Environment Committee Meeting

9 March 2023

This Report relates to Item 1**0** in the Agenda

“EDS Legal proceedings – NES-PF”

Attachment 1

Notice of Application for Declarations by EDS

BEFORE THE ENVIRONMENT COURT **ENV-2023-CHC-**
AT CHRISTCHURCH

TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

NOTICE OF APPLICATION FOR DECLARATIONS BY ENVIRONMENTAL DEFENCE SOCIETY INC

Dated 20 January 2023

Solicitor
Douglas Allan / Cordelia Woodhouse
Ellis Gould
Level 31, Vero Centre
48 Shortland Street
AUCKLAND 1142
cwoodhouse@ellisgould.co.nz

Counsel
Rob Enright
Magdalene Chambers
Wānaka & Auckland
021 276 5787
rob@publiclaw9.com

TO: Marlborough District Council
Forestry Owners Association
Minister for Forests
Minster for the Environment
Iwi Authorities identified by the Regional Policy Statement as tangata whenua in the Marlborough region: Ngāti Apa, Ngāti Kōata, Ngāti Kuia, Ngāti Rārua, Ngāti Toa, Ngāi Tahu, Rangitāne and Te Ātiawa

1 Environmental Defence Society Inc ("EDS") gives notice that it applied for the following declarations from the Environment Court on 20 January 2023:

Declaration 1:

Sub-parts 3 and 6 of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 ("NES-PF") breach section 43A(3) of the RMA by permitting harvesting (and related earthworks) in the orange zones of Marlborough Sounds.

Declaration 2:

Sub-parts 3 and 6 of the NES-PF are inconsistent with the statutory purpose in Part 2 RMA by permitting harvesting (and related earthworks activities) in the orange zones of the Marlborough Sounds.

Declaration 3:

Classification of harvesting (and related earthworks activities) as permitted activities in the orange zones of Marlborough Sounds in reliance on the erosion susceptibility classification (ESC) breaches section 43A(3) of the RMA or the statutory purpose because:

(1) The ESC is based on inaccurate or unreliable data;
(2) The ESC adopts an unlawful and deeming approach to sediment risk that does not address site specific effects;
(3) The ESC methodology is otherwise fatally flawed.

Advice note: these declarations rely on defined terms in the NES-PF for "erosion susceptibility classification", "harvesting", "earthworks" and "orange zone".

2 If you wish to be heard at the hearing to determine this matter, you should notify the Environment Court registrar within 15 working days after the date the application was made.

3 If you do not notify the Registrar of your wish to be heard, the case may proceed without further notice to you.

4 The following documents are attached to the Application and are available on request:

4.1 Affidavit of Mark Bloomberg dated 20 January 2023

4.2 Affidavit of Sean Jeffery Handley dated 20 January 2023

4.3 Affidavit of Robert James Davidson dated 20 January 2023

4.4 Affidavit of James Whitney Griffiths dated 20 January 2023

4.5 Affidavit of Gary Vernon Taylor dated 20 January 2023

4.6 First memorandum in relation to declarations on behalf of EDS dated 20 January

5 The Application and the documents in paragraph 4 above are attached to this notice.

DATED this 20th day of January 2023

R B Enright/ C S S Woodhouse
Counsel for Environmental Defence Society Inc

Address for service of Applicant:

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Advice
If you have any questions about this application, contact the Environment Court in Auckland, Wellington, or Christchurch.

APPENDIX A – PERSONS TO BE SERVED WITH A COPY OF THE ENVIRONMENTAL DEFENCE SOCIETY'S APPLICATION FOR DECLARATIONS

	Name	Service details
1	Marlborough District Council	**Marlborough District Council** 15 Seymour Street Blenheim 7240
1	Forest Owners Association	**Forest Owners Association** 9/93 The Terrace Wellington Central Wellington 6011
2	Minister for the Environment	**Minister for the Environment** Hon David Parker Minister for the Environment Parliament Buildings Wellington 6160
3	Minister for Forests	**Minister for Forests** Hon Stuart Nash Minister for Forestry Parliament Buildings Wellington 6160
4	Ngāti Apa	**Ngāti Apa ki te Rā Tō** 78 Seymour Street Blenheim 7201
5	Ngāti Kōata	**Ngāti Kōata** c/-o Ngāti Kōata Trust 137 Vickerman Street Port Nelson Nelson 7010
6	Ngāti Kuia	**Ngāti Kuia** Blenheim office 19 Kinross Street Blenheim 7240
7	Ngāti Rārua	**Ngāti Rārua** c/-o Ngāti Rārua Iwi Trust 15 Kinross Street Blenheim, 7201
8	Ngāti Toa	**Ngāti Toa** 28 Grove Road Blenheim, 7201
9	Ngāi Tahu	**Ngāi Tahu** Te Whare o Te Waipounamu

