjective while still achieving the intent of allowing minor damage to indigenous vegetation under limited circumstances?

Q D19 **Health and safety (row D12a of Table 6)**: What additional information or resources could help foresters and councils make decisions that balance environmental outcomes with worker safety when managing slash?

6.8 Capacity and capability of local authorities to implement the NES-PF

The NES-PF regulations are administered by the Ministry of Primary Industries, but implementation is the responsibility of councils. Councils are also responsible for the compliance, monitoring and enforcement (CME) of the regulations. The extent to which each council can undertake CME is influenced by multiple factors, such as staff availability and capability, the cost of CME, the time to undertake forestry CME, and knowledge of plantation forestry.

One finding of the Year One Review was that some councils lacked capacity and experience in plantation forestry. These skills are not easily gained or available, and many councils experience high turnover rates in CME staff.

Te Uru Rākau - New Zealand Forest Service has sought advice on options to improve this through information and training. The advice was informed by discussions with council and forestry staff. Some councils noted that they were having issues finding suitably qualified staff. Some were also having difficulty keeping qualified staff, given the lower remuneration for council roles compared to other options for staff with forestry CME skills. Some councils said they could only undertake CME as a cost recovery function, so would focus on enforcement, as that was what they could afford. This has led to more comprehensive compliance assessments on forestry by some councils than before the NES-PF came into force, as costs can be recovered under the NES-PF.

Foresters noted that some councils met with them regularly in working groups, aiding understanding of the issues and a greater knowledge base. Some raised concern over compliance being undertaken by staff whose primary background was not forestry, and over different interpretations of the regulations by councils with different skillsets, especially for enforcement or processing consents. Some foresters also noticed a variation in judgement by staff based on skills and experience, and in councils' interpretation of the regulations.

On 1 July 2020, the Ministry for the Environment released the report of the independent Resource Management Review Panel, 'New Directions for Resource Management in New Zealand'. It included a chapter on CME, and made some similar points to those about the NES-PF. It noted that councils' CME effectiveness is limited by: a lack of economy of scale to properly resource CME functions; biases and conflicts of interest (actual and perceived); and competing functions, which means CME has lower priority.[84] The report also stated that a long history of weak oversight and guidance from central government exacerbates the problem. It noted that capability and capacity can be limited, given a slow uptake of CME training, difficulty recruiting and retaining staff, and a lack of qualifications and training.

The Year One review noted that assistance with guidance and implementation for councils could improve the quality and consistency of rules in the long term, including better integration across national direction. The feedback from councils and the forestry sector was that they needed support to ensure the NES-PF is well understood and can be consistently and effectively implemented.

Te Uru Rākau – New Zealand Forest Service would like to improve its information and training to support councils in their role as compliance, monitoring and enforcement bodies.

Questions for councils and foresters

Q D20 What sources of information or training do you currently use to inform your decisions for forestry?

[84] New Directions for Resource Management in New Zealand, June 2020, Chapter 13 Compliance, monitoring and enforcement, paragraph 32, pg 397

PART D: ENABLING FORESTERS AND COUNCILS TO BETTER MANAGE THE ENVIRONMENTAL EFFECTS OF FORESTRY

Q D21 What areas of forestry practice required by the NES-PF do you need more information about or training in?

Q D22 What are the best forms of delivery for that information or training? This may include a range of delivery methods or forums.

NEXT STEPS – HAVE YOUR SAY

The Government welcomes your feedback on this discussion document. To ensure your point of view is clearly understood, you should explain your rationale and provide supporting evidence where appropriate.

Process to develop national direction

The proposals in this discussion document seek to amend the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017. These regulations are national direction under the Resource Management Act 1991.

The Minister for the Environment must undertake several statutory, procedural steps prior to recommending the making or amending of national direction. This includes choosing a public process for developing the instrument,[85] and preparing and publishing an evaluation report that examines the extent to which the objectives of its proposals are the most appropriate way of achieving the purposes of the RMA.[86] The Minister has chosen an officials-led process of public consultation.

Timeframes

We are accepting submissions until **5:00 pm on 18 November 2022**.

After the consultation ends, we will continue to work with iwi/Māori and stakeholders to gather further information if required to refine preferred options. An evaluation report, as required under section 32 of the RMA, will be prepared.

Ministers intend to present finalised proposals to Cabinet in 2023 for a policy decision. Parliamentary Counsel Office would then draft the regulations for final Cabinet consideration and, if approved, gazettal.

How to make a submission

To help you complete your submission, we encourage you to use the editable form available on MPI's website.

Email your submission to mpi.forestry@mpi.govt.nz as a:

- PDF, or
- Microsoft Word document (2003 or later version).

Please include:

- the title of the consultation document – "National direction for plantation and exotic carbon afforestation"
- your name and title
- your organisation's name (if you are submitting on behalf of an organisation, and whether your submission represents the whole organisation or a section of it)
- your contact details (such as phone number, address, and email).

We prefer that you don't post your submission, as it may not reach us in a timely manner. However, if you need to, submissions can also be sent to: Submission – National Direction for Exotic Afforestation, Forestry & Bioeconomy Policy Team, Ministry for Primary Industries, PO Box 2526, Wellington 6140.

[85] Section 46A of the RMA refers.
[86] Section 44(1)(b) of the RMA refers; section 32 sets out the specific requirements and processes for this evaluation.

More information

Please send any queries to mpi.forestry@mpi.govt.nz.

Publishing and releasing submissions

A summary of submissions will be prepared and published on the Ministry for Primary Industries' website, mpi.govt.nz.

All or part of any written comments, including names of submitters, may be published on the Ministry for Primary Industries' website, mpi.govt.nz, including as part of the summary of submissions. Unless you clearly specify otherwise in your submission, the Ministry will consider that you have consented to publication of both your submission and your name.

Contents of submissions may also be released to the public under the Official Information Act 1982 (OIA) if requested. In your submission, please clearly indicate if you wish any part to be withheld from release and the reason(s) for withholding the information. We will consider these factors when responding to OIA requests for copies of, and information on, submissions to this document.

The Privacy Act 2020 applies certain principles regarding the collection, use and disclosure of information about individuals by various agencies, including the Ministry for Primary Industries. It governs access by individuals to information about themselves held by agencies.

Any personal information you supply to the Ministry in the course of making a submission will be used by the Ministry only in relation to the matters covered by this document. Please clearly indicate in your submission if you do not wish your name to be included in the summary of submissions that the Ministry will publish.

You have the right to request access to or to correct any personal information you supply to the Ministry. If you have any questions about the publishing and releasing of submissions, or if you would like to access or correct any personal information you have supplied, please email mpi.forestry@mpi.govt.nz.

QUESTIONS FOR YOUR FEEDBACK

The questions below are a guide for your feedback. Please answer those that are most important to you; there is no need to answer them all.

Part A Managing the environmental (biophysical) effects of exotic carbon forestry

Q A1 Do you agree with the problem statement set out above? Y/N Are there other things we should consider?

Q A2 Have we accurately described the environmental effects of exotic carbon forests (Table 2)? Y/N What other environmental effects (if any) need to be managed that are different to those of plantation forests? Please provide evidence on the impact of these effects.

Q A3 Do you agree that the environmental effects of exotic carbon forests should be managed through the NES-PF? Y/N Why?

Q A4 The right-hand column of Table 2 sets out possible new regulatory controls. Please indicate if you disagree with any of these potential controls or feel we have missed anything, and explain or provide evidence.

Q A5 Do you agree with option 2 for managing the environmental effects of exotic carbon forestry (amend the NES-PF to include exotic carbon forests)? Y/N Why?

Q A6 Do you agree that a National Environmental Standard should manage [choose one]: (a) the environmental effects of exotic carbon forests only? Y/N or (b) environmental effects and forest outcomes, including transitioning from predominantly exotic to predominantly indigenous species? Y/N Why?

Q A7 Do you agree with the proposal in option 2 (amend the NES-PF to include exotic carbon forests) to add wind effects as a matter of discretion to Regulation 17, to manage potential instability as a result of wind for all forests on red zone land? Y/N What benefits or drawbacks would there be from adding wind effects?

Q A8 How effective would option 2 (amend the NES-PF to include exotic carbon forests) be in managing the environmental effects of exotic carbon forestry? [select from a range/scale not effective – highly effective] Why?

Q A9 What implementation support would be needed for option 2 (amend the NES-PF to include exotic carbon forests)?

Q A10 Do you agree with option 3 for managing the environmental effects of exotic carbon forestry (amend the NES-PF to require forest management plans for exotic carbon forests)? Y/N Why?

Q A11 Do you agree that forest management plans should manage [choose one] (a) environmental effects only? Y/N or (b) environmental effects and forest outcomes, including transitioning from predominantly exotic to predominantly indigenous specie(s)? Y/N Why?

Q A12 Based on your answer to the previous question, what content should be required in forest management plans?

Q A13 How effective would option 3 (amend the NES-PF to require forest management plans for exotic carbon forests) be in managing the environmental effects of exotic carbon forestry? [select from a range/scale not effective – highly effective] Why?

Q A14 What implementation support would be needed for option 3 (amend the NES-PF to require forest management plans for exotic carbon forests)?

Part B Controlling the location of plantation and exotic afforestation to manage social, cultural and economic effects

Q B1 Do you agree with the problem statement set out above? Y/N Are there other things we should consider?

Q B2 Have we accurately described the social, cultural, and economic effects of plantation and exotic carbon afforestation at a community level (Appendix D refers)? Y/N What other social, cultural or economic effects should we be aware of? Please provide evidence on the impact of these effects.

Q B3 Do you agree that the social, cultural and economic effects of plantation and exotic carbon forests should be managed through the resource management system? Y/N Why?

Q B4 What is your preferred option for managing the social, cultural and economic effects of plantation and exotic carbon afforestation? Select from list: Option 1 (a local control approach); Option 2 (a consent requirement through national direction); No preference; I do not support either of these options. Why?

Q B5 How effective would option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) be in managing the social, cultural and economic effects of plantation and exotic carbon afforestation? [select from a range/scale not effective – highly effective] Why?

Q B6 What impact would option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) have on the rate and pattern of plantation and exotic carbon afforestation?

Q B7 What are the benefits of option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

Q B8 What are the costs or limitations of option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

Q B9 If option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation) is progressed, would making plan rules to manage the social, cultural and economic effects of plantation and exotic carbon afforestation by controlling its location be a priority for your community or district? Choose from a range Not a priority to high priority Why?

Q B10 What implementation support would be needed for option 1 (a local control approach to managing the location of plantation and exotic carbon afforestation)?

If option 2 (a consent requirement through national direction, to control the location of plantation and exotic carbon afforestation) is further developed:

Q B11 Are the variables outlined above (type of land, scale of afforestation, type of afforestation ie, plantation, exotic carbon, transitional) the most important ones to consider? Y/N What, if any, others should we consider?

Q B12 Which afforestation proposals should require consent? (Please consider factors such as the type of land, the scale of afforestation, the type of afforestation (plantation, exotic carbon, transitional) and other factors you consider important).

Based on your answers above:

Q B13 How effective would option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation) be in managing the social, cultural and economic effects of plantation and exotic carbon afforestation? [select from a range/scale not effective – highly effective] Why?

Q B14 What impact would option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation) have on the rate and pattern of plantation and exotic carbon afforestation? Please explain or provide evidence.

Q B15 What are the benefits of option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

Q B16 What are the costs and limitations of option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

Q B17 What are the most important and urgent social, cultural and economic effects of plantation and exotic carbon afforestation that you would like to see managed under the resource management system? Where and at what scale do these effects need to be managed?

Q B18 Should this be done now under the RMA, or later under the proposed National Planning Framework and NBA plans?

Q B19 Would standards in an amended NES-PF need the support of national policies and objectives? Y/N Why?

Q B20 What implementation support would be needed for option 2 (a consent requirement through national direction to control the location of plantation and exotic carbon afforestation)?

Part C Improving wildfire risk management in all forests

Q C1 Do you agree that wildfire risk management plans (WRMPs) should be included in the NES-PF? Y/N Why?

Q C2 Do you agree that the role of councils in monitoring the WRMP should be limited to ensuring that a plan has been developed? Y/N If not, what should the role of councils be?

Q C3 Do you agree that a five-year review requirement is appropriate for WRMPs? Y/N Why?

Q C4 Do you agree that a module for a WRMP that is consistent with farm plan templates could be used for farmers with forests to plan for managing wildfire risk? Y/N If no, please provide reasons.

Q C5 What implementation support would be needed for this proposal?

Part D Enabling foresters and councils to better manage the environmental effects of forestry

Wilding conifer risk management

Q D1 Do you agree with Proposal 1 for managing wilding risk (update the Wilding Tree Risk Calculator and guidance, and require the submission of a standardised worksheet

assessment to councils at least six months prior to planting)? Y/N If not, please explain why.

Q D2 Do you agree that extending the notification period for wilding conifer scores to no sooner than six months and no later than eight months before afforestation begins is an appropriate length of time? Y/N If not, what timeframe would you suggest and why?

Q D3 Do you agree with Proposal 2 for managing wilding risk (require all forests to assess wilding tree risk at replanting)? Y/N If not, please explain why.

Q D4 Do you agree that changes to regulation 79(6) will clarify the intent and avoid confusion over property access rights? Y/N Why?

Slash management

Q D5 Do you agree with each of the proposed amendments to the NES-PF in relation to slash regulations, set out in Table 4? Y/N If not, please identify any you disagree with by referencing the number in the left-hand column of Table 4 and explain why you disagree.

Q D6 What information about slash risk and slash management do you or your organisation require? What is the best way for you to receive this information?

Q D7 What tools or information do you use to assess operational requirements for the 5 per cent annual exceedance probability (AEP) requirement?

Initial alignment with NES-Freshwater

Q D8 Do you agree with each of the proposed changes to align the NES-PF with the NES-Freshwater, set out in Table 5? Y/N If not, please identify any you disagree with by referencing the number in the left-hand column of Table 5 and explain why you disagree.

Q D9 Do you anticipate any unintended consequences from this proposal to align parts of the NES-PF with the NES-Freshwater?

Operational and technical issues

Q D10 Do you agree with each of the proposed changes to the NES-PF to address operational and technical issues, set out in Table 6? Y/N If not, please identify any you disagree with by the number in the left-hand column of Table 6 and explain why you disagree.

In some cases we have not proposed an amendment but are seeking further information, as follows:

Q D11 **Temporary structures for river crossings (row D5d of Table 6)**: Do you agree that this type of river crossing could be permitted under certain conditions? Y/N What conditions should be applied to the crossing as a permitted activity?[87]

Q D12 **Dual culverts (row D5e of Table 6)**: Is there a need to include double culverts in the regulations? Y/N If so, what permitted activity conditions should apply to these river crossings?

Q D13 **Culvert diameters (row D5g of Table 6)**: Is a 325mm minimum internal diameter specification for stormwater culverts for forestry roads or forestry tracks in green, yellow and orange zones with a land slope of less than 25 degrees an appropriate minimum?

[87] Where an activity is permitted it must meet specified conditions. Where it cannot meet those conditions, it will require resource consent. That consent status will be determined based on the evidence of potential effects for the particular activity.

(Think about the availability of culverts of this size and the products you commonly use or require). Y/N If not, please explain why.

Q D14 **Notice periods (row D7a of Table 6)**: Do you agree that notice periods could be reduced or waived for earthworks, quarrying and harvesting in green and yellow zones? Y/N Please explain your answer with evidence to support your position. If you think notice periods could be reduced what would you suggest is an appropriate notice period?

Q D15 **Notice periods (row D7d of Table 6):** Where you have experience of annual notice periods (either positive or negative) please provide your views on whether annual notifications are working well or whether changes to the regulations are required. If you consider changes are required, please indicate what environmental risks will be better managed through change.

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Q D18 **Incidental damage (row D9d of Table 6)**: Please provide any evidence you have that the definition of incidental damage is causing issues for users and the nature of those issues. Do you have suggestions for how the definition could be less subjective while still achieving the intent of allowing minor damage to indigenous vegetation under limited circumstances?

Q D19 **Health and safety (row D12a of Table 6)**: What additional information or resources could help foresters and councils make decisions that balance environmental outcomes with worker safety when managing slash?

Capacity and capability of local authorities to implement the NES-PF

Questions for councils and foresters

Q D20 What sources of information or training do you currently use to inform your decisions for forestry?

Q D21 What areas of forestry practice required by the NES-PF do you need more information about or training in?

Q D22 What are the best forms of delivery for that information or training? This may include a range of delivery methods or forums.

APPENDIX A: SUMMARY OF CURRENT AND PROPOSED CHANGES TO THE REGULATORY FRAMEWORK

Title Short description	Relevance for forestry
Current regulation	
Fire and Emergency New Zealand Act 2017 provides the framework for fire risk and response	• FENZ has Operational Service Agreements with most of the larger forestry enterprises. • FENZ is a party to the Plantation Forestry Rural Fire Control Charter.
Biosecurity Act 1993 enables pest management, largely through regional council pest management plans; through surveillance plans, manages the risk of pests and novel diseases establishing.	• Regional councils to develop and take action on regional pest management plans for their area,[88] including the risk of wilding tree spread. Enables partial management of wildings, pests and disease originating from planted forests. • Under a Government Industry Agreement, the Government and the forestry sector share the costs of surveillance, readiness, and managing future biosecurity threats that affect forestry.
Wild Animal Control Act 1978 is the primary framework for regulation of ungulate and some other species, including farming and hunting; operates in tandem with the Biosecurity Act	• Enables management or control of deer, chamois & tahr, and feral goats and pigs
Forests Act 1949 sets the requirements for any harvest, milling or export of existing or regenerating indigenous forests on private land.	• Regulates the harvesting, milling and exporting of indigenous timber and gives landowners limited options for timber

[88] S12b-14 of the Biosecurity Act 1993.

	income from indigenous forests. • Outlines provisions and procedures for the sustainable management of indigenous forests under approved Sustainable Forest Management Plans and Permits.[89]
The Climate Change Response Act puts in place a legal framework to enable New Zealand to meet its international climate change obligations. It sets up the New Zealand Emissions Trading Scheme (NZ ETS) and regulations are made under the Act to manage different sectors.	• The Climate Change (Forestry Sector) Regulations 2008 set out rules to manage requirements for forest land under the NZ ETS.[90] • The NZ ETS requires the forestry sector to report their annual greenhouse gas emissions to the Government. • Forests sequestering carbon can earn NZ Units if eligible for the NZ ETS.
The Local Government Act 2002 enables (only) regional councils to make bylaws for forestry[91]. Regional, district and unitary responsibilities will likely be altered through the Government's review of local government.[92]	• Bylaw-making powers are limited to the forests that the regional council owns or controls.
Freshwater Fisheries Regulations 1983 provide the general framework for freshwater fisheries management	• Includes requirements for fish passage and a process for granting exemptions. NES-F standards are consistent with the FWFRs
The national policy statement for freshwater management (NPS-FM) directs regional councils on managing freshwater under the RMA. More information:	• The NES-PF sets controls for managing the effects of forestry on freshwater, but regional councils may make more stringent rules.

[89] Part IIIA of the Forests Act 1949 (as amended).
[90] https://www.legislation.govt.nz/regulation/public/2008/0355/latest/DLM1633759.html?search=ts_regulation%40deemedreg_climate+change_resel_25_a&p=1
[91] S.149(1)a of the Local Government Act 2002.
[92] https://www.dia.govt.nz/Future-for-Local-Government-Review

https://environment.govt.nz/acts-and-regulations/national-policy-statements/national-policy-statement-freshwater-management/ https://environment.govt.nz/acts-and-regulations/national-policy-statements/national-policy-statement-freshwater-management/	• Improve degraded water bodies and maintain or improve all others, using bottom lines defined in the NPS-FM. • Avoid any further loss or degradation of wetlands and streams, map existing wetlands and encourage restoration. • Identify and work towards target outcomes for fish abundance, diversity and passage, and address in-stream barriers to fish passage over time.
The National environmental standards for freshwater (NES-F) regulates activities that pose risks to the health of freshwater and freshwater ecosystems. More information: https://environment.govt.nz/acts-and-regulations/regulations/national-environmental-standards-for-freshwater/ https://environment.govt.nz/acts-and-regulations/regulations/national-environmental-standards-for-freshwater/	• The NES-PF sets controls for managing the effects of forestry on freshwater, and prevails over the NES-Freshwater.[93] The NES-Freshwater standards are designed to: • protect inland and coastal wetlands • protect urban and rural streams from in-filling, and • ensure connectivity of fish habitat (fish passage).
The New Zealand Coastal Policy Statement provides direction for resource management policy and planning in the coastal environment. More information: https://environment.govt.nz/acts-and-regulations/national-policy-statements/new-zealand-coastal-policy-statement/https://environment.govt.nz/acts-and-regulations/national-policy-statements/new-zealand-coastal-policy-statement/	• Provides direction for afforestation and forestry-related activities in the coastal environment, including coastal waterways and wetlands. The coastal environment is defined in regional coastal plans and is generally the land between the coastal marine area and the dominant ridgeline to landward

[93] Regulation 7 https://www.legislation.govt.nz/regulation/public/2020/0174/latest/LMS364212.html

<table>
<tr><td colspan="4"></td><td>• The NES-PF sets controls for managing the effects of forestry on coastal marine areas. Regional councils may make more stringent rules to give effect to policies/objectives relating to: indigenous biological diversity; preserving natural character, natural features and natural landscapes; and sediment in the NZ-CPS.
• The NZ-CPS directs councils in their day-to-day management of the coastal environment.</td></tr>
<tr><td colspan="5">Proposed regulation</td></tr>
<tr><td>New Zealand Emissions Trading Scheme (NZ ETS)

In March and April 2022, the Government consulted on: Managing exotic afforestation incentives by changing the forestry settings in the NZ ETS. The key proposals included:
- excluding exotic forests from the permanent post-1989 category in the NZ ETS
- whether to adjust how carbon accounting applies to forests on remote and marginal land
- opportunities to improve incentives for indigenous afforestation.

For more information on the NZ ETS proposals and consultation, see the full discussion document: www.mpi.govt.nz/consultations/managing-exotic-afforestation-incentives/</td><td>Incentives for afforestation are a key driver for the rate and type of afforestation.

Feedback received during that consultation has also informed our analysis for this discussion document.</td><td>Incentives for afforestation are a key driver for the rate and type of afforestation.

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<tr><td colspan="4">Overseas Investment Act Forestry Review: Removing Forestry Conversions from the Special Forestry Test

In May 2022 the Government tabled legislation to remove farm to forestry conversions from the Overseas Investment Act special forestry test; this specifies that forestry conversions instead go through the Benefit to New Zealand Test.</td><td>This change will ensure that, through the overseas investment screening regime, forestry conversions demonstrate benefits to New Zealand by aligning the assessment of forestry conversions with the approach taken under the Act for most other land-based investments.</td></tr>
</table>

	The Benefit to New Zealand test is more complex than the special forestry test. It requires in-depth consideration of the additional benefits of the investment across seven factors[94]. It involves greater discretion for decision-makers and would apply only to investments that are conversions from another land use (eg, farming) into forestry.
The proposed National Policy Statement for Highly Productive Land (NPS-HPL) will seek to maintain the availability of highly productive land for future primary production. More information: https://environment.govt.nz/acts-and-regulations/national-policy-statements/proposed-nps-highly-productive-land/https://environment.govt.nz/acts-and-regulations/national-policy-statements/proposed-nps-highly-productive-land/	The objective of this NPS is to protect highly productive land for agriculture, pastoral, horticultural, or forestry activities that rely on the soil resource, both for now and for future generations.
The National Policy Statement for Indigenous Biodiversity (NPS-IB) will seek to clarify minimum standards to maintain biodiversity and raise the value and profile of indigenous biodiversity in decision- making. More information: https://environment.govt.nz/acts-and-regulations/national-policy-statements/proposed-nps-indigenous-biodiversity/https://environment.govt.nz/acts-and-regulations/national-policy-statements/proposed-nps-indigenous-biodiversity/	• Includes a definition for SNAs and a timeframe for councils to locate, describe and map SNAs • Makes special provision for management of areas within plantation forest that meet SNA criteria

[94] https://www.linz.govt.nz/overseas-investment/discover/overseas-investment-tests/benefit-new-zealand-test#:~:text=The%20benefit%20to%20New%20Zealand%20test%20is%20applied%20to%20transactions,assessing%20applications%20against%207%20factors.

APPENDIX B: EXISTING REQUIREMENTS FOR FOREST MANAGEMENT PLANS

Climate Change Response Act 2002	Applicants to the ETS need to comply with the requirements of the RMA but this but this does not encompass ongoing management of the forest. A decision over any further links between the CCRA and the RMA would be required if forest management plans under the RMA were to provide a regulatory function under the CCRA.
Forests Act 1949	Applications for a sustainable management permit under this Act are commented on by the Director-General of Conservation and, in the case of Māori land, the Chief Executive of the Ministry of Māori Development (Te Puni Kōkiri) prior to their approval. Clarity is required over any overlap where forests are transitioning to predominantly indigenous species and limited harvest is envisaged.
Biosecurity Act 1993	Controls pests and diseases for forest, pests from forests (including wilding tree spread to neighbouring properties), and wider ecosystem health (as distinct from the weeds and pests controlled for biodiversity purposes under the RMA).
Fire and Emergency New Zealand Act 2017	Controls fire preparedness and response (as distinct from the control of wildfire for RMA purposes as set out in Part C of this discussion document).
Industry standards, eg, Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC)	Already require management plans.

