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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.

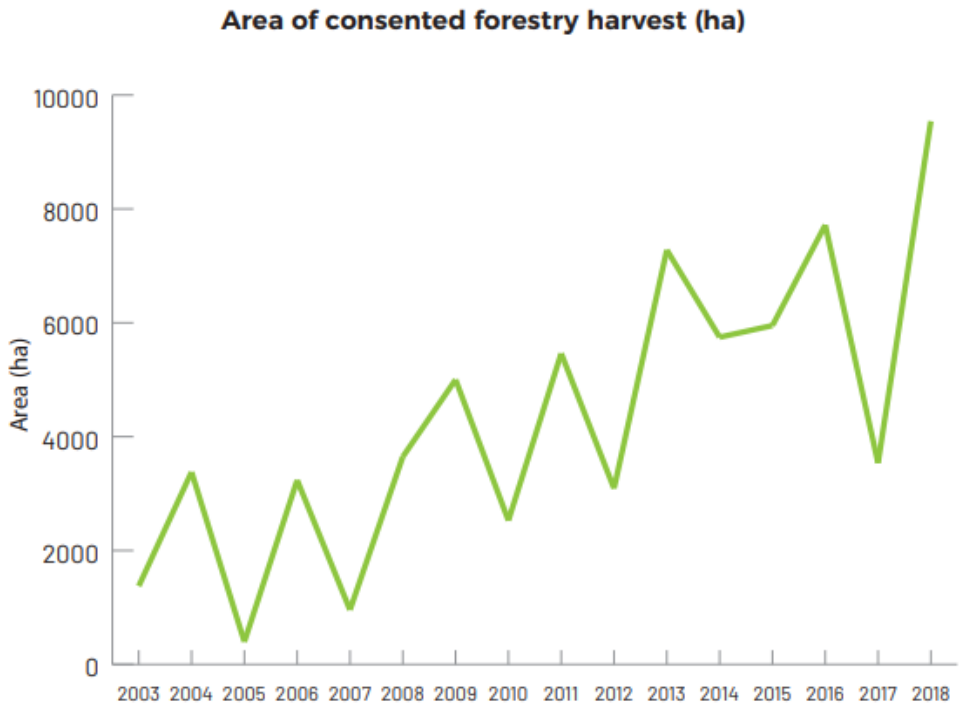


Figure 1 Forestry harvest by year. Forestry harvest planning tends to be on a two-year cycle, with a busy year followed by a less busy year. This trend can be generally observed since 2003, with a step change increase in harvest areas from 2009.

[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)

[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 "e*xclusion, 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 Accords**24**. 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] Routes through the Forests Act have been used recently with the Legal Harvest Assurance Bill, 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

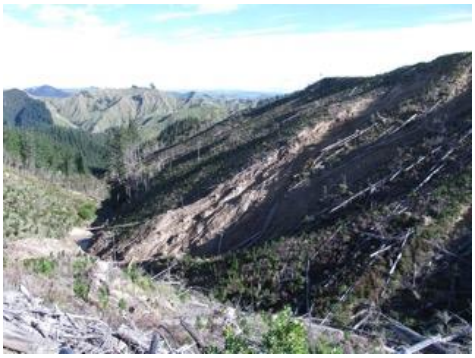
These links contain some expert evidence that may be useful for sustainable land use mahi and ministerial inquiry.

- 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	Waimatā River extensive slash damage Waimatā 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)	