		15 Show Place Addington Christchurch 8024
10	Rangitāne	**Rangitāne** c/-o Te Runanga a Rangitane o Wairau Trust Rangitāne House Post Office Tower Level 5/2 Main Street Blenheim Central Blenheim 7201
11	Te Ātiawa	**Te Ātiawa** c/-o Te Ātiawa Trust Beach Road Waikawa Marina Waikawa Picton, 7220

Attachment 2

Application for Declarations by EDS

BEFORE THE ENVIRONMENT COURT **ENV-2023-CHC-**
AT CHRISTCHURCH

TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

APPLICATION FOR DECLARATIONS BY ENVIRONMENTAL DEFENCE SOCIETY INC (EDS)

Dated 20 January 2023

Solicitor
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Ellis Gould
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AUCKLAND 1142
cwoodhouse@ellisgould.co.nz

Counsel
Rob Enright
Magdalene Chambers
Wānaka & Auckland
021 276 5787
rob@publiclaw9.com

TO: The Registrar
Environment Court
CHRISTCHURCH

1 Environmental Defence Society Incorporated ("EDS") applies for the following declarations pursuant to sections 310(h) of the Resource Management Act 1991 (RMA):

Declaration 1:

Sub-parts 3 and 6 of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 ("NES-PF") breach section 43A(3) of the RMA by permitting harvesting (and related earthworks) in the orange zones of Marlborough Sounds.

Declaration 2:

Sub-parts 3 and 6 of the NES-PF are inconsistent with the statutory purpose in Part 2 RMA by permitting harvesting (and related earthworks activities) in the orange zones of the Marlborough Sounds.

Declaration 3:

Classification of harvesting (and related earthworks activities) as permitted activities in the orange zones of Marlborough Sounds in reliance on the erosion susceptibility classification (ESC) breaches section 43A(3) of the RMA or the statutory purpose because:

(1) The ESC is based on inaccurate or unreliable data;
(2) The ESC adopts an unlawful and deeming approach to sediment risk that does not address site specific effects;
(3) The ESC methodology is otherwise fatally flawed.

Advice note: these declarations rely on defined terms in the NES-PF for "erosion susceptibility classification", "harvesting", "earthworks" and "orange zone".

Grounds for the Application are:

2 This Application is made on the following grounds:

The ESC incorrectly assesses erosion risk

2.1 The Erosion Susceptibility Classification ("ESC") is the initial screening step in the management of erosion risk of plantation forestry activities. Based on the risk of erosion, the ESC classifies land as one of four zones – green (low risk of erosion), yellow (moderate risk of erosion), orange (high risk of erosion) or red (very high risk of erosion).

2.2 Erosion risk is assessed at a scale of 1:50,000. EDS submits that at this scale, it cannot reliably discriminate areas of high landslide occurrence from areas of low landslide occurrence as the data layers may be too coarse to adequately represent local scale (1:10,000) variations. A finer scale (1:10,000) assessment is only mandated through the resource consent process, rather than being the information basis for determining whether consent should be required in the first place.

2.3 As the risk profile ascribed by the ESC determines the stringency of controls applied to forestry activities under the NESPF, including the availability of permitted activity status, this is not appropriate. Finer-scale (1:10,000) ESC mapping and erosion hazard mapping prior to determining activity status is required to ensure the risk of adverse effects from forestry activities are adequately understood and controlled.

2.4 The ESC relies on factual and legal fictions. The ESC "deems" that harvesting (and related earthworks) activities can take place in high erosion risk land in the Marlborough Sounds (the orange zones), without assessing the actual effects caused by those activities, and assigns permitted status to activities that should trigger a consent requirement under section 43A(3) of the RMA and the statutory purpose.

The NESPF permits significant adverse effects on the environment

2.5 In Marlborough, much of the erosion-prone hill country which is, by definition, susceptible to landslides has been identified as orange under the ESC. The NES-PF provides that, on orange (high erosion risk) ESC land, earthworks and harvesting can occur as a permitted activity subject to conditions.