APPENDIX C: ENVIRONMENTAL EFFECTS OF EXOTIC FORESTRY AND AFFORESTATION

Category of effect	Type of effect from plantation and exotic carbon forestry	Difference between plantation and exotic carbon forestry
Biodiversity/ ecological	**Adverse:** • Wilding tree spread risk • Habitat for mammalian pests and weeds • Potential for tree diseases, which can spread into surrounding forests **Positive:** • Regulates water supply and quality • Supports restoration/regeneration, especially by including indigenous planting (eg, mixed forests) • Both plantation and exotic carbon forests can provide good habitat for some indigenous species, particularly as part of a corridor effect • Shade for aquatic biodiversity • Improving air quality	Positive and adverse effects can arise from both practices. The nature and extent of outcomes often depends on forestry management.
Natural hazards	**Adverse:** • Higher risk of hazards during harvest and in the post-harvest window, particularly under intense rainfall (accelerated erosion, mid-slope failure, mobilisation of forestry slash) • Increased impact of wildfires **Positive:** • Reduced risk of erosion and landslip, particularly on erosion-prone land • Management of flood flows	Risk of wildfire depends on management regime and fire surveillance. The risk is often less for plantation forests, where pruning reduces fuel load, surveillance is regular and fire plans exist. Adverse effects of forest harvest on erosion, flood risk, mobilisation of forest slash. Carbon forestry has greater positive effects on erosion-prone land, as long as species and density promote stability.
Landscape	**Adverse:** • Landscape effects of exotic carbon afforestation on open rural landscapes (including significant, rural scenic, outstanding natural landscapes, outstanding natural character in the coastal environment).	Permanence of the land use can increase the extent of the landscape effect, both positive and negative. Harvesting/clearfells of plantation forestry increase adverse landscape effects.

Category of effect	Type of effect from plantation and exotic carbon forestry	Difference between plantation and exotic carbon forestry
	• Reverse sensitivity **Positive:** • Low landscape impact within gullies and on erosion-prone hill slopes • Mixed forests can support indigenous forest restoration • Enhances the appearance of the landscape	

APPENDIX D: SOCAL, CULTURAL AND ECONOMIC EFFECTS OF PLANTATION AND EXOTIC AFFORESTATION

This summary considers three broad types of forestry: plantation forestry intended for harvest; exotic carbon forestry not intended for harvest; and a transitional model under which exotic species are replaced by indigenous species over time. Within each category, forest management regimes and practices will influence social, economic and cultural effects on local communities. Plantation forestry may also benefit communities through post-harvest activity if this is done locally. Other factors include the social and economic profile of the community, and how the afforestation would contribute to the community, by comparison with the status quo.

	Social and cultural effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
Rural population	Strongly linked to effects on local employment opportunities (below) ie, whether an increase in forestry jobs outweighs any job losses from a reduction in other activities. Population gain or loss may have indirect effects on social infrastructure and facilities (eg, support networks, schools, healthcare, sports).	Strongly linked to effects on local employment opportunities (below). Likely overall loss of jobs, flowing through to population loss. Population loss may have adverse indirect effects on social infrastructure and facilities (eg, support networks, schools, healthcare, sports).	Strongly linked to effects on local employment opportunities (below) and hence dependent on management regime and age of forest. Population gain or loss may have indirect effects on social infrastructure and facilities (eg, support networks, schools, healthcare, sports).
Rural infrastructure	Positive or negative effect on rating base if population and businesses are gained or lost. In some areas, road damage and increased safety risk from logging trucks at harvest time.	Adverse effect of depopulation on rating base if people move outside the district.	Positive or negative effect on rating base if population and businesses are gained or lost.
Cultural wellbeing	Afforestation may be a threat to the wellbeing of wāhi tapu sites. Cultural values such as spirituality and kaitiakitanga can be regionally specific, and similar activities may affect groups differently. Increased afforestation: • provides greater access to these areas for collecting traditional materials	As for plantation forestry re effects on wāhi tapu sites. Cultural values such as spirituality and kaitiakitanga can be regionally specific, and similar activities may affect groups differently. May strengthen iwi and hapū connections to their land. Without financial resources being established through employment or incentives, any cultural wellbeing could be oppressed or lost as	Cultural values such as spirituality and kaitiakitanga can be regionally specific, and similar activities may affect groups differently. Positive effect on Māori forest owners given the extensive mātauranga about indigenous forests. Opportunity to exercise kaitiakitanga relationships with taonga species. Increased afforestation:

	Social and cultural effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
	• multiple avenues for traditional cultural activities. • can provide greater access for recreation. • may strengthen iwi and hapū connections to their land.	people are needed to keep cultures vibrant and developing, and to protect sites of significance.	• provides greater access to these areas for collection of traditional materials • provides multiple avenues for traditional cultural activities • can provide greater access for recreation • may strengthen iwi and hapū connections to their land.
Health and wellbeing	Mental health and wellbeing impacts if afforestation is experienced as rapid change beyond individuals' control.[95] Effects on community sense of identity if tied to a pattern of land use or activities. Rapid or widespread change may be challenging for individuals and communities. Māori communities may suffer more negative impacts on health and economic wellbeing where there are inequities.		

[95] The Impacts of Afforestation on Rural Communities: A case study in the Tararua District of New Zealand (Heather Collins and Angela McFetridge, prepared for Tararua District Council, 2021) recognised positive and negative impacts of afforestation. It reported that some participants considered change was happening *to* them rather than *with* them, and described a loss of community and connection with place and people, among other impacts.

	Economic effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
Contribution to local and regional economies	Income per hectare may be higher than from farming over the productive life of the forest.[96] [97] At community level, income and expenditure may be variable and irregular, depending on the mix of ages, silvicultural regime and rotation length of local forests.[98] Continuous cover forestry models may provide more stable employment once harvest starts. Income and expenditure likely to be more regular if post-harvest processing plants or support services are established or expanded locally. Multiple rotations enable perpetual (albeit intermittent) income stream. May provide wider opportunities to diversify the local economy, for example tourism and recreational (eg, hunting, mountain biking).	Higher returns from carbon than from farming, for the period of eligibility for carbon credits, currently 50 years. Nil income beyond that unless felled. Little expenditure within the local community – eg, planting, pest control. Opportunities for economic investment by Māori as Whenua Māori (Māori land including freehold and customary land)is disproportionately on land considered marginal, steep or erosion prone. Different corporate structures and ownership models where afforestation involves the sale of former farmland.	Dependent on management regime and age of forest. Carbon income for the period of eligibility for carbon credits, currently 50 years. Nil carbon income beyond that; potential for other income streams depending on management regime, owners' objectives and other factors. Opportunities to diversify the local economy eg, supply of seedlings. In some cases, potential for selected harvesting of indigenous species (50-60 year minimum rotation), wood processing or tourism/recreation. Different corporate structures and ownership models where afforestation involves the sale of former farmland.

[96] Economic Impact of Forestry in New Zealand (PwC for Te Uru Rākau – New Zealand Forest Service, May 2020) concluded that across the value chain production forestry generates significantly more value-add per hectare than sheep and beef farming ($4.6m per 1000 hectares compared with $1.7m). The report comments that its figures are national averages for the whole supply chain, and do not reflect the impacts from any particular 1000 hectares.

[97] Social and economic impacts of large-scale afforestation on rural communities in the Wairoa District (BakerAg, 2019, prepared for Beef + Lamb New Zealand) estimates Net Present Value (NPV) over 60 years as $4225 for sheep and beef farming, $659 for a plantation forest not receiving carbon income, $8410 for a plantation forest receiving carbon credits under the ETS, and $9386 for carbon farming with no harvesting. The analysis assumed a carbon price of $25/t.

[98] For example, economic, social and cultural impacts of large-scale afforestation on rural communities in the Wairoa District (BakerAg, 2019, prepared for Beef + Lamb New Zealand) estimated direct local expenditure from harvest (plantation) forestry at $107,283 per 1000 hectares per year for the first 29 years, increasing exponentially to $4,290,482 per 1000 hectares in year 30 (harvest).

	Economic effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
	Different corporate structures and ownership models where afforestation involves the sale of former farmland.[99] [100] May provide more opportunities for Māori who have significant economic investment in the broader primary industries and large amounts of land that is likely suitable for some form of forestry.		
Employment opportunities[101] [102]and local services	Depending on scale of land use change and local economic activity prior to afforestation, a reduction in: • stable on-farm employment • contract work (e.g. shearing, fencing); or - farm support services (eg, vets, farm consultants, agricultural contractors), or	As for plantation forestry re impact on farming-related jobs and services. Very few forestry employment opportunities beyond planting.[104]	As for plantation forestry re impact on farming-related jobs and services. Forestry employment opportunities dependent on management regime and age of forest. Actively managed forests may offer more employment than some pastoral uses on low versatility land. New employment opportunities may be irregular or seasonal.

[99] Compendium of New Zealand Farm Facts 2021 45th edition (Beef + Lamb New Zealand) reports that approximately 92% of sheep and beef farms are owner-operated.
[100] At 1 April 2021 most of New Zealand's forests are relatively small. Te Uru Rākau – New Zealand Forest Service estimates there are more than 10,000 owners with forests smaller than 40 hectares, most of them farm foresters. Between 40 hectares and 9,999 hectares there is a mix of ownership structures, and of foresters and farm foresters. New Zealand's largest forests are owned by 29 entities comprising large corporate foresters, iwi, and some family ownership structures. Collectively this group owns 1,027,787 hectares of forests above 10,000 hectares. Source: https://www.mpi.govt.nz/dmsdocument/49111-2021-NEFD-tables
[101] Economic, and social and cultural impacts of large-scale afforestation on rural communities in the Wairoa District (BakerAg, 2019) estimates of local jobs per annum per 1000 hectares were: 7.4 for sheep and beef farming, 5.1 for plantation forestry averaged across an assumed 30 year rotation, but unevenly distributed with an average of 2.2 jobs per annum for the first 29 years and up to 89 jobs in the harvest year. The report estimates 0.6 local jobs per annum per 1000 hectares for carbon farming with no harvesting.
[102] Economic Impact of Forestry in New Zealand (PwC for Te Uru Rākau – New Zealand Forest Service, May 2020) modelled employment impacts at a national level and concluded 7 FTE jobs are generated directly by the sheep and beef value chain, per 1,000 hectares, and 11 by the forestry value chain.
[104] Economic Impact of Forestry in New Zealand (PwC for Te Uru Rākau – New Zealand Forest Service, May 2020) modelled employment impacts at a national level and concluded almost no employment impacts are generated from permanent carbon forestry, by comparison to sheep and beef and plantation forestry.

	Economic effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
	increased distance and cost to access these services • processing (meat, wool, co-products). Over time, growth in: • forestry work (e.g. planting, pruning, harvesting), including for Māori who make up about 40% of the sector workforce[103] • support services (e.g. seedling supply, trucking) • timber and biofuel processing • forest and operations management (managerial, specialist and technical roles). Dependent on: • location of management and processing functions, and whether forestry workers live locally • access to training and education • the end product (e.g. logs for export vs finished timber and other products) • time lag between reduction in farming activity and growth in forestry opportunities – greatest demand for		Existing skillsets and work preferences may not translate easily to new opportunities.

[103] Te Ōhanga Māori 2018: The Māori Economy 2018 (Reserve Bank, BERL, 2018: Te Ōhanga Māori 2018.pdf (berl.co.nz)

	Economic effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
	forest-related labour is at (or after) harvesting. New employment opportunities may be irregular or seasonal. Existing skill sets and work preferences may not translate easily to new opportunities.		
Forestry production	Increase in wood products, biofuels and carbon sequestration, in perpetuity if each harvest is followed by replanting.	Increase in carbon sequestration, dependent on the life of the forest.	Increase in carbon sequestration, in perpetuity assuming a carbon (naturally regenerating) indigenous forest is established. Potential increase in wood products over the long term, depending on management regime, for example selective harvesting of indigenous trees.
Farm production	Reduction in farmland.[105] Depending on the quality of the land and its previous productivity, potential for a reduction in meat, wool and co-products with flow-on effects across the value chain.[106] The impact may extend beyond the local area due to the movement of livestock within the wider food production system (eg, lambs bred on hard hill and high country sent off for finishing on easier land). Potential for a disproportionate effect on products best suited to hill and high country, for example fine wool.		

[105] Analysis commissioned by Beef + Lamb New Zealand of rural property sales between 1 January 2021 and 30 June 2021 estimated whole farm sales purchased for exotic forestry totalled an estimated 11,585 hectares. 80.7% of the whole farms sold into forestry were in clear pasture; 72.6% was in LUC 6, 18.1% in LUC 7 and 0.2% in LUC 8. (Independent validation of land-use change from pastoral farming to large-scale forestry, Orme & Associates, November 2021).

[106] "B + LNZ estimate that transitioning productive land to exotic forestry over the last three years has resulted in a reduction of up to 700,000 stock units (or 700,000 sheep), with downstream implications for processing companies and supplying services." (Independent research highlights need for limits on forestry offsetting for fossil fuel emitters, Beef + Lamb New Zealand, 4 August 2021.)

	Economic effects		
	Plantation	**Exotic carbon forestry**	**Transitional exotic to indigenous**
	An exception is the integration of forestry within a farm, particularly on the less versatile land. This may bring an increase in farm production on the more versatile land. This would be consistent with the Climate Change Commission's demonstration path for its recommended emissions budgets, under which sheep and beef stock units would reduce while production per animal increases.[107] Diversification through the continued integration of forestry on farms may spread risk and provide environmental benefits such as erosion control, better management of water flows, and the ability to offset the farm's greenhouse gas emissions.		
Opportunity for future land use change	Afforestation is a long-term change in land use, with periodic (but infrequent) opportunities for future changes, after each harvest. For plantation forests registered under the NZ ETS there is a strong incentive to replant. Future conversion to pastoral or other uses remains an option but may be difficult or costly – eg, due to acidification, residual stumps and slash. If afforestation has resulted in loss of farm support services over time, conversion back to farming may be difficult or costly.	Very long-term change in land use. Future land use beyond the natural life of the trees uncertain. Risk of abandonment once carbon revenue is exhausted.	Permanent change in land use. This is important for Māori who require significant financial resourcing to achieve aspirations of native afforestation, clean waterways etc.

[107] Nationally, sheep and beef animal numbers are projected to fall by around 8% from 2019 levels by 2030, under the Current Policy Reference case in the Climate Change Commission's advice to the Government. The projected increase is due to continued retirement of farmland and land-use change to forestry. The Commission's demonstration path sees deeper reductions in sheep and beef animal numbers of an additional 5 percentage points below 2019 by 2030, with only a small additional drop in meat production of around 1 percentage point, on the assumption that farmers will make significant productivity gains at the same time as reducing livestock numbers. This includes the impact of new native forests established on sheep and beef farms, which is assumed to have a small effect on production. 'Ināia tonu nei: a low emissions future for Aotearoa' (He Pou a Rangi Climate Change Commission, 2021).

There is also some evidence that the increasing demand for forestry land is placing upwards pressure on rural land prices.[108] [109] This is not an effect of afforestation itself but rather of the changing economics of different land uses. We consider that, over time, different types of forestry are likely to have different impacts on the value of rural land, as follows:

- Land used for plantation forestry is expected to maintain its value through multiple rotations.
- Land used for exotic carbon forestry is likely to reduce in value over time. The value may become very low as the forest approaches the end of its eligibility for carbon income and beyond.
- The long-term impact on land prices of a transition from exotic to permanent indigenous forest is uncertain.

[108] For example, a green paper prepared by Yule Alexander comments that a significant percentage of sheep and beef farm sales in 2021 on the East Coast of the North Island have gone to forestry use, significantly lifting prices and farm equity. The report comments that there are both benefits and downsides to the higher land value. 'Managing Forestry Land-Use under the influence of Carbon – The Issues and Options – A Green Paper' (Yule Alexander, February 2022).

[109] Analysis commissioned by Beef + Lamb New Zealand of rural property sales between 1 January 2021 and 30 June 2021 comments: "With projected returns on forestry investments increasing due to the addition of carbon revenues, 'forestry' is now able and prepared to pay more for the land than 'traditional farming', and as forestry buyers have arrived on the scene, some landowners have chosen to take the opportunity to benefit, with the time being right to move on to the next farm or next stage in life ... The evidence would, on the surface, suggest that the price of carbon has certainly had an increased effect on not only the land values, but also the type of land that is able to be traded…" ('Independent validation of land-use change from pastoral farming to large-scale forestry', Orme & Associates, November 2021).

APPENDIX E: WILDING CONIFER TECHNICAL ADVISORY GROUP RECOMMENDATIONS FOR THE WILDING TREE RISK CALCULATOR

In summary the TAG recommends the following changes to the calculator and its use:

- To improve accuracy, and therefore certainty, in the calculator's scoring, update the assessment structure and the criteria to establish a risk score by:
  - removing existing criteria that are inherently unreliable or are correlated with other existing criteria
  - assessing and recording the level of uncertainty about each criterion, to give a level of confidence
  - aligning the consent threshold with the new scoring, to maintain the same regulatory requirement levels.
- Attune the calculator to *Pinus radiata* and Douglas fir, the predominant plantation species, as these put the greatest proportional pressure on potential wilding spread. Other commercial species will remain in the calculator.
- Calculator score sheets should follow a worksheet template that requires the assessment workings to be submitted to councils alongside the scores. This will increase consistency in assessment quality and transparency for councils.
- Further work is required on novel, potential and existing commercial species to incorporate into the calculator.
- Changes to the calculator and its guidance should be reviewed in five years to assess how they are being applied.
- To ensure the science underpinning the calculator is up to date, the calculator should be reviewed at least every five years.

Expert advice

The report on the Year One Review of the NES-PF revealed some issues with the calculator. In response, Te Uru Rākau – New Zealand Forest Service has sought expert advice on potential improvements, based on scientific evidence, to help with the review consultation process.

The advice below was compiled through online workshops and is endorsed by TAG experts, and the Winning Against Wildings and Viva La Resistance research programmes. This group are not experts in policy, and have been engaged to provide technical advice on improving the calculator.

Recommended improvements to calculating wilding tree risk

1. Rebuild the calculator's criteria to target the three factors that are most important for spread risk: propagule pressure, dispersal potential, and likelihood of establishment. Each is composed of a number of criteria, and each criterion will be given a risk score based on available scientific evidence.

    a. **Propagule pressure** – the predicted number of seeds produced and released from the mature plantation over its productive lifetime. Proposed criteria may include:

        i. Species seed production volume – species vary widely in their time to maturity and seed production.

        ii. Species seed release potential – some species are more or less likely to release seeds in specific environmental conditions.

iii. Climate at the site (eg, high country/lowland) – seed production changes predictably with climate and site productivity.

iv. Spatial configuration of plantation (eg, edge to centre ratio of area) – the greater the exposed edge compared to centre, the more cones are exposed and released into the environment unhindered.

b. **Dispersal potential** – how far the seeds travel into the surrounding environment under average wind conditions during the seed release period. Proposed criteria may include:

i. Seed terminal velocity (ie, how quickly seeds fall in still air) – seeds from different species travel different distances.

ii. Site exposure to winds – plantations on steeper slopes/ridge tops are more exposed to strong winds or turbulence, which will disperse seeds further.

iii. Predicted dispersal kernel (ie, distances over which seeds fall from a source) around the proposed plantation under normal climatic conditions, where up to 95 per cent of seeds are likely to fall.

c. **Likelihood of establishment** – what proportion of the dispersed seeds go on to germinate and grow into wilding populations. Proposed criteria may include:

i. The species involved – different species have different survival rates, and larger seeds have higher survival rates.

ii. Shade tolerance – some species can establish in shady conditions, while others need to be exposed to sunlight.

iii. Frost tolerance – some species are more prone to frost fatality than other species.

iv. Land cover class of surrounding land (land cover database) – different types of vegetative cover can either support or suppress seedling germination. Data is available for *P. radiata* establishment associated with these classes.

2. Assign each criteria score an associated uncertainty score. This will reflect the confidence in the accuracy of the criteria score. It will allow the calculator to be more refined in its assessment than the current system, which deals only in absolute scores.

3. Remove the palatability criteria – current data shows that browsing has little impact on species establishment, and that there is high uncertainty about this variable over the lifetime of a plantation. Current scores centre on browsing by sheep, but over the lifetime of the forest the rates of surrounding browsing can change. If surrounding stocking rates are reduced or removed, even for a short period, seedlings can quickly establish.

4. Remove the land use criteria. This is because there is too much uncertainty inherent in assessing this criterion, since land use can change significantly over the lifetime of a plantation. This aspect of risk assessment is also linked to species' palatability and vegetative cover – both are more effectively measured by land cover class of the surrounding land.

5. Given that *P. radiata* and Douglas fir make up 96% by area of the current plantation estate, attune the calculator to these two conifer species based on evidence, and assess and reflect the spread risk of new species in the calculator as required.

6. Collect further data to underpin criteria scores for the *Pinus radiata* x *attenuata* hybrid. Although *P. radiata* and Douglas fir make up 96 per cent of current plantations, further work is needed to address new commercial species, such as the *P. radiata* x *attenuata* hybrid, to include them in the calculator. It is currently assumed that this hybrid shares similar spread risk scores to *P. radiata*, but this has not been confirmed. This is important for ensuring suitable species are being planted in suitable places.

7. Remove *Pinus contorta*, which has been designated an unwanted organism under the Biosecurity Act. This species is no longer allowed to be planted.

Recommended improvements to applying the wilding tree risk

8. Regularly view any improvements to the calculator. We suggest every five years. The calculator and the accompanying guidance should be regularly maintained and updated to ensure the most current knowledge of wilding tree risk is being used.

9. To ensure calculator improvements are easily measurable within the five-year period, we recommend that Te Uru Rākau – New Zealand Forest Service set up a formal review process that collects and reviews wilding tree risk assessments submitted to councils.

10. Design an electronic worksheet template for submitting wilding tree risk assessments. This will help with consistency in applications and approach, and will also be helpful for training and auditing purposes.

11. Revisit the threshold score to reflect any changes in the calculator's criteria. Further development of the criteria, and alignment with policy decisions, will be necessary to settle on the appropriate risk threshold.

12. Change the name of the calculator to the Wilding Tree Risk Assessment Tool. Using 'calculator' indicates precision, whereas there will always be some uncertainty in this type of assessment.

13. We recommend that a borderline score close to the threshold limit in the calculator triggers the applicant to undergo a peer review (by a suitably qualified person registered with an institution or professional association, with a code of ethics and discipline committee). For example, with the current calculator 12 is the trigger for consenting under NES-PF regulation 11(3), so a score of 11/20 will be peer-reviewed.

Recommended improvements outside the calculator's scope

14. The surest way to stop wilding tree risk is to remove seeds from the equation. This can be achieved by planting sterile trees. Gene editing has already produced sterile Douglas fir trees in a controlled trial. This type of development presents an opportunity to significantly reduce the risk of wilding trees spreading from plantations. However, legislative and societal barriers exist to planting them in New Zealand. It is recommended that the Government investigate how to remove these barriers.

15. 'Ground truth' the improved calculator or risk assessment tool, to provide the evidence to understand how changes to the calculator affect wilding spread. This may require a large study but is important to understand the effectiveness of the criteria, and the overall score in managing risk. This study could be done using existing planted forests that are of coning age, and retrospectively applying a new risk assessment. This would be correlated with the seen wilding spread and the forest owner's control of spread.

APPENDIX F: ADDITIONAL INFORMATION ON THE EROSION SUSCEPTABILITY CLASSIFICATION

The Erosion Susceptibility Classification (ESC) is a spatial tool that provides a meta-layer derived from the NZ Land Resource Inventory (NZLRI),[110] developed in the 1970-80s. It groups the NZLRI's Land Use Capability (LUC) units according to their erosion risk under a short rotation plantation forestry regime. It maps land at a 1:50,000 scale, because underlying NZLRI data is not more specific than this at a national scale.

About three-quarters of any off-site sediment risk from forest operations is due to mass movement issues (depending on site characteristics, particularly rock type).[111] Measures that avoid exacerbating these risks are important to build into forest operations.

The ESC was developed as a drafting gate for resource consent. Land with very high risk of mass movement erosion (red zone) requires resource consent for most forestry activities, including afforestation. The intent of the NES-PF is that on highly erosion-prone land, new forests should not be planted if harvest will create a legacy issue for the land and downstream communities. The local council should assess the appropriateness of afforestation, with wide matters of discretion and the ability to refuse consent.

Scale

When the ESC was developed it was understood that a tool that maps land at a 1:50,000 scale would not provide enough erosion risk information at a forestry planning level. To address this, the NES-PF requires that forestry earthworks and harvest plans include mapping at a 1:10,000 scale, so that on-site planning reflects the site-specific erosion risk (see Schedule 3(2)(a)).

Forestry quarrying requires mapping to 1:1,000 – 1:5,000 for planning (see Schedule 4(2)(a). Feedback since the NES-PF came into force indicates that this requirement is not understood by all users of the NES-PF. Te Uru Rākau – New Zealand Forest Service has issued guidance on this[112] but we are also proposing minor changes to clarify the requirement (see proposal D10a in Part D).

Accuracy of a national tool

The review noted that some regions have questioned the accuracy of the ESC at a finer scale. Since the ESC was conceived of and developed, we have seen advances in the tools and the science that can be applied on a site specific, and sometimes a catchment basis. Efforts to understand erosion susceptibility and predict sediment pathways have increased since sediment attributes were developed in the NPS-FM. Regional councils are working through how they will meet these targets.