2.6 These activities can result in erosion and sediment generation effects. When undertaken on more erodible landscapes, such as the hill country in Marlborough, the likelihood of these effects is higher.

2.7 Under section 43A(3) of the RMA, a national environmental standard cannot permit or allow an activity without resource consent if that activity has a "significant adverse effect on the environment".

2.8 The evidence supporting this Application demonstrates the significant adverse effects on marine environments of sedimentation from forestry in upstream catchments in the Marlborough Sounds.

2.9 EDS considers that there is a sufficient causal nexus between the sediment generated by permitted activities in the NESPF and the resulting significant adverse effects on marine ecology.

Other grounds

3 Other grounds are set out in the Memorandum of Counsel and the supporting affidavits filed herein.

Relief sought

4 In the event that the Court answers EDS's declaration questions in the affirmative, EDS reserves the ability to apply for further or other relief, including further declarations or action in a higher court.

Other matters

5 EDS considers that the declarations are necessary to ensure that the national framework for managing forestry activities does not permit significant adverse effects on the coastal waters of the Marlborough Sounds, and is consistent with the statutory purpose and section 43A(3) of the RMA.

6 Further grounds contained in the following documents:

a. Affidavit of Mark Bloomberg dated 19 January 2023

b. Affidavit of Sean Jeffery Handley dated 19 January 2023

c. Affidavit of Robert James Davidson dated 19 January 2023

d. Affidavit of James Whitney Griffiths dated 19 January 2023

e. Affidavit of Gary Vernon Taylor dated 19 January 2023

f. First memorandum in relation to declarations on behalf of EDS dated 20 January

7 With respect to service of this Application, EDS respectfully seeks directions and waivers (as necessary) as to:

a. Electronic service of the Application and supporting documents on the Respondent, Forest Owners Association, Minister for Forests, Minister for the Environment and Iwi Authorities identified in Appendix A. EDS considers those persons are directly affected by the Application.

DATED this 20th day of January 2023

R B Enright / C S S Woodhouse
Counsel for Environmental Defence Society Inc

Address for service of Applicant:

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Advice
If you have any questions about this application, contact the Environment Court in Auckland, Wellington, or Christchurch.

APPENDIX A – PERSONS TO BE SERVED WITH A COPY OF THE ENVIRONMENTAL DEFENCE SOCIETY'S APPLICATION FOR DECLARATIONS

	Name	Service details
1	Marlborough District Council	**Marlborough District Council** 15 Seymour Street Blenheim 7240
1	Forest Owners Association	**Forest Owners Association** 9/93 The Terrace Wellington Central Wellington 6011
2	Minister for the Environment	**Minister for the Environment** Hon David Parker Minister for the Environment Parliament Buildings Wellington 6160
3	Minister for Forests	**Minister for Forests** Hon Stuart Nash Minister for Forestry Parliament Buildings Wellington 6160
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11	Te Ātiawa	**Te Ātiawa** c/-o Te Ātiawa Trust Beach Road Waikawa Marina Waikawa Picton, 7220

Attachment 3

First Memorandum in relation to Declarations on behalf of EDS

BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH

ENV-2023-CHC-

TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

FIRST MEMORANDUM IN RELATION TO DECLARATIONS ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED (EDS)

Dated 20 January 2023

Solicitor
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cwoodhouse@ellisgould.co.nz

Counsel
Rob Enright
Magdalene Chambers
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MAY IT PLEASE THE COURT

Introduction

1. Anthropocentric causes of marine sedimentation are a major source of marine pollution, damaging marine biodiversity, reducing water quality, and exacerbating climate change effects.

2. A major cause of marine sediment in the Marlborough Sounds are harvesting activities, and related earthworks, undertaken by plantation forestry operations on erosion prone land. It is not the only source, but is a substantial cause.[1]

3. EDS asserts that sediment effects require assessment through a resource consent regime. This would ensure that avoidable effects are avoided; or otherwise addressed through relevant consent conditions, and the effects management hierarchy.

4. Forestry activities, including harvesting, are managed under a National Standards framework (the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017) (the NES-PF), as well as (to a more limited extent) regional and district plans.[2]

5. The NES-PF introduces permitted, controlled, and restricted discretionary consent requirements for defined forestry activities on an NZ-wide basis. The NES-PF permits harvesting on low, moderate, and high erosion risk areas; meaning that no resource consent is required.[3] Identification of risk zones, through use of a tool called the Erosion Susceptibility Criteria (ESC), is fundamental to the NES-PF. The ESC classifies land as green, yellow, orange and red zones.

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[1] Refer affidavit evidence filed herein.

[2] Clause 6 of the NES-PF; Regional and district rules may be more stringent when giving effect to the National Policy Statement for Freshwater Management 2020 (NPS-FM 2020), parts of the New Zealand Coastal Policy Statement 2010 (NZCPS), defined matters of national importance, or management of unique and sensitive environments.

[3] The Standard includes a permitted threshold for small scale plantation forestry in the red (very high risk) erosion zone. No declarations are sought in relation to red zone land.

6. The focus of these proceedings is on harvesting (and associated earthworks) in high erosion risk areas in the Marlborough Sounds (the **orange zones**). This focus is explained in the affidavit evidence filed herein. In short, it is because the nationally and regionally significant coastal values of the aquatic environment of the Marlborough Sounds are suffering significant adverse effects from these activities. Deemed permitted status under the NES-PF means these effects are not being managed.

7. The permissive regime of the NES-PF is a breach of section 43A(3) of the RMA (which requires that resource consent is obtained where significant adverse effects result from an activity controlled by any National Environmental Standard).

8. By enabling significant adverse effects, without requiring resource consent, the NES-PF is also inconsistent with the statutory purpose in Part 2 RMA, which requires (*inter alia*) that adverse effects are avoided, remedied, or mitigated, and that significant indigenous biodiversity (marine flora and fauna) are protected in the coastal environment. This purpose can only be achieved if significant adverse effects of harvesting (and related earthworks) are avoided, or those effects are managed through a resource consent process.

9. This forms the context to EDS's application for declarations.

Context: the NES-PF's approach to assessing erosion risk and determining resource consent

10. The NES-PF apply to plantation forestry greater than 1 ha that has been established for commercial purposes and will be harvested or replanted. It regulates several plantation forestry activities. Clause 5 of the NES-PF confirms that it applies (*inter alia*) to harvesting[4] and earthworks[5] associated with plantation forestry. Sub-parts

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[4] **harvesting**—
- a) means felling trees, extracting trees, thinning tree stems and extraction for sale or use (production thinning), processing trees into logs, or loading logs onto trucks for delivery to processing plants; but
- b) does not include—
  - i) milling activities or processing of timber; or
  - ii) clearance of vegetation that is not plantation forest trees

[5] **earthworks**—

3 and 6 identify permitted standards for harvesting and earthworks activities, including (*inter alia*) Clause 65, relevant to regional council functions, that sediment originating from harvesting must not give rise to any significant adverse effect on aquatic life.

11. The Regulations use the ESC[6] to determine whether resource consent is required to undertake plantation forestry activities. The ESC assesses the erosion risk of land based on its environmental characteristics and classifies land as one of four zones – green (low risk), yellow (moderate risk), orange (high risk) or red (very high risk). The ascribed risk profile is used as a basis for applying appropriate environmental controls on the use of that land. Thus the ESC is critical to the level of regulation applied to forestry activities under the Regulations.

12. The Regulations impose fewer controls on activities conducted on lower risk (green and yellow) land and high risk (orange) land than very high risk (red) land. Generally speaking, only activities on red ESC land require resource consent. Most other activities on orange, yellow and green ESC land are permitted, *at any scale*, subject to conditions. For example, the Regulations permit:
    a) Earthworks in the green and yellow ESC zones, earthworks in the orange zone with a land slope of less than 25 degrees; earthworks in an orange ESC zone with a land slope of greater than 25 degrees but which complies with thresholds; and earthworks in the red ESC zone that complies with thresholds.
    b) Harvesting in the green, yellow and orange ESC zones, and in the red ESC zone if it is less than 2ha in any 3-month period.