For example, coupling the LUC information that underpins the ESC with LiDAR[113] imagery gives a harvest planner a very good idea of where the site risks are and how the site will behave, once any forest infrastructure is added. Many forestry companies use LiDAR in this way, and a number of councils are developing regional LiDAR, often in partnership with Land Information New Zealand.[114]

However, national LiDAR is not yet available, and it does not change the lithology that underpins the ESC. A range of sediment-prediction models and tools are also being

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[110] https://lris.scinfo.org.nz/layer/48076-nzlri-land-use-capability/

[111] Sediment sources and delivery following plantation harvesting in a weathered volcanic terrain, Coromandel Peninsula, North Island, New Zealand. Marden et al (2006). https://www.publish.csiro.au/sr/SR05092

[112] https://www.mpi.govt.nz/dmsdocument/32323-ESC-and-operational-planning-guidance

[113] LiDAR (Light Detection and Ranging) is a method for determining variable distances by targeting an object or a surface with a laser and measuring the time for the reflected light to return to the receiver. It is commonly used to make high-resolution maps.

[114] https://www.linz.govt.nz/data/linz-data/elevation-data

developed, particularly at a local scale, but considerable work is required to determine whether they are interoperable with the ESC.

Upgrading the ESC to incorporate finer-grained information and new tools is not straightforward, but remains an option to consider as science and information improve. Whether this would change the actions required to manage erosion and sediment for plantation forestry, given that site-specific planning is already required, is another matter.

Accuracy at a site-specific level

In addition to requiring 1:10,000 planning for earthworks and harvesting activities and 1:1,000 – 1:5,000 planning for forestry quarrying, a process was developed for remapping ESC polygons where a party disagreed with the ESC.[115] The process requires a party to:

- notify Te Uru Rākau – New Zealand Forest Service of their intention to request changes to the ESC
- instruct a suitably competent mapper to document the basis for reclassifying the land in question (ie, remap)
- get the remapping approved through quality assurance with Manaaki Whenua Landcare Research.
- Te Uru Rākau – New Zealand Forest Service must action any changes by having the ESC tool amended and, because the ESC is incorporated by reference in the NES-PF, notify the changes in the Gazette.

This is an expensive and time-consuming process for all parties, and no changes have been made in the four years since the NES-PF came into force. Te Uru Rākau – New Zealand Forest Service has received only one request for changes to the ESC, but is aware of instances of:

- forestry companies seeking resource consent for land that is not red zone when mapped at a 1:10,000 scale, to avoid the time and expense of seeking a change to the ESC
- councils agreeing, once land is remapped by a suitably qualified mapper, that resource consent is not required
- councils and other interested parties disagreeing with ESC zoning in specific instances, and seeking broader changes to the ESC (though any party may apply for remapping).

Suitably qualified mappers

There is a need to update the process for identifying suitably qualified mappers. A list of mappers identified through a formal process, updated in 2019, is available.[116] That list has not been updated, though Te Uru Rākau – New Zealand Forest Service has had enquiries from interested mappers.

Options are being considered, but as mappers would fall within the scope of 'forestry adviser' under the Forests (Regulation of Log Traders and Forestry Advisers) Regulations 2022, any new process will be developed in line with the new regulations.

[115] https://www.mpi.govt.nz/dmsdocument/28542-Process-to-update-the-NES-PF-ESC-on-a-case-by-case-basis
[116] Ibid

GLOSSARY

Afforestation	Afforestation is defined in the NES-PF as: (a) planting and growing plantation forestry trees on land where there is no plantation forestry and where plantation forestry harvesting has not occurred within the last 5 years; but (b) does not include vegetation clearance from the land before planting.
Climate Adaptation Act	Proposed legislation as part of the Government's Resource Management Reform programme that will seek to address complex issues associated with managed retreat from climate change effects.
Carbon forest/forestry	Has a similar meaning to plantation forest as defined in the NES-PF, except that it is forest that will not be harvested below a certain level of canopy cover. This type of forest is sometimes referred to as 'permanent forest'.
Environment	This document uses the RMA definition of environment which includes— a) ecosystems and their constituent parts, including people and communities; and b) all natural and physical resources; and c) amenity values; and d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) or which are affected by those matters
Exotic	Non-indigenous species of trees
Forest species	A tree species capable of reaching at least 5 m in height at maturity where it is located
Harvesting	Means: a) felling trees, extracting trees, thinning tree stems and extraction for sale or use (production thinning), processing trees into logs, or loading logs onto trucks for delivery to processing plants; but b) does not include— (i) milling activities or processing of timber; or (ii) clearance of vegetation that is not plantation forest trees
Indigenous	Species of flora or fauna, means a species that occurs naturally in New Zealand or arrived in New Zealand without human assistance
Land Use Capability (LUC)	Land Use Capability Classification is a system in use in New Zealand since the 1950s to try and achieve sustainable land development and management on farms. The system classifies all of New Zealand's rural land into one of eight classes, based on its physical characteristics and attributes.
National Environmental Standards (NES)	Provide central government the ability to prescribe technical standards, methods or requirements that apply immediately to regulated parties. Councils must enforce the standards to the extent of their powers.
National Policy Statement (NPS)	Direct councils on how to undertake their planning functions in relation to matters of national significance that are relevant to achieving the purpose of the RMA (for example, by setting objectives and policies that councils must implement in their policy documents and plans).

Plantation forest or plantation forestry	As defined in the NES-PF, it means a forest deliberately established for commercial purposes, being— (a) at least 1 ha of continuous forest cover of forest species that has been planted and has or will be harvested or replanted; and (b) includes all associated forestry infrastructure; but (c) does not include— (i) a shelter belt of forest species, where the tree crown cover has, or is likely to have, an average width of less than 30 m; or (ii) forest species in urban areas; or (iii) nurseries and seed orchards; or (iv) trees grown for fruit or nuts; or (v) long-term ecological restoration planting of forest species; or (vi) willows and poplars space planted for soil conservation purposes
Pruning and thinning to waste	Pruning plantation forest trees and thinning to waste involving the selective felling of plantation forest trees within a stand where the felled trees remain on site
Transitional forest	A particular type of exotic carbon forest which is intended to be transitioned from predominantly exotic to predominantly indigenous species over time, while maintaining a minimum canopy cover.

Acronyms

ERP	Aotearoa New Zealand's First emissions reduction plan
FTE	Full-time equivalent
LUC	Land Use Capability Classification
LUM	Land Use Map
NBA	The proposed Natural and Built Environments Act
NES	National Environmental Standards
NES-PF	National Environmental Statement for Plantation Forestry
NPS	National Policy Statement
NPS-FM	National Policy Statement for Freshwater Management
NPS-HPL	National Policy Statement for Highly Productive Land
NZ ETS	New Zealand Emissions Trading Scheme
NZU	The domestic unit created for New Zealand's ETS. One NZU corresponds to one metric tonne of carbon dioxide-equivalent emissions.
RMA	Resource Management Act 1991
SFM	Sustainable Forest Management
WRMP	Wildfire Risk Management Plan

Ministerial Inquiry into Land Uses associated with the mobilisation of silt and woody debris.

Submitter: **Stan Braaksma B.Agr.Sc.**

Soil Conservator - Land Management Advisor

Akura Nursery Team Leader - (Wairarapa Catchment Board - Greater Wellington Regional Council 1975 - 2019)

Past Chairman to Willow and Poplar Research Collective

Ballance Farm Environment Awards Finals Judge for 12 years, some Consultancy and Retired

Honorary member NZARM, Trustee on NZPWRT, Montfort Trimble Foundation

Farm Forestry Member - major interest in P.radiata, Cypresses and Poplar

Forest Syndicate Manager and Investor

Background

My CV to address this issue:

Land Use classification mapped at 1:10,000 scale for Farm Plans, the LRI National mapping of 1:63,000 was too coarse and failed to accurately isolate and locate areas of high erosion risk.

This evolved into a matrix of identifying areas of erosion risk, and developing systems of adequate treatments to mitigate or minimise the risk. Also assisted in the targeting of treatments on a catchment and region wide basis.

Following the 1990 and 1991 Tinui Floods, I developed a set of Guidelines of Managing Fragile Landforms, and while highly applicable to "Cyclone Gabrielle" this never went further with either Regional Council or Forest Companies. Those guidelines had earlier signalled that P.radiata was an inappropriate tree species to be used in severe gully and earthflow erosion sites.

I was Scheme Manager for the Maungaraki Catchment Scheme 1980 – 2018 (continuing), combining Scheme, Farm Plan and Roading conservation treatments into an integrated managed vegetation coverage, with excellent overlays of identified high risk LUC Units. (Digital maps available).

Advisor to Wellington Regional Council's Akura Nursery and managing for a consistent supply of mixed clonal material. Work included trial assessment of new breeding material for early introduction into nursery, along with culling poor clones out of the system.

As Team Leader to Akura Nursery , principal in establishment of an additional 13 ha of leased nursery land (irrigated) as a Business Unit. Under expansion development included establishment of a compound area allowing for greater commercial, processing, plant presentation, information and retail space and safe traffic flows.

Stoney Creek Land Management Inputs, this is now owned by GWRC as a protection/ production forest property.

Bio engineering Workshops for River Managers on the Wairarapa, Hutt and Otaki Rivers.

East Coast Forestry Project Workshops and consulting.

Marlborough District Land Management Overview, Wither Hills, Sounds Forestry practices, Wetlands and Wilding Pines.

Wairarapa Storm Events Reviews (1977, 1981, 1990, 1991, 2004 x 2, 2005, 2006 and the Waikanae – Reikorangi).

Alternative species and their suitability. Workshops and Presentations including promotion of use of the correct willow species (good willows) in river control and how to manage crack and grey willows (bad willows)

Native species preservation and bush condition scoring, major QE II Trust Covenants on Farms. Develop Akura Native species portfolio, seedling quality, contract growing and eco source seed collections (50+) species.

Management and Silviculture of a wide range of Forest species.

Consult and Advise to GWRC Planning and Consents on both Land Management and Forestry Matters. Advise on Forest Harvest and Planning practices. Noted poor forestry practices and alerted authorities to potential consent issues.

Working relationship with District Councils on roading erosion issues. Many joint projects established.

NES-PF Review and commentary. Good liaison with local Forest companies in Forest Enterprises, Juken NZ, Forest 360, NZ Forest Works and Farman Turkington along with many Forest contractors.

Collaboration of Wairarapa Forest growth data and proofing the P.radiata calculator with the late Leith Knowles (FRI)

Lidar photography interpretation and signaling High risk landscapes and areas.

Well travelled over most of NZ.

In Retirement reports to Canterbury, Hawkes Bay and Northland Nurseries, GWRC Hinakura hill road disruption and Nelson Matai Catchment integration.

Identification of Risk Factors

If sheep and beef and dairy farms are required to do Farm and Environmental Plans at presumably 1:10,000 scale then forestry should be required to do the same.

Mapping at the above scale would identify areas of potential risk prior to planting, and with consultation and advice, allow more informed decisions on appropriate treatment. This mapping would also identify areas for protection planting or consolidation of native regeneration.

LUC classes already have Dry Matter pasture production tables.

Sednet developed annual sediment yields of silt/sand attributable to LRI Units. I'm sure this could more usefully be applied to 1: 10,000 LUC map units and highlight more accurately the areas of extreme sediment loss on a property.

LRI units also developed a guide of site index figures for P.radiata, but LUC tables could be developed for Site Index, Mean Annual Increment, and perhaps even Carbon fixation/annum.

Modern imagery has offered much improved clarity, including infrared to accentuate colour differentiation of different tree species. Oblique imagery can now also allow interpretation of height and diameter of individual stems, allowing remote sensing of volume timber / carbon gains.

Lidar techniques provide a clear view of the underlying topography, allowing for early identification of at-risk landscapes with a bit of ground proofing.

A major risk to tree establishment and growth is animal pests. Deer, wild cattle, pigs, goats, possums and hares require a deliberate programme of culling or removal, perhaps total removal by 2050. Continuing browsing takes a heavy toll on native regeneration and understory species.

Major exotic weed species also should be controlled or minimized of which wilding pines, blackberry, Old Man's Beard, Pampas and Woolly Nightshade come to mind.

Planted tree cover species must remain in a healthy and effective state. To this end P.radiata should be managed either under a pruning (Intensive) regime, or at least a thinning (Framing) regime to allow greater space between trees with improved tree form selections, piece size and greater individual rooting stability. Thinning operations allow this lesser diameter material to rapidly disintegrate within the forest floor. Untended forests invariably produce smaller piece size, more defect log and much higher percentages of reject log slash left on site post-harvest. These blocks also carry a poorer health status,

with a higher potential to promote diseases allowing spread to well managed P.radiata timber crops.

Right Tree in the Right Place for the Right Reason

I recently presented a powerpoint master class to NZARM conference, with workshop sessions labelled "The Right Tree in the Right Place for the Right Reason". This is due to be posted on the NZARM website. Here I challenged the participants, about the discussions and background to selecting appropriate species for the job.

As stated P.radiata is an extreme risk species when placed into severe gully and earthflow erosion sites. It is also a suspect performer in high fertility alluvial wet flats. Elsewhere it has proven to be highly suitable for erosion control of hill country catchments. I maintain that it is a species that needs management for best sustainable land stability and timber production. New Zealand is a major player on the world softwood market, our temperate climate zone presents a huge advantage in the annual volume gains/ha/annum. P.radiata is also an extremely versatile wood product suitable for a wide range of building and wood use solutions.

There is room to establish a reasonable resource of alternative species, again spreading the risk against promotion of a single species softwood timber resource. Considerable research and trialling suggests potential for Acacia, Eucalyptus, Douglas Fir, Redwood, Cyperus and Poplar. Initiatives in native species in Kauri, Totara, Rimu and Beech come to mind.

Part of this is understanding the mode of growth. Is it a primary invasion species such as P.radiata, Gorse, Tree Lucerne or a species, as is common with many natives, which successfully follow the primary invaders in their establishment.

A standout is in the bred-for-purpose hybrid tree willow, developed from Salix alba x matsudana parent crosses. Willows offer a fast growing root establishment with a high % of adventitious roots superior to all other species for binding fine sediments, especially in situations where there are strong erosive water flows on fine unconsolidated, or eroding soft hill weathered surfaces. Further Salix species crosses have been achieved.

Two willows introduced by previous settlers are Crack "Salix fragilus" and Grey "Salix caprea" willow have presented problems in lower alluvial flats and wetlands due to the amount of broken limb material that re-establishes in accumulating sediments. The soil conservation willows (bred-for-purpose species) have very low or no regenerative ability downstream.

On highly erodible soils rapid tree establishment and growth is needed to arrest the rate of erosion. Species selected may have an element of persistence or weediness, in features such as regrowth on toppling or washout, nitrogen fixing (raw sub soils), ability to sucker and or coppice, or have an element of seeding ability. Any vegetation that establishes can also become a protected cover for regenerating native species.

Poplar also possesses potential as a timber resource. Its origins for NZ use have been uniquely as an easy to establish soil conservation species to mitigate moderate slip, earthflow, gully and streambank erosion. They can be established direct into sheep and beef grazing pasture lands without the need to destock the area. Poplars generally display erosion site control within five years of establishment. Of note is the recorded root strength which is up to three times that of P.radiata roots. While selections have been made for soil conservation purposes, many clones have been selected for vigour, form (straightness) and non-brittleness. Straight log form on poplars offers potential for timber production.

There is a vocal element within NZ population which favours native species for erosion control. Sadly, natives are generally slow growing, with poor root soil binding ability in our soft rock types, and which struggle to establish in continuous soil degradation sites. Best results are to create a nurse crop which achieves a more stable platform for native seedling regeneration. This slow process is also an opportunity for fast establishing exotic weed species.

Best Management Practices

As stated P.radiata is deemed to be an inappropriate species for severe gully, and earthflow erosion areas.

P.radiata is best established as a managed tree species, with a potential economic return from carbon, and timber, while achieving erosion control and catchment protection. Recognised are the Intensive (pruning and thinning) and the Framing (thinning) regimes. Under LUC mapping deeper soils on easier slopes (good farmland) present the opportunity to grow good tree volumes related to growing larger diameter pruned logs. Thin skeletal soils are a higher risk for tree stability and generally produce reduced height and diameter increments/annum.

Managed forests upon harvest present less % of waste material left post harvest than unmanaged stands. Lower volumes and lesser quality log material present a greater challenge to produce high harvest volume runs /day. Invariably these lower quality and volume logs are produced on very steep marginal hill country which carries higher risk to slash stability.

Many blocks and total property plantings are carried out as one age group. This means the whole area arrives at harvest all at once. A smart NZ should introduce split age plantings and achieve no more than 15 – 20% of a catchment exposed to harvest at any stage. 80% of a catchment area cover should be in Age 5 – 30 year.

In new projects there is a chance to mandate or teach the forest establishers that high risk areas may need a different treatment such as protection planting of buffer or riparian areas, setbacks for P.radiata and removal of browsing animal pests. For original blanket P. radiata planted areas just harvested, there's a chance for a reset planting programme.

Second time round may require implementation of a programme of active control of wilding pine if it establishes in riparian buffer zones.

Alternative species can offer carbon and timber opportunities on a much longer rotation. Eucalyptus fastigata and Sequoia sempervirens are two long-lived species, running for 80-120 + years, with the potential to store more carbon /ha than P.radiata. P.radiata is restricted by maximum woodlot basal areas of around 90 m2/ha with the current GF 19 seed stock. Redwood has basal areas recorded at 400m2/ha at 80 years of age. Both these species present a selective harvest option, with eucalyptus seedling regeneration and redwood re-coppicing on the stump both capable of restocking the forest population.

Windows of Opportunity

While the P.radiata industry has taken a battering, not least from the media, NZ is a lead country by international standards for producing fast grown high quality softwood conifer timber. P. radiata timber is versatile, suitable for a multiple range of uses from structural building, cross lattice wood components, clear wood flooring and furniture timber. A number of recent timber treatment developments may remove the stigma of requiring CCA treatments.

Waste slash left on harvest sites could be chipped and pelletised on site as a new coal, this at least will be realised as a renewable energy source. Any extra cost in producing this material could be subsidised by the on-going coal or fossil fuel burners in NZ

Government has recognised that our timber industry is strongly aligned with the one P,radiata species. There is recognition that under climate change we are vulnerable to new pest and disease risks. As a production forest syndicate manager, I have seen the impact of red needle cast on forest health. With a warming climate dothistroma sits as a constant threat to forests in the Wairarapa and further south in NZ.

Under the new industry transformation plan, there is a desire to move to have 20% of forest area in alternative species. Hopefully we will see increased investment to support the breeding, selection and management of these.

I see a large potential for poplar planting river berms on floodplains, where lines of clean pruned stems collect and trap river debris and driftwood along the river berms and buffer strips. You only have to observe how well shelterbelts achieve filtering flood waters, with these areas also encouraging silt deposition. These techniques could be targeted to flood plain valleys such as in the Esk Catchment and are also strongly applicable to the abraided Canterbury River buffer systems.

The much underated and under-utilised tree willow is the only plant for the first line of defence and protection against eroding gullies and waterways. It is extremely versatile, growing in alpine gravels and also used for protection on lowland alluvial river banks.

Even regions active in crack willow removal have failed to reinstate judicious replanting of river banks with bred-for-purpose good willow species. This is a vital component of future catchment protection works.

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Using the concept of silvicultural systems to choose forest management options for highly erosion-susceptible land

Mark Bloomberg
Adjunct Senior Fellow
Te Kura Ngahere |New Zealand School of Forestry

Introduction

Commercial plantation forestry has been found wanting on some highly erosion-susceptible sites in many parts of New Zealand, including Tairāwhiti and Hawkes Bay. Here "Commercial plantation forestry" means short-rotation even-aged forestry, usually with radiata pine, with clearfell harvesting of the mature crop often over large areas.

At the same time, many of these commercial plantation forests were established because the existing pastoral land use resulted in unsustainable erosion rates, downstream sedimentation, and flooding. A resilient and complete forest cover is the best land-use option for these highly erosion-susceptible sites.

Then the next question is, "how do we achieve a resilient and complete forest cover"? As foresters, we would approach this problem in terms of the concept of **silvicultural systems**, defined as:

"… a planned program of treatments during the whole life of a stand designed to achieve specific stand structural objectives. This program of treatments integrates specific harvesting, regeneration, and stand tending methods to achieve a predictable yield of benefits from the stand over time."

Note that here, benefits are not just timber or revenue but all the other benefits that forests can provide, including soil conservation.

Why use the concept of silvicultural systems? Forestry is a long-term business, and once a tree crop is established, this necessitates a "planned program of treatments" during the whole life of a stand. To ignore this can lead to unintended and undesirable results. For example, large-scale blanket afforestation of erosion-susceptible land with radiata pine was a logical response after Cyclone Bola. However, the common silvicultural system with radiata pine is even-aged short-rotation forestry with clearfelling. Three decades later, this system led to the clearfelling of very large areas of erosion-susceptible land, with predictable consequences.

If we are to achieve a resilient and complete forest cover, we should therefore ask not what tree species or harvesting methods should be used. Instead, we should ask what silvicultural systems we should use, why we should use them, and where they should be used.

Options for silvicultural systems

Here are four candidate silvicultural systems that have been proposed for erosion susceptible land in Tairāwhiti and Hawkes Bay:

- Short rotation even-aged forestry with clearfelling, but with best practices and limitations on clearfell coupe size and proportion of catchment area harvested at one time.
- Protection-Production forestry (exotic or indigenous species chosen to maximise rapidly-establishing and resilient forest cover, with potential for limited harvesting to generate revenue and maintain stand structure and health). Protection-Production forestry could

include planting exotic forest species with a later managed transition to indigenous forest, but the feasibility of this transition at scale is not yet demonstrated.
- Indigenous planting—permanent indigenous forests established by planting indigenous seedlings onto open sites.
- Regenerate permanent indigenous forests through managed succession on lands retired from pastoral grazing.

How do you choose the right systems for the right sites? One difficulty in forestry is that forests are expected to meet multiple criteria simultaneously! For highly erosion-susceptible lands, here are some criteria we expect forests to meet (this list is not exhaustive, and you may be able to come up with a better one):

1. **Fast growth**—trees must grow fast and occupy the site rapidly (deep roots, full canopy cover). The classic photo sequence of radiata planting in Tairāwhiti shows how fast establishment of a forest canopy and root system is needed to stabilise "badass gullies" (Marden 2018). Trees with slower growth are more likely to be undermined by continuing erosion, toppling into expanding gullies or being swept away by a landslide.

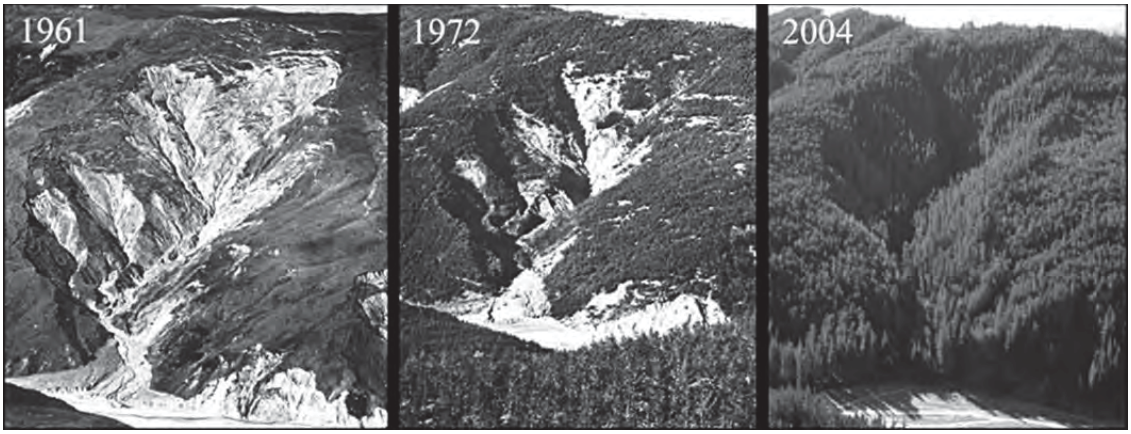

Figure 1. Severely degraded gully stabilised by planting exotic pines. Marden (2012).

2. **Biodiversity**—many people seem to think that planting or regenerating native trees and native forests is the answer to both soil conservation and biodiversity issues. Can we have our cake and eat it too?
3. **Resilience**—is most important in my view. Once you have established a stable forest cover, it should ideally be self-maintaining and resilient to protect the soil. Rotational clearfell forestry does not fully meet this criterion since it has a "catastrophic" loss of forest structure and biomass once a rotation when clearfelled.
   At the same time, the self-maintenance of a silvicultural system is not guaranteed. The job is not finished once the tree crop is established—weed and pest control, maintenance of fences, fire protection, and management of disease threats are ongoing commitments. Regeneration of the forest when older trees die or are destroyed (wind, landslide, wildfire) is not always assured. Therefore, the forest may require active management to ensure the regeneration of the next crop of trees. All these interventions require funding, so there is a link between forest resilience and the next criterion (financial return).
4. **Financial return**—depends greatly on establishment cost, rotation length and potential for timber, carbon and other revenues. The financial return also depends on the discount rate (annual investment return) the grower expects. Commercial forestry investors generally

expect a 6 -10% discount rate. We need to use a lower discount rate for protection forestry or else value avoided erosion and include this in the discounted cashflow calculation (Yao et al. 2019). If you are going to accept a lower discount rate or account for avoided erosion as a benefit, then the age-old question of "who pays?" comes to the fore. In contrast, a 6 -10% discount rate is a demanding standard for financial performance that favours conventional plantation forestry.

As mentioned under the previous criterion, a sustained income in perpetuity also contributes to resilience. A silvicultural system that depends on continued funding from taxpayers or ratepayers will compete with many other public services (e.g. health, education) for funding and may be compromised by budget cuts when governments are short of money.