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a) means disturbance of the surface of the land by the movement, deposition, or removal of earth (or any other matter constituting the land, such as soil, clay, sand, or rock) in relation to plantation forestry; and
b) includes the construction of forestry roads, forestry tracks, landings and river crossing approaches, cut and fill operations, maintenance and upgrade of existing earthworks, and forestry road widening and realignment; but
c) does not include soil disturbance by machinery passes, forestry quarrying, or mechanical land preparation

[6] The ESC is incorporated by reference in the Regulations, so it has the same legal effect as the Regulations, see RMA, Section (1)(3) and Schedule 1AA

Issues with the ESC

13. Issues associated with using the ESC in the Regulations have been raised since first proposed. The Ministry for Primary Industries (**MPI**), via its Forestry Service Te Uru Rākau, acknowledges problems with the ESC in various guidance documents and reporting on the ESC. The Regulations' use of the ESC to determine resource consent requirements is inappropriate because:
    a) The ESC does not accurately map erosion risk at the operational scale; and
    b) The ESC uses outdated data.

Inaccurate mapping

14. The ESC was not designed to be used as a tool for planning forestry activities at the local level as it does not accurately assess erosion risk at that scale. In its 2021 Year One Review of the Regulations, Te Uru Rākau states that the ESC is being applied at a scale that is not accurate enough for site-specific assessments.[7]

15. The ESC uses a 1:50,000 scale that was originally intended to be used as a screening tool for operational planning that required further interpretation before being applied at a larger (more localised) scale. However, the Regulations currently allow the ESC tool to be used at a 1:50,000 scale for management planning (i.e., ESC land is colour coded at this scale).

16. The Regulations require that earthworks management plans and harvest plans include maps at "a scale not less than 1:10,000".[8] However, provision of these plans is only required in accordance with permitted activity conditions or as a matter of control/discretion for controlled or restricted discretionary activities. Thus the finer scale assessment is not being used as the information basis for determining what consent should be required in the first place. That is determined by the ESC's risk classification of the land in question.

[7] Report on the Year One Review of the National Environmental Standards for Plantation Forestry, 2021, Te Uru Rākau, p 56-57.
[8] NESPF, Schedule 3(2).

17. Problems associated with the coarse spatial resolution of the ESC are detailed in Mr Bloomberg's affidavit. It creates problems for foresters and councils because it provides a misleading picture of risk, and does not appropriately assign resource consent to activities.

Use of outdated data

18. Te Uru Rākau's Year One Review also states that some regions have questioned the accuracy of the ESC. Data underlying the ESC comes from the New Zealand Land Resource Inventory and some of that data has not been updated since the 1970s and 1980s. Te Uru Rākau states that it is likely that in some cases local knowledge and evidence do provide more accurate assessments of erosion risk.[9]

Summary

19. As stated by Mr Bloomberg, finer-scale (1:10,000) ESC mapping and erosion and landslide hazard mapping is required to ensure the risk of adverse effects from forestry activities are adequately understood and controlled.[10]

20. For the reasons listed above, the ESC deems areas of risk without undertaking a site or location based assessment of risk. This deeming approach is unlawful or invalid because it does not assess the relevant receiving environment and the risk of significant adverse effects from harvesting in high erosion risk areas. It is otherwise unreasonable for use in the NES-PF as a method of assessing erosion and landslide risk and determining resource consent requirements. EDS seeks a declaration to this effect.

Overview of declarations

21. The proposed wording for declarations are set out in the Application and Notice of Application. Because the NES-PF apply on an industry-wide basis, the declarations may have wider application.

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[9] Report on the Year One Review of the National Environmental Standards for Plantation Forestry, 2021, Te Uru Rākau, p 56-57.
[10] Refer Bloomberg affidavit.

22. The NES-PF includes a range of relevant definitions, relied on for the purposes of the declarations sought. These include *earthworks, erosion susceptibility classification, erosion risk zones (green, yellow, orange, red), harvesting, plantation forestry* and *sediment*.

23. The declarations assert that:

Declaration 1:

Sub-parts 3 and 6 of the NES-PF breach section 43A(3) of the RMA by permitting harvesting (and related earthworks) in the orange zones of Marlborough Sounds.

Declaration 2:

Sub-parts 3 and 6 of the NES-PF are inconsistent with the statutory purpose in Part 2 RMA by permitting harvesting (and related earthworks activities) in the orange zones of the Marlborough Sounds.

Declaration 3:

Classification of harvesting (and related earthworks activities) as permitted activities in the orange zones of Marlborough Sounds in reliance on the erosion susceptibility classification (ESC) breaches section 43A(3) of the RMA or the statutory purpose because:

(1) The ESC is based on inaccurate or unreliable data;
(2) The ESC adopts an unlawful and deeming approach to sediment risk that does not address site specific effects;
(3) The ESC methodology is otherwise fatally flawed.

24. Relevant background is set out in the affidavits filed herein. Together, they demonstrate that:

a) The NES-PF determines resource consent requirements for harvesting and associated earthworks plantation forestry activities.
b) Generally, harvesting and associated earthworks are permitted on land classified as 'high' erosion risk.
c) On highly erodible land, these activities result in sediment loss. This is exacerbated by high rainfall events.

d) The sediment generated from permitted earthworks and harvesting causes significant adverse effects on the marine environment in the Marlborough Sounds.

e) Permitted activity status enables, and does not avoid, these significant adverse effects.

f) The ESC is grossly unreliable for site-specific locations and cannot (by itself) be used to determine resource consent status under the NES-PF. The ESC deems a level of erosion risk that is inaccurate and does not reflect the actual risk or the actual effects of harvesting activity.

Case study: Marlborough region

Permitted forestry activities in the Marlborough region

25. In the Marlborough region, ~50% of the area used for plantation forestry activities is on orange (high risk) ESC land. This is comparatively higher than other ESC land (green, yellow and, in particular, red ESC land which comprises ~0.18% of the area used for plantation forestry activities).[11]

26. Consequentially, as long as certain permitted activity conditions are met, the majority of earthworks and harvesting within the Marlborough region does not require resource consent under the Regulations at any scale. This plays out in the number of consents actually issued for plantation forestry activities undertaken in the Marlborough region. Since the NES-PF came into force, of the plantation forestry activities notified to Marlborough District Council, approximately 84% were permitted.[12]

27. Dr Handley's affidavit demonstrates that plantation forestry as a significant contributor to sediment deposition in the Sounds. Topsoil from harvested pine contributes 46 to 147 x more sediment than native forest. Further, removal of vegetation on harvested pine areas exposes large areas of subsoils to erosion by rainfall and surface runoff and increase the risk of landslides due to progressive

[11] Refer Bloomberg affidavit.
[12] Refer Taylor affidavit at [14] – [16].

loss of root reinforcement of soils. This soil erosion risk persists for several years after these harvested areas are replanted.

28. The Marlborough Sounds marine environment is greatly influenced by sediment arriving from surrounding catchments.[13] In the Sounds' marine environment, the effects of sedimentation appear most pronounced in areas where streams and rivers deliver sediment from adjacent recently cleared catchments. This is particularly so for steep catchments and catchments with highly erodible soils.[14] Sedimentation is exacerbated by rainfall events which result in large scale sediment transport.[15]

29. Intertidal and subtidal areas in the Marlborough Sounds support species, habitats and communities with high biological importance. Many are regarded as biologically important at a regional, national and, in some cases, international level.[16] Increased sedimentation is resulting in the loss of these important biological values and is having significant adverse effect on the marine environment.[17]

Directions for service

30. Pursuant to section 312 of the RMA an applicant for a declaration is required to serve notice of the application in the prescribed form on every person directly affected.

31. On a preliminary basis, EDS considers that the following persons are directly affected:
    a) The Respondent
    b) Forest Owners Association
    c) Minister of Forestry
    d) Minister for the Environment

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[13] Davidson affidavit at [15]
[14] Davidson affidavit at [54]
[15] Davidson affidavit at [15]
[16] Davidson affidavit at [17]
[17] Davidson affidavit at [53]

e) Iwi Authorities identified by the Regional Policy Statement as tangata whenua in the Marlborough region: Ngāti Apa, Ngāti Kōata, Ngāti Kuia, Ngāti Rārua, Ngāti Toa, Ngāi Tahu, Rangitāne and Te Ātiawa

32. EDS anticipates that these declarations may attract public interest beyond those parties listed above but EDS does not consider other persons to be "directly affected" such that personal service of the application is required pursuant to sections 312 and 320 of the RMA. Any other person who may be interested in these declarations may become a party to the proceedings if they meet the requirements in section 274 of the RMA.

33. EDS requests the following directions:

a) That the parties listed in [31] above be electronically served with the Notice of Application and supporting documents;
b) That the parties served with these declarations advise the Court within 5 working days of service as to whether they intend to participate, by filing a s274 Notice or (in the case of the Respondent) a Notice of Opposition or s274 Notice;
c) That, following (b), a judicial teleconference be convened; and
d) Subject to (b) and (c), the Registrar is to liaise with parties and allocate a mediation date for these proceedings.