5. **Amenity**—as defined in the RMA. Landscape, heritage and cultural values are accounted for here. Most people's expectations of forests are emotionally based. "Amenity" is a catch-all term for these expectations and others based on heritage and culture. Heritage and cultural values are prized in Tairāwhiti—but these values may come at a cost in terms of protection, restoration or enhancement.
6. **Feasibility**—how easy is it to establish and grow a crop? This question sounds trivial but is actually quite important. Most people do not understand that not only is it 10 times more costly to grow indigenous vs exotic forests, but it is also 10 times more difficult as well. I'm speaking from experience here! Indigenous seedlings can require more careful handling in the nursery, during transportation to the planting site, and when planting. Grass, weed, and pest control take much more effort. Therefore, indigenous trees' survival rates tend to be lower because weed and pest control are critical to successful forest establishment.
7. **Regional economy**—this criterion accounts for a combination of benefits (employment, regional income and development) and disbenefits (largely related to impacts of landslides and sediment/slash discharges on the built environment and human wellbeing and safety). Both the benefits and the disbenefits are of major importance in Tairāwhiti.

How can we evaluate our four candidate silvicultural systems using these seven criteria? This problem can be dealt with by "multi-criteria decision making", which aims to determine the best alternative by considering more than one criterion in the selection process.

How to resolve a multi-criteria decision for forestry?

Unfortunately, multi-criteria decision-making has received far more attention in the overseas forestry literature than in New Zealand. To meet this lack of NZ-relevant studies, I have created an example using the Analytic Hierarchy Process (AHP, see https://en.wikipedia.org/wiki/Analytic_hierarchy_process). I am not an expert in decision theory, so I've used AHP because it is reasonably simple to understand and explain.

AHP requires the creation of decision weights for your chosen criteria (e.g. criteria 1-7 above). The decision weights show the relative importance of each criterion for your final decision. The weights must sum to 1 and are internally consistent, i.e. if you say A is more important than B, and B is more important than C, then A must be more important than C also. Using a public-domain AHP spreadsheet (Goepel (2013), https://bpmsg.com/new-ahp-excel-template-with-multiple-inputs/), I came up with my own weights as follows:

Table 1. AHP weighting for 7 criteria

	Criteria	Comments	Weights
1	Fast growth, occupy site	Closed canopy, deep interlocking roots	0.23
2	Biodiversity	Indigenous species	0.04
3	Resilience	Stable forest structure and biomass	0.35
4	Financial return	Cheap, profitable	0.08
5	Amenity	Culture, heritage, aesthetics, emotion	0.03
6	Feasibility	Easy to grow, reliable growth	0.18
7	Employment, regional economy	Economic multipliers vs slash, silt impact	0.09
	Total		**1.00**

Note my high weighting on the soil conservation criteria (fast growth, stand resilience). Biodiversity and amenity get a low ranking because while these may be important to people, Tairāwhiti faces a major problem right now—some may describe it as existential. How do we maintain livelihoods and protect people and the built environment in the face of increasingly frequent major landslide storm events? If we do not focus on this problem, we risk falling short in trying to solve it.

The second part of the AHP process is to rank the four candidate silvicultural systems according to each decision criterion. This will require that each system be given a score on how well it meets each of the seven criteria. Table 2 shows my evaluation based on a good general knowledge of silvicultural systems. A score of 9 means the best, and the lowest score (e.g. 1) means the worst. For example, compare the score of commercial forestry for financial return (9) versus its score for amenity (1). Again, if you have evidence, you can change these scores as you see fit.

Table 2. Scores for each silvicultural system according to criteria 1-7.

	Criteria and scores						
Choices	Fast growth	Biodiversity	Resilience	Financial return	Amenity	Feasibility	Regional economy
Commercial forestry	9	3	2	9	1	9	6
P-P forestry	7	4	9	5	3	7	9
Plant Indigenous	4	7	6	1	9	5	3
Regen. indig.	2	9	6	1	9	3	3
Sum	**22**	**23**	**23**	**15.5**	**22**	**24**	**21**

A weighted score is then calculated for each candidate system by multiplying its score for each criterion (Table 2) times the weighting for each criterion (Table 1). The best choice is the system with the highest sum of weighted scores. Table 3 shows the results using the criteria weightings in Table 1.

Table 3. AHP Weighted scores rankings using weights in Table 1

Weighted ranking		Criteria and weights							
		0.23	0.04	0.35	0.08	0.03	0.18	0.09	1.00
Candidate systems	Rank	Fast growth	Biodiversity	Resilience	Financial return	Amenity	Feasibility	Regional economy	Total
Commercial forestry	2	2.05	0.12	0.70	0.72	0.03	1.62	0.54	5.78
P-P forestry	1	1.60	0.16	3.15	0.36	0.09	1.26	0.81	6.62
Plant Indigenous	3	0.91	0.28	2.10	0.08	0.27	0.90	0.27	4.54
Regen. indig.	4	0.46	0.36	2.10	0.08	0.27	0.54	0.27	3.81
Sum		5.02	0.92	8.05	1.24	0.66	4.32	1.89	20.75

This table suggests that a mixed production-protection strategy would be best on land where soil conservation criteria (fast growth, resilience) have the most weight.

What weights might favour the current commercial forestry system that is the rule for NZ plantation forests? Table 4 shows that the weights would not have to change much—the weight on finance would only need to increase from 0.08 to 0.18, with resilience decreasing from 0.35 to 0.25, and commercial forestry would be the superior option, although not by much.

Table 4. AHP Weighted rankings with increased weight on finance criteria

Weighted ranking		Criteria and weights							
		0.23	0.04	0.25	0.18	0.03	0.18	0.09	1.00
Candidate systems	Rank	Fast growth, occupy site	Biodiversity	Resilience	Financial return	Amenity	Feasibility	Regional economy	Total
Commercial forestry	1	2.07	0.12	0.50	1.62	0.03	1.62	0.54	6.50
P-P forestry	2	1.61	0.16	2.25	0.81	0.09	1.26	0.81	6.18
Plant Indigenous	3	0.92	0.28	1.50	0.18	0.27	0.90	0.27	4.05
Regen. indig.	4	0.46	0.36	1.50	0.18	0.27	0.54	0.27	3.31
Sum		5.06	0.92	5.75	2.79	0.66	4.32	1.89	20.04

Discussion and Conclusions

1. AHP does not provide a single, clear answer to the choice of silvicultural systems. The ranking of the silvicultural systems here depends on the weights, which are determined by the values and preferences of the person undertaking the AHP process. I assumed that soil conservation criteria were most important for this exercise, followed by feasibility and the regional economy.
2. The AHP also depends on the scores for each system in terms of the seven criteria. Some may disagree with my scores, but I can offer evidence and sound reasoning to justify the scores that I have used.
3. The analysis suggests that indigenous forestry planting or regeneration do not compete with exotic forestry systems on soil conservation (fast growth), feasibility and financial grounds.
    a. They are expensive to establish (native forests $30,000/ha, radiata pine $3000/ha) and slow-growing, and we have a long way to go to make these systems as feasible as planting with exotic species.

   b. Even if they contribute to the regional economy through avoided erosion, they do not have the employment and regional development values that come from forests that can be harvested for wood. Unless Kyoto-compliant, indigenous forests will not earn income from carbon credits. To my knowledge, other possible income sources (tourism, honey, forest foods) are unproven at scale.
   c. Finally, even if Kyoto-compliant new indigenous forests can earn carbon revenue, their slower growth means they are unlikely to attract commercial investors (Weaver 2021), so their establishment will depend on public funding. On the plus side, indigenous forests sequester carbon steadily for at least 50 years. The carbon revenue may help to fund the maintenance that indigenous forests need in the face of challenges from animal pests, invasive organisms, fire, wind, and landslides.

4. This submission addresses the "what", "where", and "why" of silvicultural system choice. It does not address the "how"—that would require a separate submission. However, I have researched alternative silviculture systems in radiata pine and indigenous forest (see Bloomberg et al. 2019, Ganivet et al. 2017 and https://www.nzffa.org.nz/farm-forestry-model/the-essentials/roads-earthworks-and-harvesting/reports/report-an-alternative-to-clear-felling-radiata-pine/video-target-diameter-harvesting-at-woodside/). I have also researched soil and water management in commercial plantation forests (Bloomberg 2015, 2022). Based on this experience, I make the following tentative suggestions:
   a. The choice of commercial forestry vs protection-production forestry seems to hinge on a change in weighting between resilience and financial criteria. Are the owners of commercial forests able and willing to change their emphasis from financial criteria to forest resilience in managing their forests?
   b. For stable land (LUC Class 6e, Yellow and some orange ESC[1]), commercial forestry may be the best option with best practices and limitations on the clearfell coupe size and proportion of the catchment area harvested.
   c. For highly erosion-susceptible land (LUC Class 7e and 8e, some orange and all red ESC), protection-production forestry systems, with carbon revenue for new plantings and/or some potential for wood harvesting, appear to be the best option.
   d. Therefore, a key task is the identification of highly erosion-susceptible land. While the current ESC system does this identification, the ESC is mapped at too coarse a scale to identify highly erosion-susceptible land at a fine enough resolution to make operational decisions about forest management. There needs to be a systematic, complete, and consistent map of highly erosion-susceptible land for Tairāwhiti and other regions in New Zealand with similar problems.
5. The above suggestions are tentative because finding the best silvicultural systems for different land classes will involve a lot of trial and error. This task has not been tried on a large scale in New Zealand exotic forests. Alternative silvicultural systems have been under-researched when compared with the dominant paradigm, short-rotation even-aged radiata pine forestry. Developing feasible silviculture systems will take time, effort and money at the research and operational levels. Government, iwi, and communities need to understand this and be patient! Even if the correct silvicultural systems are adopted, the problems of flooding and sediment/slash discharges will not go away in a hurry.

[1] ESC= erosion susceptibility classification, as classified under the National Environmental Standard for Plantation Forestry (NES-PF). The ESC classifies land according to a four-colour 'traffic-light' system, where green=low, yellow=moderate, orange=high and red=very high ESC.

6. Further to the above point, one protection-production silvicultural system is being extensively planted in New Zealand. This is permanent exotic forestry (again, dominantly with radiata pine). The intention is that these forests will not be clearfelled. Instead, they will be transitioned to permanent indigenous forests long-term. Adam Forbes has researched the transition process (see https://www.forbesecology.co.nz/research/), but he is on record as saying that there are currently no proven methods for transition on a large scale[2].
7. Using silvicultural systems and multi-criteria decision-making may seem academic and theoretical. However, both concepts are used in forestry decision-making overseas for good reasons. Forests can be managed in many different ways and for many different objectives. Faced with complex and conflict-ridden decisions about forest use, foresters have developed ideas to handle them in ways that are objective and explicit—that is, the reasons for the decision are clearly set out, allowing for discussion of criteria and evidence for the decision.
8. It could be argued that the lack of use of these techniques in New Zealand is due to our polarised, black-or-white approach to land management—pastures and horticulture in the foreground, high-producing wood factories in the middle ground, and a conservation estate out back. Since at least the Tolaga Bay event of 2018, but probably before, the need for a more nuanced approach to forestry and land management has become apparent. Until the need for this nuanced approach is recognised, the discussion will be dominated by advocates for simple one-dimensional solutions ("plant more native forests", "tougher enforcement under the RMA", "no more clearfelling"). In a small way, I have attempted to advance the discussion beyond this simplistic level towards one that recognises the complexity of the problems we face and the trade-offs we must make to solve them.

Recommendations

1. Decisions on forest management and land use should be based on multiple criteria. Decision-making should use methods that are transparent and based on evidence. Criteria should have broad acceptance, noting that some disagreement is inevitable. Single-issue analysis and solutions must be avoided.
2. Decision-making about forests should be about the choices of silvicultural systems. These choices should be informed by how well they meet the agreed decision criteria.
3. Where short-rotation even-aged forestry with clearfell harvesting is sustainable, best practices and limitations on clearfell coupe size and proportion of catchment area harvested at one time must be applied strictly and without exception.
4. For highly erosion-susceptible land, alternative silvicultural systems are required that meet agreed criteria. Government and forest investors must commit seriously to research and operational testing of alternative silvicultural systems. While regenerating or planting indigenous forests are popular choices, these systems have serious drawbacks. Alternative systems with fast-growing exotic species (including radiata pine) are urgently required.
5. The ESC is mapped at too coarse a scale to identify highly erosion-susceptible land at a fine enough resolution to make operational decisions about forest management. There needs to be a systematic, complete, and consistent map of highly erosion-susceptible land for Tairāwhiti and other regions in New Zealand with similar problems.

[2] https://www.stuff.co.nz/environment/climate-news/125508000/carbon-farmers-bought-swaths-of-nz-promising-to-create-native-forests--but-researchers-doubt-it-will-work

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Proposal for a Continuous Cover Forestry (CCF) Fund

Author: David Hall, Climate Policy Director, Toha.

Adapted from: David Hall & Sam Lindsay (2020). *Scaling Climate Finance: Forest Finance*. Mōhio Research: Auckland.[1]

Summary

1. The Continuous Cover Forestry (CCF) Fund is a proposed impact equity instrument which acquires forestry assets for management under CCF principles, so that harvesting is limited to selective felling or small coupe harvests. Consequently, the CCF Fund is designed to precipitate a shift toward more sustainable forestry management, mobilise capital markets for an impact-oriented investment asset, and create an 'exit route' for forestry companies that cannot continue to clear-fell harvest due to greater regulatory stringency or loss of social licence.
2. CCF is a promising land-use option as part of a nature-based recovery for Te Tai Rāwhiti. CCF will *not* be appropriate for *all* sites, but, where CCF is technically and economically feasible, it offers the opportunity to continue forestry production while significantly reducing negative impacts on local environments and communities.

Context

3. Continuous cover forestry (CCF) refers to forest management systems, such as selective harvesting or small coupe felling, that maintain a continuous canopy cover throughout the practice of timber extraction.
4. Promotion of CCF systems is identified as Action 7.2 in the Forestry and Wood Processing Industry Transformation Plan (ITP). Work is currently underway to address critical knowledge gaps and establish forestry trials.
5. CCF is relatively rare in New Zealand. Most plantation forestry is managed by clear-fell systems. However, there are examples of CCF in New Zealand which can be learnt from (see **Appendix**). Also CCF systems are more common in other parts of the world, including Europe through the Pro Silva movement.
6. Because CCF systems retain an ongoing presence of canopy cover, root structure and forest habitat, some of the environmental harms of clear-fell harvest systems can be avoided or minimised. CCF can result in reduced incidence of sedimentation and erosion, reduced habitat disruption for native flora and fauna, and reduced mobilisation of forestry debris. CCF may also produce greater ecological resilience due to its uneven-aged forest structure and frequent use of diverse tree species, which reduces the risk of significant forest loss from fire, disease or windthrow.
7. These attributes make CCF a potential substitute for conventional clear-fell forestry at *some* sites in Te Tai Rāwhiti. It must be stressed that the appropriateness of CCF can

[1] This report was an output of the Climate Innovation Lab, a co-design process supported by ANZ, involving representatives from the investment, forestry and research sectors.

only be determined on a site-by-site basis, because at some sites the transition from clear-fell to CCF may be impractical, so the environmentally optimal land use might be unharvested native forest. However, where CCF is viable, these systems may reduce the environmental impacts of plantation forestry while preserving ongoing opportunities for timber harvesting.

8. CCF faces multiple barriers to implementation at scale. These include:
    - an unwillingness among forestry-sector incumbents to accept a reduced rate of return by transitioning forest assets from clear-fell to CCF;
    - a lack of technical expertise in selective harvesting;
    - limited access to specialised harvesting equipment;
    - cultural and institutional inertia (or path-dependencies) which lock-in clear-fell systems, such as optimisation of wood processing for standardised *Pinus radiata* logs; and
    - actual or perceived risks of an unfamiliar silvicultural system by land- and forest-owners.
9. However, once a forest is being successfully harvested under a CCF regime, it is an attractive asset from an investor perspective.[2] Its advantages include:
    - CCF delivers a stable cash yield, like 'clipping the coupon' on a bond, with less exposure to timber price fluctuations than clear-fell forestry.
    - CCF produces larger, more valuable trees and a higher proportion of saw logs, which achieve a higher price per m3.
    - CCF grows and maintains the capital value of the forest in perpetuity.
    - CCF can generate higher carbon yields under stock change accounting in the Permanent Forest Category than plantation forestry otherwise can under averaging accounting.
    - Transformation to CCF brings forward cash flows because of heavier thinning in early years.
    - CCF minimises the costs of replanting by relying on natural regeneration to establish replacement trees.
    - Ongoing management and harvesting creates more stable job opportunities.
    - Additional costs from management and harvesting are not prohibitive once the environmental and social benefits of CCF are taken into account, especially if ecosystem services like biodiversity improvement and avoided erosion are monetised.

Proposal

10. A Continuous Cover Forestry (CCF) Fund is designed to leverage the positive investment attributes of CCF in order to overcome the transition barriers. It uses sustainable finance to induce a transition in forestry management approaches in the East Coast.
11. The CCF Fund's theory of change is to focus on shareholders as a critical lever for change in East Coast forestry. By creating an investment opportunity that strikes a better

[2] McMahon, P. and Sarshar, D. and Purser, P. (2016). *Investing in Continuous Cover Forestry*. Report prepared by SLM Partners.

balance between social, environmental and financial returns, the CCF Fund crowds in impact-oriented shareholders whose risk and return expectations are well-aligned with CCF. Consequently, it also crowds out shareholders who are singularly focused on financial returns and indifferent to the social and environmental harms of clear-fell forestry on highly erodible land.

12. The CCF Fund uses blended finance – i.e. a combination of structured public and private finance – to create a tiered funding pool that purchases forestry assets with the intention of transitioning into CCF systems. Government capitalises the junior tranche, which provides investors the confidence to capitalise senior tranches.
13. The primary focus of the CCF Fund's investment strategy is harvested forest land which is due for restocking, and recently planted sites (e.g. planted within last ten years). In both cases, the transition to CCF is relatively straightforward and a positive return on investment can be achieved through good forest management.
    - A secondary focus for the CCF Fund is mature even-aged stands which were intended for clear-fell harvest, but cannot be harvested due to environmental, social and regulatory factors. Conversion of mature stands to CCF is technically challenging and therefore likely to incur higher costs and risks. Consequently, such assets will likely need to be publicly funded as a harm avoidance strategy, rather than solely on the basis of expected financial returns. Nevertheless, a vertically integrated CCF Fund is likely to accumulate the skills and equipment needed for such transitions, so the provision of public goods should be included in its strategy.
14. Existing economic analysis of CCF demonstration sites in New Zealand give reasonable confidence of positive returns on investment from CCF assets under existing settings (see **Appendix** below). All else being equal, financial returns are likely to be lower than clear-fell systems, but this is partly because the latter do not pay the full costs of production. Many of the environmental and social costs from clear-fell harvesting are externalised, which include the costs of erosion and sedimentation associated with earthworks and harvesting, the production of forestry debris and its impacts when mobilised by flood events, and the total loss of habitat for native flora and fauna when harvesting occurs. If clear-fell forests were compelled to pay for those costs, or if CCF forests were remunerated for their relative benefits, then the economics would shift in favour of CCF.
15. If Cyclone Gabrielle results in new regulations or penalties, or greater stringency and enforcement of existing regulations and penalties, then these externalities will be (at least partially) internalised. Consequently, many clear-fell forest assets are likely to become uneconomic and/or unharvestable, effectively becoming stranded assets. If forestry investments are forfeited and abandoned, this creates future challenges and risks for land management, because these abandoned forests are likely to be maladaptive and hazardous. In this context, the CCF Fund offers an 'exit route' for such forests, which might be sold at a discount to the CCF Fund for transition into an appropriate management system. This could help to defuse industry resistance to

stronger regulation of clear-fell forestry on erodible land, because forestry companies at least have an option to minimise losses.[3]

16. Government support for the CCF Fund is likely to be essential. The CCF Fund is designed to alleviate total liabilities to government by crowding in private finance, deploying public finance as equity rather than grants, and using productive forestry systems to address multiple policy goals. However, because the current forestry sector is dominated by clear-fell systems, a transition to alternative systems will require a pro-active market-shaping approach by government. This support need not be indefinite, because CCF systems can be profitable and self-sustaining over the long run, but support is needed to achieve breakthrough for innovative forestry systems.
17. The proposed CCF Fund uses blended and structured finance to crowd in impact-oriented investment. Government investment is used to capitalise the CCF Fund's junior tranche, which absorbs a higher level of risk in order to facilitate a transition in forestry management that supports multiple policy objectives including climate adaptation, biodiversity, water quality, and long-lasting carbon storage. The senior tranche is capitalised by private capital markets, specifically impact-oriented institutional investors who are actively searching for opportunities to combine positive financial returns with a strong alignment to net-zero, climate-resilient, nature positive outcomes. With this equity-based structure, private capital markets can do the heavy lifting of capitalisation, while government can achieve multiple policy objectives by taking an equity stake that (unlike grant funding) creates revenue opportunities over the long run.
18. Another critical enabler of CCF systems is a biodiversity payment which enables a shift from *Pinus radiata* to high-value native timber species, thereby increasing the financial returns from timber as well as the co-benefits for biodiversity. This payment could be operationalised by various instruments, such as biodiversity credits, payments-for-ecosystem-services or ecological fiscal transfers. The rationale is as follows:
    - Although CCF of *Pinus radiata* is economically feasible (see **Appendix**), the economics are improved if continuous-cover forests transition into high-quality, high-value timber species, including native timber species.
    - Native timber species have slower growth rates in the early years, which reduces the scale of potential revenue from carbon markets such as the Emissions Trading Scheme, and also delays the opportunities for harvesting.
    - Consequently, native forests face a liquidity challenge in the early phases, with limited opportunities for cashflow to pay dividends, service debt, or fund forest management. Although growth rates might be increased through improved forest management and genetics, the slow initial growth rates of native tree species is a biophysical constraint with implications for economic viability.
    - A well-designed biodiversity payment, however, would create liquid cashflow when it is needed most. The early phase of forest establishment, when growth

[3] Sally Gepp, Madeleine Wright & David Hall (2019). *A Review of the Resource Management (National Environmental Standards for Plantation Forestry Regulations 2017*. Report prepared for Environmental Defence Society (EDS) and Forest & Bird. Retrieved from: http://www.eds.org.nz/assets/pdf/Review%20of%20NES -PF%20FINAL.pdf

rates of native trees are slowest, is also the phase when the biodiversity improvements are greatest, when native tree species succeed over exotic grasses, shrubs and trees. A well-designed biodiversity payment could reward the rate of change in species composition toward indigenous species dominance, which means that the biodiversity payment declines while the carbon revenue increases. This also means that the funder's liabilities are time-limited, rather than extended into perpetuity.

- In this way, a biodiversity payment can address financial barriers for CCF by creating liquid cashflow to pay dividends, service debt or fund forest management in the early years, before carbon revenues and harvesting opportunities are realisable.

19. In sum, a CCF Fund would make a valuable contribution to a nature-based recovery in Te Tai Rāwhiti, while also building the skills and capabilities to catalyse a nationwide shift to alternative forestry systems. Through a cornerstone investment, the government could mobilise private capital markets to support revenue-generating forestry assets that create regional economic opportunities, while also serving multiple policy objectives in climate adaptation, biodiversity enhancement, protection of freshwater and marine ecosystems, and long-lived carbon storage.

Appendix

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27.03.2023

Ministerial Land Use Inquiry
Stefanos Destounis

Kia ora katou,

I have resided and worked as a Commercial Cray Fisher in Tokomaru Bay for the period of 45 years.
Over this period, I have spent a large part at sea, along the coast of Tokomaru Bay to east Cape.

Since Forestry arrived, I have seen huge difference in water quality along our coast from increased sediment and slash. This makes navigation dangerous, there has been a huge decline in catches in our traditional Fishing Area Cra 909. Tokomaru Bay to East Cape.
This appears to be sediment connected with the Tonkin and Taylor reports on increased sediment in rivers since the start of logging.

I witness this daily while potting along the coast. Our Ocean water quality is now of a brown silt colour, on most days at sea. There has been a rapid decline in Lobster biomass along this stretch of Coast with a large amount of reefs appearing to be barren.

With 8 miles either side of the Waiapu River mouth, these areas have produced consistent catches for 40 years. I have fished them, but now it is uneconomical to fish. This has now turned into a Environmental and ecological disaster Zone in our waterways and Coastal environment.

This needs urgent science based response, so we all understand what changes are required to Forestry poor management structure.
My concerns are with Chemical use in foresty and the lack of record keeping by Gisborne District Council to what is being applied to land, so we know what to test for, also the Acidity levels of our Coastal Environment caused by soil. Pine nettles and bark of exotic trees.
Something has drastically changed our coastal environment in which we work.

So on advice, I am told a good start would be recent known changes, hundreds of tonnes of pine nettles, now on our ocean floor, and forestry chemicals will be a good start.

Questions I would like to have addressed.

- Forestry Company Practices.
- Forestry Company chemicals used, with no register required by GDC.
- Who is going to pick up the bill for Scientific evidence to establish those at fault
- Are the owners of these overseas companies liable ???
- What is going to happen to our Rock Lobster Fishery. ????

Included in this is also the Mental and physical impact this is taking on our people.

I was for 5 weeks a member of our CDEM Akau Warriors Team. On a daily basis it was apparent That there were a number of people with stress related issues. What can you do ?? nothing as At one stage it felt we were forgotten about. I congratulate our whanau here on the ground, who Every day put their hand up to help, without considering the impact this had on them personally.

Without our CDEM Warriors here in Tokomaru Bay, we would be six weeks behind in progress, as Decisions were made by our Team Leaders who had lost contact with Gisborne CDEM, with dronage Capability, volunteers who had machines and constant team manakiitanga.
This included getting our Nurses who worked at Te Puia Springs Hauora, who had to get to mahi, this was done in particular to one individual, who enabled a track on his farm, to get these said workers to their mahi in side by sides.

Stefanos Destounis

MINISTERIAL INQUIRY LAND USE

Contact details for this submission are:

Submitter: Tomorrow's Forests Ltd (TFL)

Address: 100 Strachan Road, RD 1 Motueka, Nelson 7196

Submitted by: Roger May NZCF

Contact: roger@tomorrowsforests.co.nz

Phone: 0274 893 043

PRINCIPAL SUBMITTER

- For over 30 years TFL has provided professional forestry expertise in a range of areas including alternative exotic species plantation management, sustainable native forest management and native forest restoration. TFL uses advanced GIS systems.
- Over this time, TFL has carried out work for MAF, MPI, Ngai Tahu, Wellington City, Tasman District and Selwyn District Councils, Meridian Energy, SCION, University of Canterbury School of Forestry, NZ Farm Forestry Association, and over 100 private and corporate clients.
- Prior to retiring, the Managing Director of TFL, Roger May, was a member of the NZ Farm Forestry Association for over 30 years and a member of the NZ Institute of Forestry and the international Forest Stewardship Council.
- More recently Roger was a co-author of a paper published in the New Zealand Journal of Forestry Science. Griffiths, J. W., Lukens, C. E., May, R. K. (2020). Increased forest cover and limits on clear-felling could substantially reduce landslide occurrence in Tasman, New Zealand. New Zealand Journal of Forestry Science. Increased forest cover and limits on clear-felling could substantially reduce landslide occurrence in Tasman, New Zealand. | New Zealand Journal of Forestry Science (nzjforestryscience.nz)

SUBMISSION TO MINISTERIAL INQUIRY
LAND USE

Overview

The rules (and any risk assessment) controlling the planting of industrial Radiata plantations have been close to non-existent for many decades. Central government policy has held Radiata as the species of choice for decades. This was the case for the old NZ Forest Service (NZFS), the planting of Radiata after cyclone Bola, the Forestry Grants Scheme, and even the 1 Billion Trees programme. Over the decades, many regions had industrial Radiata plantations established on steep and fragile terrain both with and without government support. The problem in Te Tairawhiti was made worse when those government-supported 'protection forests' were privatized after the disestablishment of the NZFS thus dissolving their protection status.

While these plantations have held the soil together and reduced the risk of erosion and landslides while standing (compared to pasture), the industry's persistence in using clear-cutting as the only viable harvest system, particularly on steep and/or fragile land, has been a large part of the problem.

Large and extreme rainfall events were not uncommon in the past but now with climate change, the increasing frequency and intensity of these events is creating havoc, particularly after extensive clearcutting and for 5 to 8 years after that (the so-called 'window of vulnerability').

Geographical Scope

While it is understood that the primary focus of this inquiry is on Gisborne and Wairoa, the Panel must acknowledge that these problems have been and are occurring in a number of other regions around the country. In particular, the Separation Point Granites in Tasman, the Marlborough Sounds, Nelson and in parts of Northland, Taranaki, Whanganui-Manawatu, and the Coromandel.

Accordingly, while issues raised in this submission apply to Tairāwhiti/Gisborne District and Wairoa District, the Panel is requested to consider the same issues arising in other parts of New Zealand, in particular with reference to instruments under the Resource Management Act 1991 (RMA) as referred to in the Panel's Terms of Reference.

WHY HAS THIS HAPPENED?

The impacts in many regions of New Zealand, including the Gisborne/Wairoa districts, following multiple storm events represent a historically systemic problem of land mismanagement in this country. Nevertheless, the opportunity exists now to improve what is within control of all relevant agents of change in this sector.

The Reasons that are within Our Control

1. Lack of industry and government research into alternative species and harvesting systems.
2. Completely inadequate risk assessment process and tools.
3. Planting (and replanting) timber species with low root strength and relatively low value on steep and/or fragile terrain.
4. Total reliance on clear-cutting as a harvest system in order to maximize profits.
5. Flawed regulations (NES-PF) with their development overseen by the wrong government department.
6. Inappropriate consent conditions set by Councils.
7. Lax consent and permitted activity compliance monitoring and enforcement.
8. The industry's habit of externalizing the costs of repairing property damage and ignoring the environmental impacts.

The Impacts

The impacts are not limited to slash being mobilized off hillsides into waterways, on to land downstream and into the marine environment in large or extreme weather events. Sediment is even more pervasive. The amount of sediment entering waterways, inundating land and damaging estuaries and the marine environment will be greater than that of the slash in any given event. This is less visible and rarely quantified. While mobilised slash may result in damage to farms, houses, and infrastructure, sediment is ubiquitous downstream, even in moderate rainfall events. The Panel needs to acknowledge that the scope of the problem goes far beyond the damage caused to the built environment. Freshwater and the marine environment are also significantly impacted.

Also see A CLOSE SHAVE [Documentary] - YouTube – a 20 minute video taken in Marahau, Tasman during and after the ex-cyclone Gita event.

Development of the National Environmental Standard for Plantation Forestry (NES-PF)

For years, the forest industry had pushed for a NES-PF. In 2010 the Ministry for the Environment (MfE) began a public consultation process on the matter. By 2015 this process had been transferred to the Ministry for Primary Industries (MPI) with no public explanation as to the reason. MPI established a National Standard Working Group which was tasked with developing the standard under the RMA. The group was dominated by corporate forestry representatives and MPI bureaucrats. It was wrong that the Ministry overseeing primary production was the lead agency instead of the department responsible for the environment and the RMA (MfE). This would more likely to have led to a more balanced Working Group and produced an NES with more effective controls. The NES-PF was formally introduced on 1st May 2018, presumably with the assent of the Minister for the Environment.

The Erosion Susceptibility Classification (ESC)

The ESC is a critical map-based tool within the NES-PF that controls plantation forestry operations and whether a consent is required, particularly for earthworks and harvesting. The ESC is based on the NZ Land Resource Inventory and uses a 'traffic light' system of Green, Yellow, Orange and Red.

The ESC does not have enough resolution or sufficient accuracy to work as a reliable measure of erosion risk. It is now widely acknowledged that the ESC is not fit for purpose, even by MPI and the members of the (Manaaki Whenua Landcare Research) team that produced the final version. Some experts are now referring to it as a simple 'drafting gate'. The Panel should be calling for a complete overhaul of how forestry risk assessment is performed.

The NES-PF Regulations

Along with the ESC, the regulatory framework is also defective. In general it is too permissive. A glaring omission in the regulations is that there are no effective limits on the size of plantation clearcuts or controls on the aggregation of clearcuts in any zone other than Red. This is completely unacceptable and needs serious consideration by the Panel.

The impact of this is that the cost of remediation of damage arising from clearcuts on steep and/or fragile terrain is externalized, i.e. it does not appear in the costs and revenues of a forest harvesting operation. There are numerous cases where the ratepayers and/or taxpayers have effectively paid an amount close to or greater than the profit from a harvesting operation.

Another issue with the regulations is the conditions associated with permitted activities. For example Regulations 26(a) (earthworks), 65(a) (harvesting), 74(6)(a) (mechanical land prep), and 90(a) (slash traps) all state that; after 'reasonable mixing' there shall be no 'conspicuous' change in colour or visual clarity of the receiving waters. However, there is no definition in the regulations of what constitutes 'conspicuous' or 'reasonable mixing'. Because these terms are so subjective, there are no specific thresholds that will facilitate compliance and enforcement.

Yet another example is that Under Regulation 66, a Harvest Plan is required for all erosion susceptibility classification zones and for Red or Orange zones, an Earthworks Plan must be prepared. Under Regulation 66 (4), these plans must be provided to the relevant council on written request. However, it is not possible under the regulations for a Council to reject or request any changes to such plans. This is illogical and needs to change.

Council Rules

In most cases, Councils are restricted to the NES-PF regulations unless they are able to impose more stringent controls under Regulation 6. But the scope for more stringent controls is very restricted. However, Regulation 6 (1) states that "A rule in a plan may be more stringent than these regulations if the rule gives effect to—

(a) a freshwater objective developed to give effect to the National Policy Statement for Freshwater Management.

It is unknown how many Councils have utilized this provision to increase the stringency of their rules (rather than relying on a 'conspicuous change in colour or visual clarity after reasonable mixing').

In Tasman, the Tasman District Council (TDC) has yet to apply greater stringency to rules in the Regional Plan despite the fact that Regulation 6 (3) (a) allows greater stringency to be applied to the Separation Point Granites in Tasman (which have substantial areas of Radiata plantation). TDC have delayed taking action on this for almost 5 years now.

The Panel needs to consider how Councils are called to account for delaying the introduction of effective rules and for approving defective consents.

Compliance Monitoring and Enforcement

Compliance monitoring and enforcement is another reason why these damaging events continue to occur. For example, the Compliance Manager at Tasman District Council was asked, after ex-cyclone Gita and all the damage caused by clear-cutting, whether the TDC monitored Permitted Activities. The clear answer was 'No, not unless there is a complaint from the public'. Asked if any Enforcement Orders or Abatement Notices had been issued after Gita, the answer was again 'No'.

This raises again the question of how Councils are to be encouraged, if not legally forced, to carry out their responsibilities under the RMA (or the replacement legislation) particularly since the Regulations provide for Councils to charge forest managers for such monitoring.

WHAT NEEDS TO CHANGE?

The Solutions

1. Urgently increase funding for research into alternative exotic timber species, particularly those that are of higher value, possess higher root strength (more stable), or retain live root systems.

2. Urgently increase funding for research into alternative harvest systems (shelterwood & continuous canopy) that reduce the risk of erosion, landslides and sedimentation.

3. Urgently increase funding for research into the viability of more appropriate harvesting (felling and extraction) equipment that reduces ground disturbance and sedimentation.

4. Develop a comprehensive Standard (structure, format and process) for full cycle forestry risk assessment.

5. Develop an industry tool that allows forest managers to match management options with the assessed risk.

6. Amend the NES-PF Regulations to include limits on clearcut size and aggregation.

7. Amend the Regulations to specify realistic limits (by location or susceptibility) for none-point sediment discharge, particularly suspended sediment.

8. Amend the Regulations to set specific limits on the size of slash and debris that may be left on the cutover.

9. Amend the Regulations to allow Councils to require amendments to or rejection of Harvest and Earthworks Plans.

10. Introduce government-imposed penalties for Councils that fail to implement changes to their resource management plans within specific timeframes and that fail to set and implement effective policies, procedures and systems for compliance, enforcement and record-keeping.

11. Amend the RMA and/or the NES-PF Regulations to provide for bonds for Permitted Activities that are subject to conditions.

There are many changes and improvements that need to be considered by the Panel to bring Forestry NZ into the 21st century. The forest industry has been very successful in introducing more mechanization into harvesting operations both for increased efficiency and to better protect workers. The industry spends millions each year on research into this and on gaining other efficiencies.

And yet there is obvious resistance in the industry to investing in alternative systems, methods and equipment and setting standards that are properly designed to avoid, remedy and mitigate adverse effects. In essence, the current mitigation measures are not matched to the risks and few, if any, in the industry have acceptable remediation policies.

Because the industry does not have to cover the full cost of remedying any property or environmental damage and because the court fines are comparatively minor, there is at present little incentive for the industry to invest in proper risk assessments, alternative species and low-impact systems. Currently, their only motivation is to retain their social license.

Improving Risk Assessments

Forest managers, particularly harvest planners, need to better understand the risk assessment process. Risk assessment should include a description of the risk, the probability/likelihood of the event, the potential consequences, the mitigation measures, and the residual impact. All reasonable risks must be included. Furthermore, harvest planners need to utilise metrics such as slope stability analysis[1] and the Melton Ratio[2] analysis as a part of their risk assessment process.

Matching Operations to the Risks

Having completed a comprehensive risk assessment, the manager/planner then needs to choose the systems, methods, equipment and skill sets that will match those risks. To this end they need to be able to refer to a larger palette of species and management options than used at present. The options currently used are monocultural, single-aged Radiata, harvested using clearcut systems and replanted in Radiata. This is a simple formula but in steep and/or fragile terrain, a recipe for disaster.

[1] Eg. SINMAP Slope Stability software. See Sinmap 2.0 For ArcGIS 9.x (usu.edu)
[2] See MLDC158 (envirolink.govt nz)

There is a need for dedicated research into the breeding and performance of more valuable alternative species, alternative silvicultural and harvest systems and low impact felling and extraction equipment. There is also a need for more comprehensive research into the best methods for transitioning Radiata to indigenous forest where the risk of adverse effects is too high to justify continuing commercial productivity.

Species choice for replanting after Radiata or for afforestation is a major factor that can reduce the risk of adverse effects of harvesting. Many exotic species, both hardwoods and softwoods, have stronger root systems than Radiata and some retain live root systems after harvesting thus reducing slope failure. Commercially, many of these alternative species are more valuable timbers which means that they can stand the extra cost of using low-impact harvesting systems. The lack of species diversity in our forest industry is a major concern that requires addressing.

Landscape and Catchment Planning

The most logical approach to forest management planning is (a) at the landscape scale and (b) at the catchment scale. Broader environmental and social impacts can be assessed at the landscape scale and should precede catchment planning (and initial afforestation).

More detailed operational planning should then be done at the catchment scale taking account of catchment order. To explain - the first formation of a stream in the headwaters is a first order stream. Under the Strahler system, immediately below the confluence of two first order tributaries, the stream becomes a second order stream and so on down to the sea. The catchment orders reflect these stream orders. Catchment order is therefore a natural hierarchical framework for designing planting, earthworks and harvesting operations so as to avoid adverse impacts. All earthworks and harvesting planning, irrespective of the scale of operations, should be based on the catchment size and catchment order.

Use of Low-impact Harvesting systems

Low-impact harvesting systems have been used in Europe and parts of North America for decades. These have been used on steep and/or fragile terrain and in many jurisdictions, are required to be used by law. These systems are rarely used in New Zealand plantations but under Part III A of the Forests Act 1993, are required to be used in the management of privately owned indigenous forest.

Imposing Limits on Clear-cutting

It is patently clear that the size of clearcuts used in our plantations on fragile land is too large and that this results in accelerated run-off, greater concentration of overland flow, flooding, debris floods and debris flows[3]. The logical way of reducing these effects is to limit the spatial and temporal distribution of the clearcuts on steep/fragile terrain in accordance with the identified risks. This means that systems such as patch felling (shelterwood) or continuous canopy systems need to be used.

[3] In general, flooding is water, a debris flood is water and soil, and a debris flow is water, soil, rock, slash and logs.

It is acknowledged that there is a possibility of windthrow with these systems, particularly if the crop is a single species, single age plantation and felled using methods other than extensive clear-cutting. Opening gaps in such a plantation is likely to increase susceptibility to windthrow. However, the possibility of windthrow cannot be used by a forest owner as a justification for extensive clear-cutting. Windthrow is a problem for the forest owner and it is unacceptable that the risks be transferred to the public and the environment.

Use of Low-impact Felling Equipment

It is now common for steepland harvesting in New Zealand to use tethered felling machines. These are large (30 – 40 tonne) tracked machines with a harvesting head and a heavy wire rope anchored at the top of a slope to aid access and maneuvering. Being tracked, they create a significant amount of ground disturbance. In Europe, such slopes are often harvested using articulated wheeled machines that may also be tethered but have more maneuverability and create less ground disturbance. Upper crown and small branch-wood is all that's left on the cutover.

See *Highlander in Action* • HL20-1 - 6 Rad • Steilhang-Harvester • Konrad-Forsttechnik • Part-1 - YouTube and

KONRAD HIGHLANDER, Einsatz im Steilhang - YouTube and

Holzernte im Steilhang mit Traktionswinde Herzog Synchrowinch und Harvester Ponsse Scorpion Giant - YouTube

There are at least two of this type of machine in New Zealand but we need more.

Use of Low-impact Extraction Equipment

Most plantation timber on steepland in New Zealand is extracted using haulers or swing-yarders. These are large machines set up on mid-slope or ridge-top skids with cables running down to a movable anchor at the bottom. Logs are invariably extracted with at least part of the log dragging on the ground. Therefore it is more common for extraction to be uphill in order reduce the convergence of run-off during rainfall events. On smaller areas of steep land ground-based extraction by wheeled or tracked skidders are often used where the costs of hauler extraction is prohibitive. All these types of extraction equipment generally increase the ground disturbance first created by the felling process.

The low-impact alternative is full-suspension extraction which removes the risk of further ground disturbance. Full-suspension systems are commonly used in steep terrain to reduce these impacts and often, to reduce the need for roading. They may be truck-based or self-propelled winches.

It is rare in New Zealand for full-suspension cable systems to be used although in Europe, full suspension is often required by law on steep/fragile terrain. At present, there are at least two of these machines in New Zealand but there needs to be more.

See Carriage Slackpuller • Wyssen Seilbahnen AG Click then scroll down to videos.

Imposing Limits on Hillside Slash

Felling operations often result in broken stems which are usually left on the cutover. Defective stems and branches may also be left. While there may be markets for this slash, the extraction and transport of this is usually more costly than the market is prepared to pay so it is either piled up on or around the edge of the skids or left on the slope. However, it is useful to leave lighter branch wood and foliage on the slope in order to protect the soil and for nutrient cycling.

It is therefore necessary to set limits on the size of wood that may be left on the hillside in order to reduce the impact down-slope if it is mobilized during a rainfall event. These limits need to be incorporated into the regulations.

Replanting

It is the planting of relatively low value timber species on steep and/or fragile land that incentivizes clearcut harvesting (so as to maximize returns) which then increases the risk of adverse effects. Replanting of such tree species on cutover land with this level of risk should be prohibited.

Instead, the first step should be to carry out a risk assessment using the most suitable exotic species and low-impact harvesting. If the risks are still too high then expectations of commercial productivity must be abandoned. In this case, the cutover (or standing plantation) should be managed back to indigenous forest. It should be noted that this transition back to native forest could still utilize suitable, faster growing, wide-spaced exotics in order to stabilise the slopes and provide cover for the slower growing native species. Of course this affects the forest owner's investment but if their cost/benefit analysis or due diligence processes were flawed prior to planting or purchase, then that is their problem. The potential risks of planting, clear-cutting and replanting Radiata on steep and/or fragile terrain should not be transferred to the public or the environment.

Compliance Monitoring

In general, Councils have a poor track record of monitoring compliance of activities permitted under the NES-PF despite the fact that the regulations allow Councils to charge operators for such monitoring. The Panel should consider ways to encourage or legally require Councils to carry out monitoring of permitted activities and for setting the criteria and standard for monitoring and reporting.

Under the RMA (and presumably the successor legislation) Councils are responsible for monitoring consents. When issuing a consent, Councils have the authority to require a bond under RMA Section 108A. However, it is understood that no such provision applies for Permitted activities even when conditions apply. Either the RMA or the NES-PF should be amended to provide for the payment of bonds at the time that Earthworks and Harvesting Plans are lodged (assuming that the regulations are amended to require such Plans to be lodged). It is suggested that the bond amount be set by independent risk assessors in consultation with each Council. This would incentivize operators to seriously attempt avoid adverse effects provided the bonds were sufficient to cover all remedial action.

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Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

6 April 2023

Ministerial Inquiry into Land Use
Ministry for the Environment
Wellington

Attention: Ministerial Inquiry into Land Use Panel

By Email:

Gisborne District Council's submission into land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in Tairāwhiti/Gisborne District

1. We thank the Inquiry Panel for the opportunity to provide a uniquely Tairāwhiti perspective on the woody debris and sediment issue. The main points of this submission were also presented by Gisborne District Council (Council) staff in person to the Inquiry Panel, on 4 April 2023, in Tairāwhiti.
2. We acknowledge Government's commitment for taking up the challenge of addressing this sensitive matter in the short time span provided.
3. For further clarification please contact Joanna.Noble@gdc.govt.nz
4. We give consent to Gisborne District Council's submission being published where applicable.

Nāku noa nā,

Nedine Thatcher-Swann
Chief Executive Officer

Joanna Noble
Chief of Strategy and Science

Contents

Ministerial inquiry into Tairāwhiti/Gisborne land-use

1. PURPOSE AND SCOPE OF THE INQUIRY

- The scope of inquiry (as set out in the Terms of Reference) is specific to land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in the Tairāwhiti/Gisborne and Wairoa Districts, and to make recommendations about the further work needed to address land use impacts of storms.
- This written submission focuses on Tairāwhiti, and the impacts created by clear-fell plantation forestry. We acknowledge that sediment discharge is also generated by other land-uses, including farming. However, the government has already introduced a suite of freshwater regulation to address farming practices that is significantly less enabling that that in place for plantation forestry. This regulation, coupled with the economic drivers for conversion of highly erodible land to forestry, means that this submission focuses on plantation forestry.

2. EXECUTIVE SUMMARY

2.1. PRIMARY SUBMISSION POINTS

2.2. Council acknowledges that urgent action is needed to ensure better outcomes for the environment and our community. We look forward to this inquiry informing change to national policies and regulations so that the national settings actively support and enable an appropriate approach to managing land use in Tairāwhiti/Gisborne.

2.3. It is easy to look back and ask why wasn't more done 25 years ago when the pine plantations were planted in the Tairāwhiti/Gisborne region to prevent the issues we are now experiencing. Today no one in the driver's seat had any involvement in the past legacy issues and are desperate to see a step change in the legislative environment to support our region. Noting that "context is everything" hindsight is a wonderful thing, but foresight is even better.

2.4. Harvest volumes have significantly increased over the last 10 years. This is coupled with a move to harvest steeper more vulnerable land and more frequent ex tropical storms and cyclones. The introduction of the NES-Plantation Forestry (NES-PF) in 2018 cut across regional powers imposing a one size fits most set of rules for the country, that set a permissive regulatory framework for clearfell plantation forestry. Attempts to impose more stringent controls have received vigorous push-back from the forestry sector.

2.5. Council agrees that a new approach to sustainable land use, inclusive of all land uses, is needed for Tairāwhiti and a lot of work is already underway as part of the Tairāwhiti Resource Management Plan review. However, the plan review process takes time, especially if not well-supported by national level policy, and there is likely to be economic and associated social impacts from introducing a more restrictive regulatory regime. Government intervention and investment to create change remains an important part of addressing the issues we face and ensuring an equitable transition.

2.6. We are also reviewing and adjusting our consenting processes, have established a forestry taskforce to address the issue of woody debris that has the potential to be mobilised within catchments, and continuing our compliance, monitoring and enforcement programme.

2.7. SUMMARY OF RECOMMENDATIONS

SOLUTIONS UNDER THE CURRENT SYSTEM	
To complement controls via the NES PF, a slash management plan (within **Forest Environment Plans**) should be required as part of the permitted activity in Green/ Yellow/Orange (most), and for a resource consent application for harvesting on Orange/Red Zone land. They could consider a wide range of options to address plantation forestry management:	Long term binding **Forestry Environment Plans** (that include slash management plans) Setbacks: inclusion of realistic case by case Biodiversity setbacks: 5 and 10 m have proven inadequate. Require direct actions within setback areas such as *high stumping* is required to harvested trees to a height of 1.0 metre

	within one tree length of the permanent 'biodiversity set-back'. Increased stringency is required for harvesting and replanting
Require a further Risk Zone for Extreme Risk, a "Purple" zone where *plantation* forestry should not take place. Some of the areas are shown in figure 6. We believe many sites should now be re-planted or aerial sown (drone) with un-palatable native species such as manuka, kanuka, tutu, rohutu which will allow recovery without negative browsing impact from ungulates	Erosion Susceptibility Classification (ESC) use at a realistic scale with further attributes considered. These in turn underpinned by rules that are more stringent than the NES-PF in the Councils emerging Land use plan (replacing the TRMP) examples at Appendix 3. Hold settings at strategic points.
Safe storage or removal (as a valuable raw material) of wood debris from landings, especially in steep slopes. Harvesting methods that minimise breakages and place potential slash in safe sites. Partial catchment (coup) harvesting[1]	Location and timing of installation of slash catchers Consideration of the potential for slash to be generated from the harvested slope (less likely on easier slopes and further from waterways). Introduction of live slash retention plantings at harvest to protect the site at the subsequent rotation harvesting. Retention of riparian vegetation.
RMA Prosecution changes **Greater cost recovery** **Higher fines** **Remove option** for offenders to elect a jury trial. **Inclusion of civil sanctions** as a tool to respond to offences when traditional prosecution is not the best tool	Enable Council to recover more from prosecutions. This would help offset high legal costs and allow remediation of impacts. Polluter or the ratepayer pays Increase maximum fines available for criminal prosecutions. **Any fines imposed should be reflective of the environmental, infrastructure and social impact of the offending.** No jury trial would reduce delays and costs associated with prosecutions
Changes to the Tairāwhiti Resource Management Plan (ideally supported by national direction)	
New overlay (riskiest land)	The *purple zone* (referred to above)

[1] Alternatives to clearfelling for harvesting of radiata pine plantations on erosion-susceptible land Mark Bloomberg, Eric Cairns, Denny Du, Harriet Palmer and Chris Perry NZ Journal of Forestry, November 2019, Vol. 64, No. 3 http://www.nzjf.org.nz/free_issues/NZJF64_3_2019/5D9ABDDD-40ED-494f-BE1F-BE5BE4AF5A64.pdf

Reduce volume of woody debris – logging residues removed; slash at landings removed	Tighter controls on harvest; drive land use change
More substantial setbacks	To provide a natural buffer between harvest areas and waterways
Area based restrictions on harvest in catchments/sub catchments	Reduce the amount of land that is vulnerable until a vegetation has re-established
Carbon and Conservation Forests	Content to expand aspects from the NESPF to all Forests
Manufacturing Clusters to stimulate demand for Biomass	Provisions to enable development of manufacturing clusters. As the new RMA system that will provide RSS is not in place for a number of years.
POST RMA IMPROVEMENTS UNDER THE NBA, RSS and NPF	
RSS **Manufacturing Clusters** to stimulate demand for Biomass	Details in section below.
Limitations of the NES-PF to provide content into plans will be provided for by the NPF.	Greater ability to incorporate into plans, see below.
Incorporation of the Forestry Owners Association *Voluntary* **Code of Practice** into the system.	Details in section below.
New approaches to land-use could be explored through the development of the Regional Spatial Strategy (RSS) which will be required by the new Spatial Planning Bill currently being considered by Select Committee. However, this is not an immediate solution.	Central government buy-in and investment will be critical to achieving transformational change.
Creation and implementation of biodiversity credits	A system is needed to incentivise transition to a more sustainable land use on the most vulnerable land that also provide multiple positive outcomes
ROADING	
Review of **Waka Kotahi's Emergency Work Policy**	Policy is capped at an organisation's normal FAR plus 20% to a maximum of 95%.