34. EDS notes that, in the event the declarations are granted, this may prompt further declarations or action in a higher court. Alternatively, the scope of the current review of the NESPF could be widened to address this issue. Notwithstanding this, it considers the Environment Court the appropriate specialist Court to determine the issues identified by the Declarations.

DATED this 20th day of January 2023

R B Enright/ C S S Woodhouse

Counsel for Environmental Defence Society Inc

Address for service of Applicant:

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48 Shortland Street
AUCKLAND 1142
Telephone: 09 307 2972
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Attachment 4

Affidavit of Mark Bloomberg on behalf of EDS

BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH

ENV-2023-CHC-

TE KOOTI TAIAO O AOTEAROA
OTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
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BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

AFFIDAVIT OF MARK BLOOMBERG ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED IN SUPPORT OF APPLICATION FOR DECLARATIONS

AFFIRMED 30th **JANUARY 2023**

Solicitor
Cordelia Woodhouse
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Counsel
Rob Enright
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I, Mark Bloomberg, of Christchurch, affirm:

1. My name is Mark Bloomberg. I am an adjunct senior fellow at the School of Forestry, University of Canterbury.

2. This affidavit is provided in relation to an application by the Environmental Defence Society Incorporated (EDS) for declarations concerning the National Environmental Standards for Plantation Forestry (NES-PF) and the erosion susceptibility classification (ESC) that underpins the NES-PF. I have been asked by EDS to provide expert affidavit evidence in relation to the following:

    i. A description of the ESC's land classification system and its limitations.

    ii. Current application of ESC in the NES-PF, i.e. how the NES-PF uses the ESC to determine the activity status of plantation forestry activities.

    iii. A description of ESC zoning in the Marlborough region.

    iv. Comment on the implications of high ESC ('orange') zoning in these regions (which provides for forest harvesting and some earthworks to be permitted activities).

    v. Issues with the current application of the ESC in the context of the NES-PF:

        a. The ESC is inappropriate for measuring erosion susceptibility at the scale of forestry operations.

        b. Permitted activity status is inappropriate for harvesting and earthworks on orange ESC land.

        c. The lack of a rigorous risk assessment process in the NES-PF.

        d. Possible remedies to address the issues identified.

3. Annexed to this affidavit are relevant parts of the NES-PF and guidance documents.

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QUALIFICATIONS AND EXPERIENCE

4. My qualifications are B.For Sc. (Hons) from the University of Canterbury and an M. Appl.Sc and PhD in forest science from Lincoln University. My professional forestry experience extended from 1979-1999, as a professional forester for the NZ Forest Service and private companies and as a soil conservator for the Marlborough Catchment Board, Nelson-Marlborough Regional Council and Marlborough District Council. I then worked part-time as a lecturer in agroforestry and silviculture while completing postgraduate studies at Lincoln University, graduating in 2009. I have subsequently worked as a lecturer and researcher at Lincoln University and the University of Canterbury.

5. My research interests include interactions between trees and the soils on which they grow. In 2011, I was awarded a contract to develop the first version of the erosion susceptibility classification (ESC) for the Ministry for the Environment. I have continued this research by investigating the susceptibility of catchments to debris flows and other landslides in Te Tau Ihu| Nelson-Marlborough, as well as alternatives to clearfell harvesting systems for plantation forests in New Zealand. Note that my research in this area is collaborative. I work closely with colleagues who have geospatial science, forest engineering, geomorphology and natural hazard management skills. My expertise is in integrating the contributions of my collaborators into decision-support tools for managing landslides and other soil-based problems in the context of land and forest management.

CODE OF CONDUCT

6. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it. I confirm that the issues addressed in this affidavit are within my expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I have specified where my opinion is based on limited or partial information and identified any assumptions I have made in forming my opinions.

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OVERVIEW

7. The NES-PF is a set of regulations under the Resource Management Act 1991 (RMA). They are intended to provide certainty for commercial plantation forestry by setting nationally consistent RMA planning and compliance requirements for specified activities. The NES-PF covers eight core activities (afforestation, replanting, pruning & thinning, earthworks, river crossings, quarries, harvesting and mechanical land preparation).