Collaborate with other councils impacted by weather events like Wairoa and Tasman likely similar issues.	Bespoke application for 100% is already predetermined.
TECHNOLOGY	
Greater use of technology such as drones and tagging.	Could be set out in RMA or the Forests Act. Details in section below.

3. TAIRĀWHITI/GISBORNE REGIONAL CONTEXT

3.1. Gisborne District Council (Council) was created in 1989 as the first of six unitary authorities with both regional council and territorial authority functions and responsibilities. Our status comes from the district's relative isolation and its strong communities of interest. We combine the functions, duties and powers of a territorial authority (service delivery bodies) with those of a regional council (regulatory authorities).

3.2. Tairāwhiti covers a land area of 8,265 square kilometres. While we are home to only 1% of the national population, our land area comprises 3% of New Zealand's national land area. Tairāwhiti is 8% of the North Island but has 25% of the severe to extreme soil erosion.

3.3. Māori comprise more than half the population of our region. Government has and continues to make decisions that place Māori (whanau, hapū, iwi) at a considerable economic disadvantage and is evidenced by the Tairāwhiti featuring regularly as one of the most socially and economically deprived regions in the country.

3.4. Here in Te Tairāwhiti iwi, hapū, and whanau have lost most of their best lands that have the most productive soils. There is 228,000 ha of whenua Māori in Tairāwhiti, and it is predominantly LUC 7 to 8, and situated more than 80 km from the Gisborne Port.

3.5. Māori have invested heavily in forestry. Capital investment in forestry on Māori farms/lands in Tairāwhiti increased by about 46% as at 2018 (MfE & Stats NZ, 2018). A significant proportion of this land is located on the East Coast. Without support to make other forest types financially viable, permanent exotic forests in remote areas where harvest is not economically or environmentally feasible are a means to provide income from whenua Māori.

3.6. In Tairāwhiti, whenua Māori has significantly more indigenous cover than General Title land. However, Māori were not granted Carbon Credits for their pre-1990 indigenous forests.

3.7. In 2020, Council adopted the Tairāwhiti 2050 Regional Spatial Plan, which sets out a collective vision for the region for the next 30 years. The following aspirations are relevant to this kaupapa:

- Land uses across the region are optimised to suit their physical and cultural setting and have adapted to changing climate patterns.
- No "at risk" catchments in the region.

- There is a korowai of more permanent vegetation on highly erodible and most vulnerable steep land.
- The mana of the whenua and mauri of the waterways is restored in Te Tairāwhiti.
- We can swim in our waterways and our beaches and waterways are free of forestry slash.

3.8. Population growth in Tairāwhiti over the past three years has increased at a higher rate than expected. The region's population is now over 50,000 and continues to grow. This growth is putting pressure on services, housing, infrastructure, and the natural environment. We also have a younger population than most other regions, and the over 65 age group is growing. These factors influence the ability of our community to pay more rates and our ability to match the level of investment other councils can make in capital projects and operational programmes.

3.9. In the year ended March 2022, forestry was one of the biggest contributors to Tairāwhiti region's GDP, alongside agriculture; health & social services; and hiring, rental and real estate services[2].

Table 1: Most significant contributions to regional GDP by industry sector (data is for the year to end March 2022)

Industry	Gross Domestic Product ($million)	Percentage of total regional GDP
Agriculture	222	9%
Health care and social assistance	220	9%
Forestry, fishing, and mining	219	8.9%
Rental, hiring, and real estate services	207	8.4%
Owner-occupied property operation	185	7.5%

[2] Figures extracted from Stats NZ Regional GDP Regional gross domestic product: Year ended March 2022 | Stats NZ

4. THE REGION AND FORESTRY

4.1. Severe erosion issues have been longstanding in Tairāwhiti with soil conservation programmes operating since at least the 1950s.

4.2. As a means of reducing both the on- and off-site impacts of erosion, particularly within and downstream of areas of 35,000 ha of severely eroding pastoral hill country was progressively retired and planted (1962–1985) in exotic forest species as "protection forests"[3].

4.3. The first major forestry plantings were undertaken in the Mangatu Forest in the 1960s, and significant afforestation has happened in a range of areas across Tairāwhiti since that time. About 17% of Tairāwhiti's landmass has now been converted to forestry.

4.4. In 1988 Cyclone Bola caused further significant soil erosion and landslide related damage within existing areas of planted exotic forest and across extensive areas of remaining pastoral hill country. More detailed information on Cyclone Bola and the subsequent Inquiry is provided in the further information links at the end of this document.

4.5. Following Cyclone Bola, the East Coast Forestry Project (ECFP4) was set up in 1992. This project subsidised large-scale planting of Pinus radiata across the district, often on the most seriously eroding land. The focus moved to blanket Pine Radiata establishment with little consideration of establishing long term species, such as willows, into gullies.

4.6. On-farm soil conservation works, which had traditionally introduced trees into gullies and eroding slopes, were not continued at this time. Some were planted under subsidy with the intention of both recovery and establishing a commercial forestry industry including some land cleared from regenerating indigenous scrub at the time of Cyclone Bola. Land planted by the New Zealand Forest Service as "protection forestry" with the main objective to combat very serious accelerated soil erosion with production of timber as a secondary aim.

4.7. Following several reviews,[5] the project was extended from commercial afforestation to also include reversion grants (assisted natural regeneration of forest) starting in 2000 and require a non-use covenant with a 30-year term to be registered. A requirement for all grantees to register 50-year covenants on their land titles was introduced in 2007.

4.8. *Pinus radiata* remains the preferred tree species for plantation forestry operators and for carbon forestry due to its rate of sequestration, through increasing economic potential, the earliest of the "protection forests" were later reclassified as "protection-production forests", raising concerns at the time over the probability that their harvesting would reactivate erosion.

4.9. Many of the forests planted post-Bola are now being harvested. Harvesting accelerated around 2010, and since that time the region has also been subject to greater and more frequent severe weather events – which have combined with forestry harvest to result in unacceptable environmental and community effects. Coupled with this, in 2018 the introduction of the NES-Plantation Forestry removed regional controls over forestry harvest. Until 2018, all forestry in Gisborne required a resource consent. From May 2018 (when the NES-Plantation Forestry was introduced) only forestry on the most severely eroding land (Erosion Susceptibility Classification Very High/ Red) required consent for harvest.

4.10. The plantation resource is about 155,359 hectares (ha), consisting primarily of Pinus radiata (150, 806 ha) and Douglas-fir (2,090 ha of Douglas-fir) much of it on steep and severely eroding land. The forestry estate in the region has the potential to generate a substantial increase in the amount of wood available over the next three to four years, coming mostly from the small-scale[6] owner resource. This volume reduces substantially as the large plantings from the 1992 to 1995 period are harvested[7].

4.11. Initial harvesting was on highly erosion prone, but generally easier sloping areas. Harvesting moved from easy sloping but eroding land to steep slopes with shallow and skeletal low fertility soils. As the first rotation harvests on steep lands have proceeded, the issue of sediment and woody debris deposition into waterways, onto floodplains and beaches and ultimately the coastal environment have become of increasing concern.

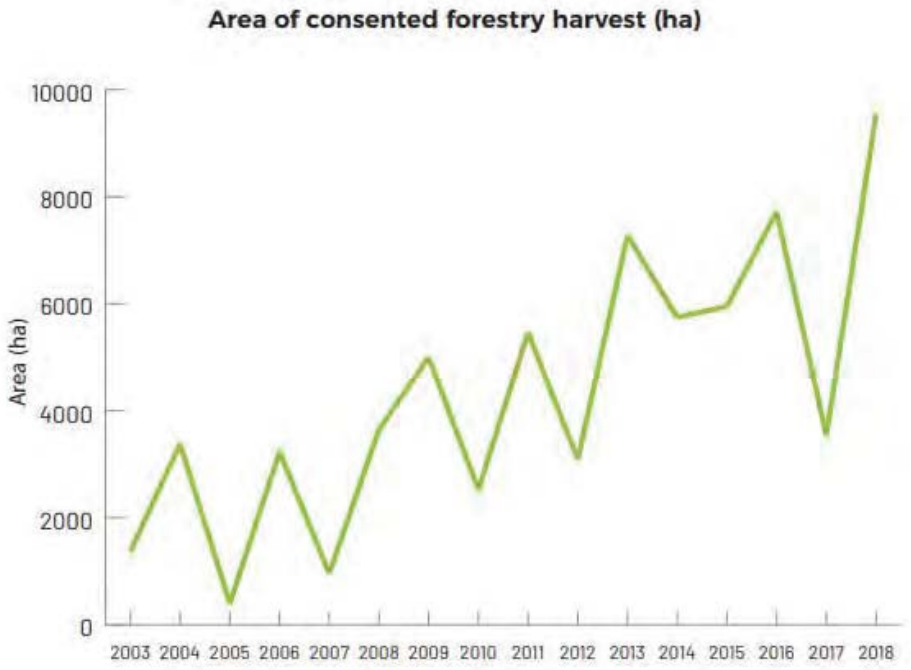

Figure 1 Forestry harvest by year. Forestry harvest planning tends to be on a two-year cycle, with a busy year followed by a less busy year. This trend can be generally observed since 2003, with a step change increase in harvest areas from 2009.

[3] Poole, A.L. (1960). Protection forests in New Zealand and a Poverty Bay example. New *Zealand Geographer*, *16*(2), 115-130. https://doi.org/10.1111/j.1745-7939.1960.tb00309.x

[4] Programme is closed but funds approved up until 2018 are still available to landowners. Alternative treatments can be progressed, but the funding is capped to the approved sum.

[5] MPI 2005 review of the ECFP https://mpi.govt.nz/dmsdocument/3999-east-coast-forestry-project-review

[6] Small-scale owners have less than 3 000 ha of forest in the region

[7] Ministry for Primary Industries Wood Availability Forecast - East Coast (mpi.govt.nz)

5. APPROACHES TO HARVESTING IN TAIRĀWHITI

5.1. Commercial exotic planation forestry is clear felled, removing all trees from large areas at any one time. This applies both on the easy sloping and steep terrain. Timber removal methods vary, generally according to terrain.

5.2. Ground-based machinery (such as tractors or skidders) are used on easier slopes, whereas cable-hauler or skylines are used for steep terrain. Removal by helicopter is possible but rarely used due to cost[8]. Drone technology is being used and emerging as an option for harvest and thinning but is not being used in Tairāwhiti.

5.3. Ground based harvesting can substantially degrade and scar the land over which the trees are towed, leaving it vulnerable and exposed to erosion. Weight distribution of ground-based machinery based improved significantly resulting in reduced disturbance over time. Tracking of ground-based access tracks needs to have cutoffs to prevent water concentration installed at the completion of harvesting. Woodlots require remedial earthworks and water controls to be left in a functional condition on completion of harvesting activities as machinery is removed from the site on completion of harvesting.

Figure 2 Areas prone to gully formation from tractor logging

5.4. The heavy machinery and logs hauled over the surface also contribute to soil compaction, contributing to water-logging if satisfactory drainage is not provided and maintained.

5.5. Cable logging can also leave deep, erosion-prone scarring on outcrops of steep land and near to landings on concave upper slopes, Logging roads need to be well constructed with robust a water-table, culverts and water controls installed. Mechanical harvesting has significantly reduced breakages resulting in increased retrieval of logs to landings as well as improved placement of logs as they are felled. This provides improved returns and environmental effects.

[8] Taranaki Regional Council. (n.d.). *Harvesting a radiata pine woodlot*. Retrieved May 27, 2008 from http://www.trc.govt.nz/environment/land/pdfs/44_harvestinga_radiata_woodlot.pdf

Figure 3 Gully erosion

Figure 4 Soil compaction from skidder logging

Figure 5 Steep land left denuded and vulnerable from cable logging

5.6. **Issue 1: Exacerbation of Risk of Landslip and Debris Flow from Forestry Activities on Vulnerable Land**

5.7. Some of the land with the greatest erosion risk has been planted in plantation forestry.

5.8. There are no effective mitigation options where the riskiest land is subject to clearfell plantation forestry. The land slide risk which is prevalent under pastoral farmland is also substantial for at least eight years (30%) of the plantation forestry cycle and in some locations, when forestry thinning or significant disturbance to the canopy is undertaken, extending to 50% or more of the plantation forestry cycle.

5.9. When landslip occurs in forestry situations, this exacerbates to debris flow as slash, woody debris, windthrow and riparian vegetation are all entrained in a destructive flow that can have substantial environmental, social and economic impacts on downstream areas.

5.10. **Issue 2: The High Volume and Concentration of Forestry Waste Creates a High Risk of Mobilisation of Forestry Slash across Tairāwhiti**

5.11. New Zealand forests generally have a high proportion of forestry waste compared with other countries in the OECD (Visser et al 2017), with an average 15% left on the slopes and by landings after harvest. This makes safe disposal of forestry slash more difficult and when it is mobilised, there are very substantial volumes involved.

5.12. This is exacerbated because most Tairāwhiti land where forestry is established is in the steeper areas. The overwhelming majority of forestry in Tairāwhiti is harvested using cable hauling operations. The size of landings (where wood is haul to, processed and trucked out) are also very large by international standards.[9] Large landings mean large concentrations of wood waste and wood from landings has been implicated in many landslide and debris flow events, particularly those which occurred during the 2018 storms[10].

5.13. In order to reduce the risk of landing failing, forestry companies are now commonly pulling some unstable material up onto the landing at the end of harvest. However, in a very large storm event, these areas can still fail – with the heavy weight of wood contributing to debris flow.

5.14. Large landings also lead to more extensive earthworks – such as larger roads (as more trucks will need to visit the landing to collect the wood). The more extensive the earthworks in steeper lands, the more likely to trigger erosion and landslides, so these are all connected matters.

5.15. Forestry slash production is known to be substantially exacerbated by some other cable hauling practices – the most significant of which is hauling logs over gullies and streams. Research by Scion[11] indicates that hauling across streams, generates 2 – 4 times the amount of woody debris than hauling the wood away from streams. This is because when hauled across streams the riparian areas are usually substantially damaged by the logs, and in some cases the logs are dragged through the waterbody destroying the integrity of the banks of the waterway. While an attempt to address this issue was made in the TRMP, with a restricted discretionary activity rule in place for hauling through riparian areas, in practice these consents are routinely granted, and the existence of the rule has not resulted in significant changes in forestry practice.

5.16. Most harvest in Tairāwhiti operates under Permitted or Controlled Activity in the Red ESC areas, so there is no direct incentive or requirement for forestry companies or contractors to reduce the volumes of slash and woody debris left in a forest during forestry harvest.

5.17. **Issue 3: Management of Offsite Impacts of Forestry Slash including from Legacy Harvest Operations**

5.18. With the frequency of mobilisation of forestry slash, and large volumes now deposited in streams and in the coastal environment there is a substantial legacy issue to be dealt with. No firm estimates of volume of existing slash exist, but in some locations (such as Mangatokerau Catchment, Waimatā Catchment) the estimates of residual material are in the hundreds of thousands of tonnes. When it is considered that in recent years 2.8 million tonnes/year has been exported from Gisborne Port, where 15% on average is residual waste left on slopes – alongside further material left at landings, it could be expected that in the order of 500,000 tonnes per year of material is being left in harvested forests.

5.19. Over the last eight years of harvest (from which most of the woody debris has come) this could mean in the order of 4 million tonnes of woody debris was deposited in forests. While each year thousands – or sometimes tens of thousands of tonnes of woody debris is mobilised and deposited in streams, on private land and on beaches, there is a very substantial volume of material that still remains yet to be mobilised, or is trapped in birds nests (huge wood dams in steep gullies), and gradually moving downstream in each storm.

6. WOODY DEBRIS AND SEDIMENT IMPACTS

6.1. Historically, mobilisation of woody debris and forestry slash was a periodic occurrence in Tairāwhiti (such as 1994 Wharerata storm event). However, since 2010 there have been landslips and woody debris mobilisations in some locations in the district at least annually (see Appendix 1).

6.2. The adverse environmental and social effects of clearfell forestry harvesting are increasingly prominent in the district. Additional information and photographs events are presented in Appendix 1 and 2.

6.3. We believe that the increase in woody debris incidents is for several reasons:

- The steeper more slip prone land is being harvested
- Harvest practices adopted are not suitable for the terrain (despite the assurances and statements to the contrary made by forestry companies in their consent documentation)

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[9] Visser, R., Spinelli, R. and Brown, K. (2018) Best practices for reducing harvest residues and mitigating mobilisation of harvest residues in steepland plantation forests. Canterbury School of Forestry, Envirolink Report 1879-GSD152 for Gisborne District Council

[10] Cave, M., Davies, N. and Langford, J. (2017) Cyclone Cook Slash Investigation. Report for Gisborne District Council, October 2017. Cave, M. (2019) Forestry Harvest Residues on slopes in Makiri Forest Upper Waipaoa Catchment Storm of 11th-12th June 2018. Report for Gisborne District Council. Cave, M. (2020) Tikapa Beach Woody Material July 2020 storm. Report for Gisborne District Council. 22 September 2020. Cave, M. (2021) Post Storm Surge May 2021 Clean-up of North Tolaga Beach. Report for Gisborne District Council June 2021. Cave, M. (2022a) Downstream impacts of sediment and woody debris inundation in the Mangaheia sub-catchment Uawa Catchment during the Queens Birthday Storm 2018. Report for Gisborne District Council. September 2022 Cave, M. (2022b) Estimates of log volumes on Tolaga, Kaiaua and Anaura Beaches. Report for Gisborne District Council. September 2022

[11] SCION https://www.scionresearch.com/about-us/about-scion/corporate-publications/scion-connections/past-issues-list/issue-9/New-technologies-for-improved-forest-safety

- The extended period of vulnerability post-harvest, of up to eight years
- Climatic conditions - heavy localised rain events have been occurring more frequently. NIWA climate change projections[12] for the region are that more extreme events (including droughts) will be more likely.
- In some instances, there may be non-compliance with consent conditions and/or the national regulations. Due to the nature of the national regulations, often non-compliance can only be proven when a 'failure' occurs

6.4. Previous and current national policy settings and the way that the forestry industry is structured (relying heavily on contractors and subcontractors to carry out the harvest, working to slim margins, with limited security of work) also contributes to land use choices and forestry practices.

6.5. Council is investigating the origins and causes of the woody debris and sediment found in the recent events. Appendix 4 gives an overview of the recent prosecutions from a large-scale event/s in 2018. We are still seeing these types of impacts despite taking a punitive approach with companies who continue to not comply with requirements or who use poor practices.

[12] NIWA Gisborne https://niwa.co.nz/sites/niwa.co.nz/files/WEB%20Gisborne%20Climate%20book2019.pdf

6.6. Impacts on freshwater and coastal ecosystems

6.7. Forestry practices have well-documented impacts on freshwater ecosystems globally. These adverse effects are substantial in freshwater environments (e.g. as outlined in Death and Roil, 2017) and the coastal environment (e.g. as outlined in Johnston et al 2022). Sedimentation can result from the creation of roads to access forests, direct deposition of materials into the waterway, and incidental deposition of materials into the water via slow movement and gullying, resulting in reduced soil stability and increased soil exposure after harvest and prior to canopy closure on second rotation plantings[13].

6.8. There are positive benefits of afforestation for water quality and environmental health are present while the forest is standing. However, the combination of the high volume of earthworks required to install forestry infrastructure, and the discharges of sediment and debris that occur during earthworks and harvest, combine to degrade the quality of freshwater and coastal waters. Many river systems in Tairāwhiti fall below the National Bottom Lines for sediment (visual clarity and deposited sediment) but the tributary streams are less impacted and remain the refuge for native fish species[14].

6.9. When forestry infrastructure is installed, and clearfell harvest occurs, the level of sediment in these streams rises very significantly. It also increases significantly in the receiving rivers, estuaries and the coast – with step changes in sediment levels seen once significant clearfell occurs.

6.10. The accumulation of material, aggradation, causes physical changes to the terrestrial, riparian, and freshwater habitat. Sedimentation in water systems such as rivers can lead to hypoxic conditions where the oxygen concentration is too low to support the diversity of organisms that would naturally inhabit the area.

6.11. The primary impact resulting from the physical movement of P.radiata is demonstrated by the photographs at Appendix 2– deposition of logs and debris on riverbanks and beaches. This affects the plant, animal, and fungal compositions of these systems as the physical habitat is drastically altered. Many riparian plants had been damaged or displaced at the sites, by both debris and silt deposition. The breakdown of this material will also have impacts on freshwater, coastal, and riparian systems by entering a significant amount of organic matter, and therefore nutrients, to environments where this is not a naturally occurring nutrient source, nor a naturally occurring quantity of such matter. These impacts are felt most strongly by mana whenua communities, who often rely on natural freshwater for bathing and drinking and who source kai from freshwaters and the sea. These communities are increasingly concerned and vocal about the impact of sedimentation on their awa and moana. While sediment is also generated from pastoral farmland, it tends to be delivered on a more continual low level basis – rather than in the very substantial pulses with associated smothering effects from forestry harvest. Where sediment is combined with woody debris, scouring out the beds of rivers and smothering shellfish beds, the impacts on Māori communities is very significant.

6.12. Te Aitanga a Hauiti at Tolaga Bay, Ngāti Porou hapū at Tokomaru Bay, Tikapa, and around Tikitiki, Rongowhakaata hapū at Waikanae, Te Wherowhero and Te Arai, and Ngāi Tāmanuhiri hapū at Maraetaha and Te Wherowhero have been the most adversely affected to date.

6.13. **Impacts on infrastructure and property**

6.14. Where public infrastructure such as bridges, culverts and roads are affected by woody debris – or destroyed, central government (through Waka Kotahi) or the Council (for local infrastructure) pay the repair and clean-up costs – often extending into the 10s of millions. For example, the clean-up and repair costs for the 2018 winter storms was estimated at over $10 million, most of this due to damaged infrastructure and roading from woody debris.

6.15. Our roading and water supply infrastructure comprises some of the region's most critical infrastructure along with the highway, power and communication services provided by other entities. This network infrastructure resides within a natural environment that is extremely vulnerable to severe weather events.

6.16. Following the Queen's Birthday storms in 2018, Council recognised that the plantation forest planted to protect the water supply pipeline for Gisborne City would be a risk when harvested and accordingly established the Waingake Transformation project to transition the forest to permanent indigenous forest. It was recognised that this would not afford full protection until the new forest became established. This has proved to be the case with the pipeline suffering a significant number of failures due to the migration of large woody debris from steep slopes which failed during Cyclone Gabrielle.

[13] Wallis G, McMahon S. 1994. The impacts of forest management on erosion and sedimentation: a New Zealand review. Logging Industry Research Organisation report. 19(2) and Quinn JM, Boothroyd IKG, Smith BJ. 2004. Riparian buffers mitigate effects of pine plantation logging on New Zealand streams 2. Invertebrate communities. Forest Ecology and Management. 191: 129- 146.

Figure 6 impacts on infrastructure

Figure 7

6.17. The pipeline from the Bush Intake to the city has now been largely repaired and that this has happened in such a short period of time is entirely the result of the rapid response that the Council could make as the owner of the critical infrastructure. This highlights the value of local ownership of critical infrastructure assets where decisions could be made rapidly by local decision-makers who understood the infrastructure and what the best solutions would be. It is unlikely that this pipeline would have been repaired by now if that decision had to be made by a committee elsewhere without that local knowledge.

6.18. It is a similar situation with the local roading network. The councils roading team is used to the storms we have every year which degrade parts of the network but what has been a factor particularly since 2017 is the impact of large woody debris on bridges. The bridges can generally cope with floodwaters although clean ups and some abutment repairs will be required. Large woody debris is a separate issue and of the 8 bridges destroyed, partially destroyed or severely damaged (11) or adversely affected (41), all but one of those was the result of woody debris becoming wedged up against the bridges.

6.19. Woody debris continues to accumulate on beaches, either through storm events or incrementally over time as vegetation makes its way into our rivers, marine environment and eventually onto the beach.

6.20. Large amounts of woody debris on the beach is a Health and Safety issue and environmental issue, impacting on the general amenity of the area. While the issue of woody debris is best addressed at source, once the woody debris has reached the coastline and marine environment, it is extremely difficult to identify the original landowner, and has become Council's responsibility by default.

6.21. Due to community concerns, Council and the forestry industry have undertaken beach clean-ups, but this has been reactive, and the damage has already occurred to the receiving environment/s.

6.22. Woody debris remaining in river catchments poses a risk to bridges and may exacerbate flooding in some catchments.

6.23. Landowners affected by deposition of woody debris are generally left with paying the costs of clean up and remediation. This includes replacement of flood gates and fences, and removal of debris from paddocks.

7. IMPACTS AND EXPERIENCES DURING CYCLONES HALE AND GABRIELLE

7.1. Over two days Cyclone Gabrielle brought 547mm to Raparapaririki (Waiapu) the highest rainfall in the district, and 500mm to Mangapoike by the water supply dam in Waingake. Cyclone Gabrielle resulted in a State of Emergency being declared that lasted a month. At the peak of the event, the Waipaoa River water level reached 12.8m; the Waiapu River reached 8m, which is the highest level recorded since 1975; and the Te Arai River 4.9m, the highest recorded since 1983. The Hikuwai River reached around 14m, for context the Cyclone Bola level was 14.3m.

7.2. Damage was exacerbated by large volumes of woody debris (including forestry slash) and sediment in many places including Tolaga Bay and the Waiapu catchment. An example of the source of woody debris below with terms explained in Definitions at the end of document.

Waikanae Beach	Number	%
Long resident pine logs	157	49%
Pine RB	35	11%
Fresh cut Pine	8	3%
Pine obvious cuts	7	2%
Fresh cut to waste	15	5%
WPA	45	14%
Indigenous	41	13%
Fence Posts etc	11	3%
Totals	319	100%

Table 1 Example of source of woody debris

7.3. **Impacts on livestock**

7.4. Stock losses from flooding resulted in significant loss for some landowners. Significant areas of grazing land (pasture and crops) were covered with sediment and some land captured by riverbank erosion. Fences and floodgates were lost or disrupted resulting in difficulties in retaining and controlling livestock.

7.5. Transporting stock to alternative grazing or the freezing works has been severely disrupted due to road closures in parts of the district. This has led to exploring alternative such as droving across properties to get access to transport. This is difficult due to terrain and many people no longer have droving horses as they rely on motorised vehicles. It also has other risks such as river crossings etc. where flow can be high due to ongoing rain events. There are some properties that will have issues with feed as we head into winter if they cannot offload stock.

7.6. **Impacts on infrastructure**

7.7. At the peak, some 60 local roads were closed, and several have reduced levels of services; there are ongoing road closures at short notice to clear fallen trees. Today 30 roads closed, 20 bridges closed, and 9 roads closed to heavy vehicles. Hikuwai Bridge and Mangahauini Gorge repairs will take several months to complete.

7.8. Many bridges were destroyed (black in table below) and the Council is working with local industry for solutions to replace and building back stronger. Eleven are still standing but with major structural issues (red); forty-one are still standing but with structural issues (orange). Green are minor repairs such as approach railings. Disruption was increased as many of these bridges also carry vital infrastructure.

Table 2 Regions Bridges impact

Current summary

No. of Bridges	Black	Green	Orange	Red	Not Inspected	Total
Hikurangi		66	5	3		74
Turanga		35		1		36
Uawa	4	58	16	3	4	85
Waipaoa	7	194	20	4	2	227
Total	**11**	**353**	**41**	**11**	**6**	**422**

7.9. The increased frequency and intensity of events nation-wide is putting a high demand on the national emergency works fund. Council seeks a review of Waka Kotahi's Emergency Work Policy, which is capped at an organisation's normal FAR (Financial Assistance Rate) plus 20% to a maximum of 95%.

7.10. **Impacts on Land**

7.11. Soil erosion is evident on all land uses with the extent and severity dependent on the intensity of rainfall events and the land use. Inundation of sediment on valuable alluvial flats is extensive. Reactivation of existing erosion scars is evident throughout Tairāwhiti

7.12. Gully plantings have performed very well on farmland and in the limited gully plantings within forest blocks. Gully erosion has been significant in areas where no conservation planting has occurred.

7.13. Severe slip damage has occurred on steeper land with thin and skeletal topsoils in areas where very intensive rainfall has occurred.

7.14. Slump and slope movement on easier slopes is less evident but this form of erosion is often activated by prolonged wet weather. This may be experienced if a wet winter follows the wet summer and autumn to date.

7.15. Many of our existing disposal sites for sediment and woody debris have reached capacity, and disposal is a growing challenge.

7.16. **Impacts on Forests**

7.17. Mature forestry on easier slopes has performed well, the movement of whole slopes has occurred on steep slopes, where significant soil erosion was the reason for initial establishment. In places, slope collapse can be attributed to high river flows resulting in riverbank erosion particularly on outside bends of streams and rivers.

7.18. Some alternative exotic species appear to have performed well, these areas are small in extent and assessment of their success will need to include the extent of historic and existing erosion and the impact of the cyclones on this land. This includes eucalyptus, acacia and redwood planting along with assessing of performance of a range of indigenous species on eroding land.

7.19. The effect on indigenous forest has seen some slope movement, a protection management area of primary bush has slumped, and some riparian collapse alongside waterways has occurred in the steeper forests. Regenerating scrub has held slopes well although there has been gullying on erosion prone slopes, which would have been worse under pasture. Such forests have not been a contributor of large woody debris.

7.20. **Impacts on Rivers**

7.21. Large volumes of sediment and woody material has entered waterways throughout Tairāwhiti. This has resulted in a significant loss in capacity within the beds of Tairāwhiti waterways' which increases the risk of flooding from ensuing rainfall events.

7.22. Riverbank and streambank erosion have occurred throughout with new episodes of erosion evident as bed levels rise and adjoining slope toes are exposed to high flows during intensive rainfall events. Trees that were previously some distance above the bed level are now collapsing into the waterway and being carried downstream.

7.23. Aggradation and riverbank erosion have resulted in disruption to bridges and assets alongside riverbanks.

8. STATUTORY FRAMEWORK AND POLICY CONTEXT

8.1. This section briefly outlines current policy framework; and the use of current legislation, policies and rules that influence the way we use land, what works well, what is unhelpful; and market drivers and conditions, regulations, rules and the way in which requirements are enforced.

8.2. **LEGISLATION**

8.3. **The Resource Management Act 1991 (RMA)**

Land and water management in Aotearoa New Zealand is largely managed within the framework of the RMA.

Section 5 sets out the purpose of the Act, which is to promote the sustainable management of natural and physical resources[14]. This includes *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and avoiding, remedying or mitigating any adverse effects of activities on the environment.*

This is clearly not functioning for forestry in Tairāwhiti as set out in the act.

8.4. **Soil Conservation and Rivers Control Act 1941 (SCRCA)**

The purpose of the SCRCA is to promote soil conservation, prevent and mitigate soil erosion, prevent damage by floods, and use land to achieve these purposes. Council owns and manages flood protection and drainage assets across Tairāwhiti. Catchment boards were able to be established under the Act and were responsible for the activities in their catchment district.

Under the SCRCA, catchment boards had several functions, including:[15]

- Minimising and preventing damage by floods and erosion

[14] Section 5 RMA https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM231905.html
[15] Section 126, SCRCA.

- Constructing, reconstructing, altering, repairing, and maintaining all works necessary for: controlling or regulating the flow of water towards, into, in, and from watercourses; preventing or lessening any likelihood of the overflow or breaking of the banks of any watercourse and any damaging arising from those overflows or breaks; preventing or lessening erosion or the likelihood of erosion.

These catchment board functions are inherently to environmental outcomes for land and fresh water. This is a very old Act, and large sections have been repealed. Due to age it fails to address some more modern situations and commercial arrangements.

8.5. **Climate Change Response Act 2002 (CCRA)**

The CCRA establishes the legal framework to enable Aotearoa New Zealand to meet its international obligations under the United Nations Framework on Climate Change, the Kyoto Protocol and the Paris Agreement.[16]

The CCRA requires the Government to set emissions budgets and emissions reduction plans to achieve domestic targets. The NZ ETS is the Government's primary policy tool for reducing greenhouse gas emissions. The NZ ETS establishes a price on greenhouse gas emissions in the form of an 'emission unit' – also known as a 'New Zealand Unit (NZU)'. All sectors of the country's economy must measure and report their emissions and, if required to, purchase NZUs that they can surrender to the Government to cover their emissions.

Relevance to this topic: The NZ ETS incentivises afforestation by allowing eligible foresters to earn NZUs from the Government as their trees grow and absorb carbon dioxide, which they can then trade on the market. The NZ ETS drives increased Carbon Forestry (in a category *permanent forest*) planting, which are not covered under the National Environmental Standards for Plantation Forestry (NES-PF).

8.6. **Biosecurity Act 1993**

The purpose of the Biosecurity Act[17] is to enable "*exclusion, eradication, and effective management of pests and unwanted organisms*".

Biosecurity functions are split between the Ministry for Primary Industries (MPI), other governmental departments and regional councils. Regional councils are responsible for undertaking monitoring and surveillance of established pests and to prepare and implement regional pest management strategies.

Relevance to this topic, wilding conifer control is carried out under the Biosecurity Act and individual regions set strategies to control pests. Other pests also have impacts on indigenous biodiversity and species, soil erosion, water bodies and freshwater ecosystems.

There is a real need for more comprehensive animal and plant pest control to assist in establishing functional riparian areas within forests, indigenous bush and within farmland. Due to current pest levels the funding we have available can't cover all the needs and we are reliant on private landowners to finance pest control.

[16] In 2019, the Climate Change Response (Zero Carbon) Amendment Act committed New Zealand to reducing greenhouse gas emissions by 2050 in line with global commitments under the Paris Agreement.
[17] Bio Security Act 1993 https://www.legislation.govt.nz/act/public/1993/0095/latest/DLM314623.html

8.7. **Local Government Act 2002 (LGA)**

Section 10 of the LGA sets out the purpose of local government. This includes promotion of the social, economic, environmental, and cultural well-being of communities in the present and for the future.

Under the LGA, Council may prepare bylaws for managing, regulating against, or protecting from, damage, misuse, or loss, or for preventing the use of, the land, structures, or infrastructure associated with water supply, land drainage and water races.[18] These have limited impact alone without enabling legislation to specify penalties. There are few bylaw prosecutions for a number of reasons including substantial evidence to be successful, which in itself takes financial and staff resources.

Relevance to this topic, bylaws are sometimes suggested as a solution, in this circumstance they are not suitable as they have even lower cost recovery amounts through prosecutions.

8.8. **Other Legislation**

In addition to the key pieces of legislation outlined above, there is a suite of legislation relevant to the management of land and freshwater. These statutes include:

- Reserves Act 1977
- Civil Defence Emergency Management Act 2002
- Local Government Act 1974
- Hazardous Substances and New Organisms Act 1996
- Fire and Emergency New Zealand Act 2017
- Health Act 1956
- Building Act 2004
- Conservation Act 1987 (currently under review)
- Water Services Act 2021.

Relevance to the topic all of these may have an impact on the solutions or may assist, for example the review of the Conservation Act may assist with land that effectively needs to be retired from production. Perhaps *protection forests* into reserves.

8.9. **National Direction under the RMA**

8.10. **National Policy Statement for Freshwater Management 2020 (NPSFM)**

The NPS-FM is highly relevant to this topic as many of the impacts of forestry activities (both positive and negative) are felt in the freshwater environment.

The NPS-FM establishes the fundamental concept of Te Mana o Te Wai as the basis for freshwater quality and quantity management in Aotearoa New Zealand.

Te Mana of te Wai encompasses six principles, along with the hierarchy of obligations to ensure that natural and physical resources are managed in a way that prioritises:

- first, the health and well-being of water bodies and freshwater ecosystems
- second, the health needs of people (such as drinking water)

[18] Section 146(1)(b), LGA.

- third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

Relevance to this topic: It is difficult to understand how the NES-Plantation Forestry can be assessed as giving effect to Te Mana o Te Wai in Tairāwhiti.

8.11. **New Zealand Coastal Policy Statement**

The NZCPS provides national direction on sustainable management of the coastal environment. The preamble in the NZCPS notes that activities inland can have a major impact on coastal water quality, and that there is poor and declining water quality in many areas as a consequence of point and diffuse sources of contamination. It is therefore important to consider the interconnections between land and freshwater and the coastal environment.

Relevance to this topic: The NES – PF places very limited restrictions on the water quality of discharges from forestry infrastructure and harvest. However, both the NPS-FM and NZCPS are clear that it is not acceptable to either degrade waterbodies that are not degraded or do nothing in a situation where degradation exists. It is unlikely – and may be impossible to meet the NPS-FM and NZCPS requirements around sediment in particular, without placing further regulation over forestry activities to protect freshwater and the coast.

8.12. **National Environmental Standard for Plantation Forestry (NES-PF)**

The NES-PF provides nationally consistent regulations to manage the environmental effects of **plantation** forestry, covering eight core plantation forestry activities and allowing these to be carried out predominantly as permitted activities subject to permitted activities conditions on Low, Moderate and High Risk Zone but subject to controlled activity resource consents for harvesting and replanting on Red Zone and restricted discretionary activities for afforestation on Red Zone to manage potential effects on the environment. **The NES-PF provides a highly permissive regulatory regime.**

The NES–PF has different levels of regulation depending on the Erosion Susceptibility Classification (ESC). This is shown in Table 2 for harvest.

Table 2 Plantation forest harvest – activity status

Erosion susceptibility	% land in Tairāwhiti	Activity status for harvest	Can consent be declined?	
Green (Low Risk),	3%	Permitted	No	
Yellow (moderate erosion susceptibility),	30%	Permitted	No	
Orange (high erosion susceptibility),	12%	Permitted	No	
Red (very high erosion susceptibility).	55%	Controlled	No	
Red – Land Use Class 8e	Small subset of the red zone	Restricted Discretionary	Yes	But no policy guidance on when a consent

				should be declined.

8.13. **Iwi/Hapū Management Plans and Other Mechanisms**

8.14. **Iwi/Hapū Management Plans**

In addition to the legislative framework and national guidance documents above, hapū and iwi management plans are also a relevant consideration to the management of land and freshwater. Hapū and Iwi Management Plans identify resource management issues important to tangata whenua and iwi and resource management strategies for sustainable development of natural and physical resources.

8.15. **Ngā Ariki Kaiputahi Hapū/Iwi Management Plan 2012**

The Nga Ariki Kaiputahi Hapū/Iwi Management Plan provides general principles for kaitiaki/management of natural resources. The IMP covers all tribal lands, waters and resources of Ngā Ariki Kaiputahi.

Relevant to this topic, the IMP includes direction to:

- Engage and consult with Ngā Ariki Kaiputahi and include them in decision-making processes.
- Regularly monitor cumulative effects and disturbances, removal or indirect removal of habitat and impacts on wildlife.
- Uphold and document sustainable best management practices in disturbed areas.
- Reduce access so that ground cover is disturbed as little as possible.
- Avoid the harvesting and pruning of natural shade cover.
- Avoid and limit the introduction of non-native species.
- Encourage natural re-vegetation by indigenous flora and fauna and avoid the removal of vegetation, topsoil and seed source unless it is for Te Ao Māori and Te Ao Wairua purposes.
- Reduce surface disturbance and soil erosion thereby reducing reclamation needs and promoting natural regeneration.
- Plant native trees on slopes to counteract erosion and in unproductive areas of land.
- Avoid pollution of rivers and streams and the disposal and release of contaminated waters within their tribal boundaries.

8.16. **Te Aitanga a Māhaki Iwi Environmental Inventory (2006)**

Te Aitanga a Māhaki Iwi Environmental Inventory provides a framework that allows Te Aitanga a Māhaki iwi along with local/central governments to evaluate/enhance local rivers/waterways whilst educating and empowering its people.

The Environmental Inventory contributes to the overall vision of the iwi to 'restore the mauri of the Waipaoa'.

Key objectives relevant to this topic include to:

- Map wāhi tapu and other significant traditional areas.

- Identify the important rivers, streams, wetlands, lakes, rivers (water resources) in the rohe.
- Identify flora and fauna and their cultural, recreational, commercial importance.
- Identify significant regional water issues for iwi.

The Environmental Inventory includes a range of actions, including but not limited to:

- Developing catchment-based strategies to protect land and encourage well-suited land uses, re-establish an inter-connected forest network, sustain minimum water quantity and quality standards, restore wetlands and riparian plantings, and select tributaries for restoration of habitat of fisheries and other resources.
- Developing a catchment monitoring programme.
- Developing and disseminating educational materials and guidelines on the value of catchment base planning.
- Surveying and selecting sites for wetland and river habitat restoration, developing sites and planting harakeke beds, and monitoring habitat recovery.
- Developing catchment-based strategies for the recovery of tuna.

8.17. **Statutory Acknowledgements**

Ngā Whakaaetanga ā Ture mō Te Tairāwhiti contains the statutory acknowledgements from Te Tiriti o Waitangi settlement legislation within the Tairāwhiti region.[19] A statutory acknowledgement is a mechanism within a settlement that provides a formal acknowledgement by the Crown that recognises the specific cultural, spiritual, historical and traditional association of Iwi, with a site of significance or resource identified as a statutory area.

Table 3 Statutory Acknowledgements

[19] https://www.gdc.govt.nz/__data/assets/pdf_file/0025/41839/Nga-Whakaaetanga-a-Ture-mo-te-Tairāwhiti-Statutory-Acknowledgements-of-the-Gisborne-District-updated-June-2022-A2566712.pdf

Iwi	Statutory Acknowledgements
Ngāti Porou	• Waiapu River and its tributaries upstream of the CMA • Uawa River and its tributaries upstream of the CMA • Tūranganui River and its tributaries (to the extent that this area is within the area of interest), upstream of the coastal marine area • Waimatā River (as a tributary of the Tūranganui River) to the extent that this area is within the area of interest), upstream of the CMA
Ngai Tāmanuhiri	• Ngai Tāmanuhiri CMA • Part Waipaoa River (including Karaua Stream)
Rongowhakaata	• Tūranganui River within area of interest • Taruheru River within area of interest • Waipaoa River within area of interest • Waimatā River (including Karaua Stream) within area of interest • Hangaroa River within area of interest • Te Arai River within area of interest • Waikanae Creek within area of interest • Rongowhakaata CMA within area of interest
Iwi and hapū of Te Rohe o Te Wairoa	There are also several statutory areas for iwi and hapū of Te Rohe o Te Wairoa that fall within the Tairāwhiti region's boundaries, including: • Nuhaka River and its tributaries • Wairoa River and its tributaries • Hangaroa River and its tributaries • Mangapoike River and its tributaries • Ruakituri River and its tributaries

8.18. Codes of Practice

Several guidelines and codes of practice[20] have been produced for the *plantation* forestry industry. They sit outside of the RMA and other legislation and do not have any statutory weight; however, prosecutions and judgements reference them and failures to comply. As they feature a level of detail and specification there may be routes to incorporate into to legislation such as the Forests Act. This adoption has been done in the past with health and safety codes, particularly if voluntary codes are not being followed.

[20] The New Zealand Environmental Code of Practice for Plantation Forestry https://www.nzfoa.org.nz/resources/file-libraries-resources/codes-of-practice/44-environmental-code-of-practice/file

9. WHAT IS COUNCIL DOING TO ADDRESS WOODY DEBRIS AND SEDIMENTATION ISSUES

9.1. **Changing the regional rules**: Council has commenced a review of the Tairāwhiti Resource Management Plan – it is a combined regional policy statement, regional plan, coastal plan, and district plan. The plan review provides an opportunity for Council and its community to consider longer term land use changes to manage the effects of climate change and plantation forestry in the region and achieve other environmental outcomes. The plan review process takes time however and any Government intervention to create change would still be an important part of addressing the issues we face and will provide national level policy support to what could be a contentious and litigious process.

9.2. Changes being considered are:

- Restricting/preventing certain land uses (such as plantation forestry) on high-risk land.
- Restricting how much of an area or catchment can be harvested within a set time period.
- Introduction of significant riparian areas supported by intensive pest control are essential.
- Introduction of bonds or financial contributions for higher-risk land use activities.
- Requiring removal of more woody debris from slopes and landing sites. The Visser report recommends 6% residual material left at harvest areas and 4% on high-risk areas.
- Restricting landing sizes.
- Setting maximum sediment and woody debris discharge contaminant limits.

9.3. **Applying for an enforcement order[21] to require removal of residual slash and woody debris any other remediation required.** Work is under way to establish a taskforce to undertake the necessary work, with a Special Operations Lead appointed in February 2023. This is not a quick or cheap process with the burden of proof on the Council and undertaking requires a high level of evidence to start with.

9.4. **Review of Resource Consents.** It is unlikely that a review of the consent conditions of all forestry consents would be possible under the RMA. It would also be a costly and lengthy exercise given each review is treated as a normal resource consent application. Staff have identified four initial consents which could be considered for review and have prepared an action plan. Further reviews may follow.

9.5. Staff are reviewing and making changes to the suite of consent conditions commonly used and also considering whether some consent applications should be publicly notified given the current knowledge regarding potential effects.

[21] S.314-321 RMA https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM238529.html

9.6. **Ongoing compliance, monitoring and enforcement work**

9.7. Council notes and accepts that following its prosecutions of 5 parties in relation to 6 forests after the Queens' Birthday storms of June 2018, Judge Dwyer was critical of Councils' compliance record for two of those forests, namely Waituna and Paroa Forests. The Judge did not criticise the Council for its compliance record in the remaining forests including the largest forests involved in the prosecution.

9.8. Council's own detailed investigation into the impacts of Cyclone Cook in 2017[22] resulted in several recommendations. These included:

1 That in the short term, Council adopt or adapt one of environmental guidelines used by other Councils and work with other councils to understand the tools and practices that have been employed to take into account issues not fully addressed in the National Environmental Standard (NES) for planation forestry. The NES provides guidance for good practice but further work is required to ensure that this good practice is implemented on the ground.

2 That comprehensive Assessments of Environmental Effects are required for all forestry harvest consents, taking into account the existing environmental values and the measures to be adopted to mitigate those effects (See schedule 3 of the NES for plantation forestry).

3 That where practicable, existing harvest consents are reviewed to ensure that the procedures within those consents are fit for the purpose of mitigating against the environmental impacts of the harvest operation and that this is measured against NES environmental guidelines (See schedule 3 of the NES for plantation forestry).

4 That consents where existing or proposed landings are within flood plains are reviewed to ensure that existing landings are protected from flood impacts and alternative sites are identified for proposed landing sites (See schedule 3 of the NES for plantation forestry).

5 That the effectiveness of current monitoring is reviewed and that cost-recovered compliance monitoring is undertaken on a business as usual basis (See schedule 3 of the NES for plantation forestry).

9.9. Council engaged with both the public and directly with the forestry industry following the completion of the Cook report. It is fair to say, as noted by the reports principal author during oral submissions, that the reception the forestry industry to the report was robust to the extreme. The author, who is an experienced Environment Court Expert witness, has commented that the dialogue was more robust than he had experienced in any court or Royal Commission proceeding.

9.10. The Cook report was followed by a review of council's consents, compliance and environmental science teams in 2018 and a subsequent restructure to better align Council structure into regulatory and non-regulatory functions. Regrettably, the Queen's Birthday storms of 2018 occurred before this new structure could be put in place. Fortunately, Council was able to call on expertise from Bay of Plenty as well as the technical expertise it had in place because of the Cyclone Cook investigation to ensure that post-event compliance inspections took place and that forests with significant non-compliance were identified and investigated.

[22] Cave, M. P., Davies, N., Langford, J., (October 2017) Cyclone Cook Slash Investigation. V3.5. 106p.+appendices.

SOLUTIONS UNDER THE CURRENT SYSTEM	
To complement controls via the NES PF, a slash management plan (within **Forest Environment Plans**) should be required as part of the permitted activity in Green/ Yellow/Orange (most), and for a resource consent application for harvesting on Orange/Red Zone land. They could consider a wide range of options to address plantation forestry management:	Long term binding **Forestry Environment Plans** (that include slash management plans) Setbacks: inclusion of realistic case by case Biodiversity setbacks: 5 and 10 m have proven inadequate. Require direct actions within setback areas such as *high stumping* is required to harvested trees to a height of 1.0 metre within one tree length of the permanent 'biodiversity set-back'. Increased stringency is required for harvesting and replanting
Require a further Risk Zone for Extreme Risk, a "Purple" zone where *plantation* forestry should not take place. Some of the areas are shown in figure 6. We believe many sites should now be re-planted or aerial sown (drone) with un-palatable native species such as manuka, kanuka, tutu, rohutu which will allow recovery without negative browsing impact from ungulates	Erosion Susceptibility Classification (ESC) use at a realistic scale with further attributes considered. These in turn underpinned by rules that are more stringent than the NES-PF in the Councils emerging Land use plan (replacing the TRMP) examples at Appendix 3. Hold settings at strategic points.
Safe storage or removal (as a valuable raw material) of wood debris from landings, especially in steep slopes. Harvesting methods that minimise breakages and place potential slash in safe sites. Partial catchment (coup) harvesting[23]	Location and timing of installation of slash catchers Consideration of the potential for slash to be generated from the harvested slope (less likely on easier slopes and further from waterways). Introduction of live slash retention plantings at harvest to protect the site at the subsequent rotation harvesting. Retention of riparian vegetation.
RMA Prosecution changes **Greater cost recovery** **Higher fines** **Remove option** for offenders to elect a jury trial.	Enable Council to recover more from prosecutions. This would help offset high legal costs and allow remediation of impacts. Polluter or the ratepayer pays Increase maximum fines available for criminal prosecutions. **Any fines imposed**

[23] Alternatives to clearfelling for harvesting of radiata pine plantations on erosion-susceptible land Mark Bloomberg, Eric Cairns, Denny Du, Harriet Palmer and Chris Perry NZ Journal of Forestry, November 2019, Vol. 64, No. 3 http://www.nzjf.org.nz/free_issues/NZJF64_3_2019/5D9ABDDD-40ED-494f-BE1F-BE5BE4AF5A64.pdf

Inclusion of civil sanctions as a tool to respond to offences when traditional prosecution is not the best tool	**should be reflective of the environmental, infrastructure and social impact of the offending.** No jury trial would reduce delays and costs associated with prosecutions
Changes to the Tairāwhiti Resource Management Plan (ideally supported by national direction)	
New overlay (riskiest land)	The *purple zone* (referred to above)
Reduce volume of woody debris – logging residues removed; slash at landings removed	Tighter controls on harvest; drive land use change
More substantial setbacks	To provide a natural buffer between harvest areas and waterways
Area based restrictions on harvest in catchments/sub catchments	Reduce the amount of land that is vulnerable until a vegetation has re-established
Carbon and Conservation Forests	Content to expand aspects from the NESPF to all Forests
Manufacturing Clusters to stimulate demand for Biomass	Provisions to enable development of manufacturing clusters. As the new RMA system that will provide RSS is not in place for a number of years.
POST RMA IMPROVEMENTS UNDER THE NBA, RSS and NPF	
RSS **Manufacturing Clusters** to stimulate demand for Biomass	Details in section below.
Limitations of the NES-PF to provide content into plans will be provided for by the NPF.	Greater ability to incorporate into plans, see below.
Incorporation of the Forestry Owners Association *Voluntary* **Code of Practice** into the system.	Details in section below.
New approaches to land-use could be explored through the development of the Regional Spatial Strategy (RSS) which will be required by the new Spatial Planning Bill currently being considered by Select	Central government buy-in and investment will be critical to achieving transformational change.

Committee. However, this is not an immediate solution.	
Creation and implementation of biodiversity credits	A system is needed to incentivise transition to a more sustainable land use on the most vulnerable land that also provide multiple positive outcomes
ROADING	
Review of **Waka Kotahi's Emergency Work Policy** Collaborate with other councils impacted by weather events like Wairoa and Tasman likely similar issues.	Policy is capped at an organisation's normal FAR plus 20% to a maximum of 95%. Bespoke application for 100% is already predetermined.
TECHNOLOGY	
Greater use of technology such as drones and tagging.	Could be set out in RMA or the Forests Act. Details in section below.

10. FURTHER DETAILS ON SOLUTIONS OUTLINED

10.1. **Forestry Environment Plan** addresses some of the current gaps in the NES-PF, while it addresses how to deal with latter stages of the plantation forestry lifecycle (earthworks, harvesting) there is an opportunity to better consider these long term effects at planting. An added bonus could be clarification for the intention of forests, that is plantation, carbon or exotic to native carbon to conversation forest and so on. This is difficult for the NES-PF to cover as it was designed for plantation forests**.**

10.2. The NES-PF definition of slash includes all harvest residues irrespective of size and is not consistent with widely accepted definitions. Those widely accepted definitions are more specific and refer to scrap timber, branches and offcuts left behind in a felling area or as coarse and fine woody debris generated during logging operations.

10.3. There are benefits to leaving some slash on slopes to protect soils from infiltration and sediment loss but there are no environmental benefits in leaving harvest residues, be it cut logs, or felled to waste logs, slovens, or recovered root balls on slopes.

10.4. The NES-PF should differentiate between slash and harvest residues to reduce the risk of it being perceived that it is acceptable practice to leave harvest residues on vulnerable slopes. The NES-PF should have strong controls over the management of such harvest residues.

10.5. If the NES-PF is amended improvements to long term outcomes would be provided by incentivising soil conservation and long-life span species. In addition, promoting ongoing retirement of plantation forestry in eroding areas (remove the incentive to clear land for fast growing plantation species) ideally transiting to native species these would all act as a carbon sink.

10.6. **Carbon Forestry:** Beyond the generation of woody debris from natural forests and Plantation Forests, Carbon Forestry (forests for carbon sequestration purposes) are likely to generate some debris that should be managed. Although there is likely to be less material generated than during the harvest of a plantation forest there is potential from limited harvest, thinning or in active models that transition to natives over time. Of concern is the establishment of trees on highly sensitive (very steep or in close proximity to waterways) which is currently less regulated. It is a somewhat of a myth that Carbon is unregulated many aspects such as the Biosecurity Act, Fire and Emergency New Zealand Act still apply.

10.7. In recent years there has been calls for more regulation of Carbon Forestry and the suggestion of inclusion into an updated/ expanded NES-PF or introducing an alternative National Direction. The NESP PF was created specifically around planation forestry and the management of its effects it would be very difficult (and time consuming) to do this. A more immediate solution would be to link the financial returns to Forestry Management Plans or a code of conduct similar to the Forest Accords24. Aspects of Forestry Management could be specified such as pest and debris management and the NZ ETS already specifies compliance with other requirements such as the RMA.

10.8. Within MPI Future of Forests it sets a vision for the future for Plantation Forestry and wood processing to expand the green economy**25** including sustainable management of Carbon Forestry. Building on this and the outline of other MPI programmes this should include

- Gully and Waterway Protection and Maintenance

- Long Term and Sustainable Vegetation Cover
- Embrace Technology Changes and Innovation

10.9. As part of the more long term sustainable practises **drone technology** is emerging for a variety of forestry purposes. They have improved the monitoring of Forests; and could assist with seed application to erosion prone sites; wilding pine control; release spraying without aerial desiccation tasks such as pest management, harvest planning, and more recently thinning and even harvesting. Part of the Embracing Technology could be greater use of the 'tagging' of logs with greater identification**26**.

10.10. New Zealand companies have begun to utilise technology that is commonplace in Scandinavia. The potential for thinning and harvest via drone provides many wider benefits The reduction of the need for roads that are normally required during thinning, can in itself require the felling of more trees, create deep tracks in the ground and damage other vegetation and roots.

10.11. Since 2018 MPI has been considering market development initiatives for biomass (from woody debris) in February 2023[27] a proactive release details of programmes to stimulate demand for the biomass, methods to retrieve slash and what it might be used for.

10.12. A difficulty of the RMA its national direction regime, is that it involves the separate development of national environmental standards and national policy, rather than the development of an integrated national policy framework. This is itself complicates solutions and the speed of material into land use plans. Many of the issues the NES-PF is trying to achieve would be better suited to a National Policy Statement. This is eventually proposed to be addressed through the Natural and Built Environments Act, which will require the development of a National Planning Framework (NPF). The Government has an option for very prompt action in the form of Regulations under section 72 of the Forests Act[28] which allows many aspects including prescribing the terms, conditions, and securities upon which money may be advanced to persons, local authorities, and companies for the establishment, maintenance, and protection of forests. There are also wide ranging powers under s.330 of the RMA.

10.13. Under the replacement RMA system, the new RSS for the region could include Forestry related Manufacturing Clusters located near existing forestry support infrastructure like processing facilities. The idea has been suggested by MPI that they would Identify internationally competitive technologies, develop products and systems to better utilise wood by-products and enable a bio-economy**[29]**. The report details how a problematic by-products such as Forestry Slash can be transformed into a useful raw material for products such as wood based liquid biofuel**[30]**. There is also a growing market for buildings insulation and soundproofing along with construction materials from recycling wood material.

[26] Log tagging information https://fgr.nz/documents/download/4097
[27] MPI briefing *Programmes and initiatives to manage forestry slash* https://www.mpi.govt.nz/dmsdocument/55978-Programmes-and-initiatives-to-manage-forestry-slash-AM23-0087-Cabinet-paper
[28] S.72 Forests Act 1949 https://www.legislation.govt.nz/act/public/1949/0019/latest/DLM257413.html#DLM257413
[29] Ibid
[30] Te Uru Rākau NZ Wood Fibre Futures Project Stage Two Final Main Report 2021 https://www.mpi.govt.nz/dmsdocument/51007-NZ-Wood-Fibre-Futures-Project-Stage-Two-Final-Main-Report

10.14. As RSS have not been finalised details of Manufacturing clusters and criteria of the retiring of plantation forestry land that could be prepared via a National Policy Statement to be carried into the National Policy Framework of the new RMA system.

10.15. Bioeconomy not burning. Nationally there has been a move to convert coal fired heating to wood biomass (mainly pellets or chips), while some of this material could be processed for this sort of use it is not without its problems. Internationally, European Union and Government subsidies are being withdrawn for a number of reasons such as the health implications of particulates produced and that it can drive demand for fresh timber (not slash) to be processed. The demand eventually becoming a driver of deforestation[31]. The Council has resisted short term solutions such as burning, In some instances, burning may still be required for either logistical reasons or because of the scale of the problem is urgent from an environmental or health and safety risk point of view, however alternative solutions are required in the long term.

10.16. The issues of burning such volumes of wood waste has significant implications in its release CO2 as well as particulates. Mulching or chipping provides an opportunity to add to soil carbon thus sequestering CO2. It is not possible to undertake the work without the use of heavy machinery which will emit CO2, however, longer term options will include use of wood wastes as a feedstock offsetting emissions. Allowing pine wood wastes to decompose in "birds' nests" in forests or end-of-life willow and poplar is not carbon neutral and has an equivalent CO2 profile to burning.

10.17. Regarding land that that has been identified as needing to be retired into long term vegetation cover, considerations should be:

- Species: planting, seeding. reversion or a combination
- Transition from existing shorter-term species to long term vegetation cover.
- Introduction of Land Overlay 3B: Retirement Land, Needs to be considered in a similar manner to LO3A
- Slopes and geology
- Catchment Size
- Vegetation options such as native forest
- Mapped at 1:10,000, use of mapping (several options and complimentary options): scales important to identify land for retirement.
- Off site considerations: infrastructure and receiving environments

10.18. What should not be changed is the region's ability to feed into developing solutions to addressing a problems by establishing a Tairāwhiti Land Use Task Force (or Commission) with input from:

- Tangata Whenua
- Local Government
- Government Departments such as MPI/MFE/LINZ Support
- NGOs
- All Land Uses
- Community Input
- Research Entities

11. GENERAL FEEDBACK

The Council is disappointed that after some initial reluctance on the part of the Government to hold this Inquiry at all, it is not a binding Inquiry under the Inquiries Act 2013. We sincerely hope the outcomes and solutions are given due consideration that results in action as our community needs there to be intervention.

12. DEFINITIONS. Not all have been used in this submission but they are terms that will assist the Inquiry[32].

Biomass. Any woody material in a forest. Refers to both merchantable material and material left following a conventional logging operation. In the broad sense, all of the organic Managing Harvest Residues on Steep Terrain Page 6 material on a given area; in the narrow sense, burnable vegetation to be used for fuel in a combustion system.	
Carbon Forestry Carbon forestry (sometimes called carbon farming) is the planting of trees to offset carbon emissions. In New Zealand, eligible foresters can enter their trees into the scheme and earn carbon credits that can then be sold to emitters in the NZ ETS. This is because forests can earn New Zealand emission Units (NZUs) as trees grow and absorb carbon dioxide. The activity of Carbon Forestry as a land use is often confused with the category within the NZ ETS titled 'Permanent Forest', while it is a long term activity it is not permanent.	
Cut-over: The forest area that has been clear-cut is referred to as a cut-over. This area excludes the landings and roading infrastructure	
Debris flows: "geological phenomena in which water-laden masses of soil and fragmented rock rush down mountainsides, funnel into stream channels, entrain objects in their paths, and form thick, muddy deposits on valley floors." Note that 'debris flows' by definition includes 'entrained objects' which for forest harvested areas will include 'harvesting residues'. Landing: also called a skid, or a deck, is an area that is cleared in the forest where the stems and or logs are extracted to for processing, storage and subsequent loading onto trucks for transportation to market.	
Debris Slide: "a mass of predominantly unconsolidated and incoherent soil and rock fragments that has slid or rolled rapidly down a steep slope when comparatively dry to form an irregular hummocky deposit."	
Dross Very small, disseminated pine or other wood debris which may include bark, waratah waste and a mix of fine woody "mash". This material will not be all pine and will likely include willow, poplar or other introduced species or indigenous wood material	
Fence posts and battens and rubbish *As LWD migrates downstream during a flood it will often "take out" any fences standing it its way. Similarly, some waste transfer stations are presently in flood zones and consequently, a wide mix of rubbish can be incorporated to the woody debris in the receiving zone*	

[31] EU Parliament groups rally behind plans to end biomass subsidies https://www.euractiv.com/section/biomass/news/eu-parliament-groups-rally-behind-plans-to-end-biomass-subsidies/

[32] Some of the definitions credit to, Visser, R., Spinelli, R. and Brown, K. (2018) Best practices for reducing harvest residues and mitigating mobilisation of harvest residues in steepland plantation forests. Canterbury School of Forestry, Envirolink Report 1879-GSD152 for Gisborne District Council

Harvesting Residues: should be the preferred term in the forest industry for material left onsite post-harvest. The definition for residue is "a small amount of something that remains after the main part has gone or been taken or used". As such it can refer to all material left on site after harvesting has been completed, but also recognise that it might still have value. The benefit of this term is that it includes merchantable stems and or logs left onsite, but excludes naturally downed woody material. Non-merchantable timber: This term refers to stem material left on site that does not meet the specification of any of the forest products being produced in the forest. For most operations this means it is smaller than a pulp log, with a small end diameter of 10cm (but can range from 8 to 15 cm depending on region), and a minimum length of 2.5m (but this can range from 2 to 3.5 m depending on region).

A **high stump,** also called artificial snag, is created by cutting the stem of a tree at a height of 2–4 metres and leaving the stump standing where it is. The stumps are left to provide deadwood for species dependent on it.

Large Woody Debris (LWD) / Coarse Woody Debris (CWD): Is also a well-established term and by common definition refers to logs, sticks, branches, and other wood that is larger than 10cm in diameter. It is frequently used when discussing the need for LWD in creating adequate waterway habitat, or for identifying a risk when an over-abundance poses a dam risk. Small (or Fine) Woody Debris (SWD): is a less used term, but simply refers to 'woody debris' that is smaller than 10cm in diameter, but larger than 1cm. Material less than 1cm is referred to as 'litterfall'.

Long Resident Logs (LRL)

Pine that has been harvested but not recently. They may still have sharp cut ends, but a weathering rind will be present, or the ends will be uniformly weathered. In other instances, the cut ends will have been rounded off and can form cone shapes Waratah marks may still be present. The trunk may look relatively fresh or may be grey.

Slash: (also called 'Brush') is defined as coarse and fine woody debris generated during logging operations, but it also includes material generated by wind, snow or other natural forest disturbances. In Europe slash usually just refers to the branches that are delimbed from the felled trees. For example, 'slash' is used in extraction corridors to reduce soil disturbance and compaction. Off-cuts: a specific type of slash whereby a segment of a stem that has a defect (i.e. large knots), and these will typically be larger than 10cm in length. NZ operations generate a large volume of off-cuts (1) radiata pine trees have many defects that are not preferred in our log grades (2).

Sloven: a specific type of material whereby a log (or stem) is trimmed to create a flush end. These thin segments will typically around 10cm in length. NZ operations tend to generate a large number of slovens as most stems will be cut flush at the butt end, and again either side of the stem break. Sometime also incorrectly called a 'biscuit' because of its shape, but that term technically refers to a small flat piece of wood used to join two larger pieces of wood together.

Woody Debris: This term is widely used to refer to material left behind after a harvesting operation. However, it is not necessarily a preferred term as the definition of debris is "scattered pieces of rubbish or remains" and as such has an immediate negative connotation. The woody material being left behind is neither rubbish nor evenly scattered. Especially post-harvest on steep terrain the material is typically concentrated either at the landing (/processing area) or swept into depressions along the slope.

13. ADDITIONAL LINKS AND EVIDENCE

These links contain some expert evidence that may be useful for sustainable land use mahi and ministerial inquiry.

- Environment & Planning Committee 9 March 2023 Agenda (marlborough.govt.nz)
- EDS Legal proceedings – NES-PF Item 11 - 09032023 - EDS Legal Proceedins - NES-PF - Attachments 1-11 (marlborough.govt.nz)
- Cyclone Bola Inquiry https://pce.parliament.nz/media/lr2n4g4x/inquiry-into-flood-mitigation-measures-following-cyclone-bola-december-1988-small.pdf

Appendices

Appendix 1 Events with significant forestry impacts in Tairāwhiti 2012 - 2023

Date	Event	Impacts
20 March 2012	Wharerata – Whareongaonga Forest	Destroyed part of the railway line State Highway 2 Culverts damaged Forestry slash impacts on Maraetaha River  
Easter 2014	Wharerata – Whareongaonga Forest	Forestry slash impacts Maraetaha River Blockage of Maraetaha River bridge 
	Waimata Catchment – Mangarara and Whakaroa Forests	Forestry slash impacts Waimatā River, Waikanae Beach Impacts on farmland in Waimatā River headwaters Significant sedimentation event Turanganui Estuary

		
23 May 2015	Wharerata - South	Forestry slash at all SH2 bridges Maraetaha River Orongo Beach covered in slash Impacts on Maraetaha River, Kopuawhara Stream, Nuhaka River Kopuawhara and Nuhaka Flood Control Scheme blocked by slash and flooding occurred Coastal impacts widespread as slash moved north depositing at Kaiti Beach, Wainui and Makorori and presenting a danger to coastal shipping for several months  
September 2015	Waimatā Catchment – Wakaroa Forest	Waimatā River impacts, Mangataikehu Stream affected. Downstream farmland fences destroyed, riparian sediment loaded and large amounts of slash deposits. Waikanae Beach covered in slash Significant slash around Gladstone Road Bridge Gisborne City Significant sedimentation event Turanganui Estuary

		 
12th April 2017	Cyclone Cook (credit Cave, Davies and Langford 2017)	 
3-4 June 2018	Queen's Birthday Storm	Mangatokerau overwhelmed by slash, evacuations, houses and buildings destroyed by slash. Wigan Bridge jammed. Tolaga Bay beach and farmland covered in slash and sediment Massive sedimentation of Tolaga Bay and woody debris across the bay bottom

		  
11-12 June 2018	Second June Storm	Waimatō River extensive slash damage Waimatō Valley Road culvert blocked, damage to road Mangataikehu Stream affected. Downstream farmland fences destroyed, farmland covered in slash and sediment loaded and large amounts of slash deposits. Waihora River extensive slash damage Mangapoike River extensive slash damage Waikanae Beach slash Significant slash around Gladstone Road Bridge Gisborne City Significant sedimentation event Turanganui Estuary Waiapu Mouth/Tikapa Beach affected by slash
June and July 2020	Winter storms	Tolaga Bay, Tokomaru Bay and Waipiro Bay Beaches covered by slash

		Waiapu Mouth/Tikapa Beach affected by slash 
20 May 2021	Large Storm	Uawa – Tolaga Bay remobilisation of material and substantial deposition across Tolaga Bay Beach and Uawa River Mouth
March 2022	Cyclone Hale	Waimatā River extensive slash damage Mangataikehu Stream affected. Downstream farmland fences destroyed, farmland covered in slash and sediment loaded and large amounts of slash deposits. Waikanae Beach slash Significant slash around Gladstone Road Bridge Gisborne City Significant sedimentation event Turanganui Estuary Waiapu Mouth/Tikapa Beach affected by slash 
January 2023	Cyclone Hale	Mangatokerau overwhelmed by slash, evacuations, buildings destroyed by slash. Waimatā River extensive slash damage Mangataikehu Stream affected. Downstream farmland fences destroyed, farmland covered in slash and sediment loaded and large amounts of slash deposits. Waikanae Beach slash. Crayfish and pāua found after Cyclone Hale, at Tikapa credit NZ Herald. 

		 Significant slash around Gladstone Road Bridge Gisborne City Significant sedimentation event Turanganui Estuary Waiapu Ngutuawa significantly affected Tikapa Beach
February 2023	Cyclone Gabrielle	Region-wide significant devastation. A step change in land damage from the previous events – older trees (12+ years) have also failed on steep slopes. Numerous rivers including the Mangatokerau, Mangaheia and Hikuwai at Tolaga Bay overwhelmed by logs and evacuations.  **Tolaga Bay** Massive slash metres high on Tolaga Bay beach and on beaches further north (drone survey done, extent of damage not yet known as these areas have not been able to be surveyed as they are cut off).  **Tributary of Waimata River**

		Waimatā River extensive slash damage, damage to Waimatā Valley Road and Riverside Roads and widespread damage to farms in the catchment – loss of fences, flood gates, farm buildings. Massive sediment losses from forests into upper catchment farms. Failure of older trees on steeplands. Massive deposits of slash across Poverty Bay beaches Significant slash around Gladstone Road Bridge Gisborne City Te Arai River extensive slash damage. Loss of Gisborne water suppy – while land failure has been the main cause, forestry slash has hindered repair efforts.  **Hikuwai Bridge No1** Multiple bridges destroyed by slash including the Hikuwai and Wigan Bridges cutting off the East Coast from Gisborne.
February – March 2023	Continued heavy rain events	Impacts of Cyclone Gabrielle exacerbated. Difficulty in clean up compounded by the huge volumes of forestry wastes and also whole tree failures.

Appendix 2 Wood debris from 2023 events

Tolaga Bay Wharf logs in the coastal environment have accelerated need for the wharf to be replaced/renewed.	 
Woody Debris jammed against Wigan Bridge on the Mangaheia River, Upper Tauwhareparae *Road.*	

Waimatā River, around the 10km mark of Waimatā Valley Road. A large build-up of primarily pine debris is on the true left of the river.	
Waimatā River, east of the 10km mark of the Waimatā Valley Road. Pine debris has been caught in kānuka and another *Pinus radiata* plantation on the true left bank of the river.	
Watson's Bridge, Linburn Road over the Waimatā River. A mix of pine, one macrocarpa and silver poplar has collected beneath the bridge.	

Waimiro Station, Waimatā Valley. A paddock on the true left of the river has been completely covered in a thick layer of silt with identifiable parts of pine scattered throughout.	
Waimiro Station, Waimatā Valley, more pine forest waste has built up on the true left riverbank.	
Waimatā Valley 18km culvert. Mainly on true left bank of main river channel, piles are on both banks are c.3 metres in height.	

Example of trees that fell in the storm or flooding typically remain in place due to their root structures.	

Appendix 3 Council approaches to managing plantation forestry impacts

Council	Provision where more stringent than NES-PF	Further regulation planned?
Northland Regional Council	Where forestry could impact on Pouto Lakes from harvest and afforestation where it could impact on water levels in lakes	-
Bay of Plenty Regional Council		Yes – actively investigating options re sediment loss as part of NSPFM implementation
Waikato Regional Council	Where forestry could impact on geothermal resources	-
Marlborough District Council	Afforestation in sites that are identified as flow sensitive, within 10m of a Significant Wetland, within the Limestone Coastline Outstanding Natural Landscape and Wairau Dry Hills Amenity Landscape or in proximity to a water supply abstraction point. Harvesting within 8m of a Significant Wetland, or in proximity to a water supply abstraction point. Operation of wheeled or tracked machinery within 8m of a Significant Wetland. Harvesting must not cause any conspicuous change of colour or natural clarity of the water in a Significant Wetland or the coastal marine area. Comprehensive provisions for woodlot planting and harvesting	-
Tasman	Forestry activities within St Arnaud and Takaka Hill Landscape Priority Areas. 50m setback from the coastal environment for forestry activity including afforestation and replanting. Restrictions on afforestation and replanting within the Groundwater Recharge Protection Area and Surface Water Yield Protection Area. Earthworks require resource consent within 200m of the coastal marine area where they are >1000m2/year or visible from any publicly accessible viewing point or where they will change the height of ridges or cliffs identified in the planning maps. Soil disturbance and removal of vegetation within the Separation Point Granite soils	Yes – currently reviewing adequacy of protections following significant storms and impacts on the coastal marine area
Canterbury Regional Council	Discharge limits for sediment	
Otago		Yes- in relation to sediment

Regional Council		discharges, agrichemical use, disturbance of beds and rivers, flow regimes and soil quality

Appendix 4 : ***Summary of consent related prosecutions from the events of 2018***

Forest	Defendant	Fine imposed	Reparation imposed	Comments	Date of guilty plea / sentencing
Te Marunga	Aratu Forests Ltd	$229,500	$125,000	- 83 collapsed skid sites - Damage outside forest - Tolaga Bay catchment	13 June 2019 / 17 February 2020
Wakaroa	Aratu Forests Ltd	$150,000	$0	- 8 collapsed skid sites - Damage outside forest	13 June 2019 / 17 February 2020
Waituna	Juken NZ Ltd	$152,000	$0	- 11 collapsed skid sites - No damage outside of forest	22 August 2019 / 22 November 2019
Makiri	DNS Forest Products 2009 Ltd	$124,700	$6,500	- 3 collapsed skid sites - No damage outside forest	7 February 2020 / 15 July 2020
Paroa	PF Olsen Ltd	$198,000	$0	- 7 collapsed skid sites and one road collapse - Damage outside forest - Tolaga Bay catchment	17 July 2020 / 14 September 2020
Uawa	Ernslaw One Ltd & Timbergrow Ltd	$225,000	$130,000	- 10 collapsed skids sites, multiple road collapses - Damage outside forest	28 January 2022 / 9 December 2022

				- Tolaga Bay catchment - Disputed facts hearing (4 days)	