8. The NES-PF uses several science-based tools to help council staff and foresters plan and manage forestry operations. The ESC tool spatially depicts a landscape's susceptibility to erosion, slope failures and landslides. The ESC classifies land according to a four-colour "traffic-light" system, where green=low, yellow=moderate, orange=high and red=very high ESC (Figure 1)

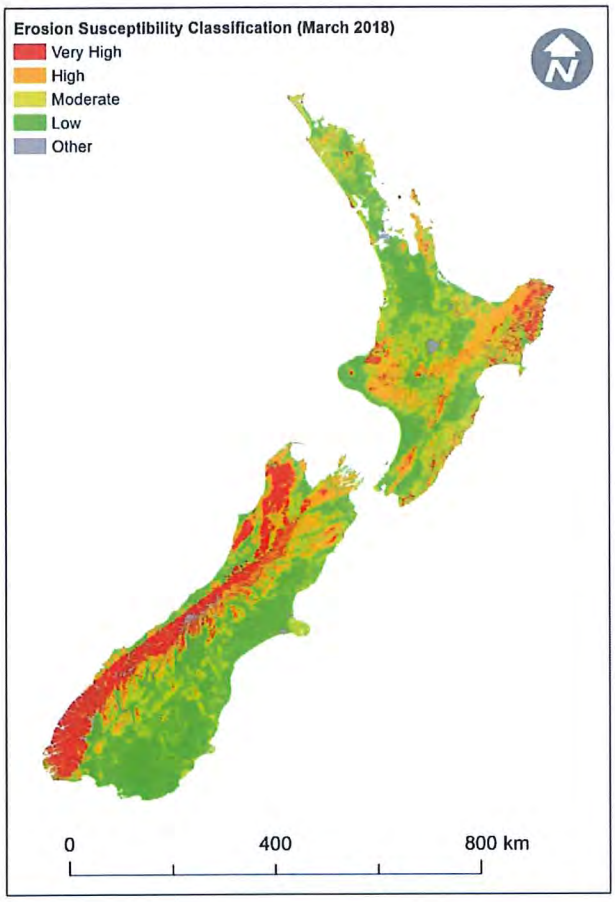

Figure 1: Erosion Susceptibility Classification for North and South Islands, excluding the conservation estate. Source: David Palmer (Scion) and Te Uru Rakau

9. Under the ESC, most New Zealand hill country and steeplands are classified as high (orange) or moderate (yellow) ESC. There are also significant areas of hill country and steeplands classified as low (green) ESC, mainly in the South Island. Red ESC is largely restricted to highly erodible soft-rock terrains in the North Island and mountainous areas in both the North and South Islands, where commercial plantation forestry is not feasible.

10. The table below shows the plantation forest areas in Marlborough District by each of the ESC classes. The same classification is shown for Gisborne|Te Tairāwhiti for comparison. It is clear that while plantation forest areas in the very high (red) ESC are minimal in Marlborough, the areas in the high (orange) ESC are significant—50% of the plantation forest area for Marlborough. Orange ESC plantation forests are found mainly north of the Wairau River in Marlborough, including the Marlborough Sounds.

Table 1. Analysis of ESC areas. Data sourced from a table published by TUR (https://www.mpi.govt.nz/dmsdocument/29804-Erosion-Susceptibility-Classification-by-class-area-of-plantation-forestry-excluding-Department-of-Conservation-Land)

	Plantation Forest Area (ha)		
ESC Class	**NZ Total**	**Gisborne| Te Tai Rāwhiti**	**Marlborough**
Red	141,789	104,432	146
Orange	355,375	22,475	40,688
Yellow	781,205	56,473	12,428
Green	785,418	5,333	28,645
Total	2,063,787	188,713	81,907

11. The NES-PF uses the ESC to determine whether a resource consent is required to undertake certain plantation forestry activities. The NES-PF imposes fewer controls on activities conducted on lower ESC (green and yellow) land and more controls on higher ESC (orange and red) land. Thus, the ESC is critical to the level of regulation applied to forestry activities under the NESPF.

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12. My affidavit focuses on the ability of the NES-PF to control significant adverse effects arising from earthworks and harvesting, in terms of slope or earthworks failures leading to landslides and discharges of slash, logging debris, waste logging material and/or sediment onto land in circumstances where it may enter waterways. I conclude that the NES-PF does not adequately regulate adverse sediment and slash discharge effects from plantation forestry harvesting and earthworks for the following reasons:

    i. The permitted activity status does not give certainty that these adverse effects will not occur on orange ESC land, where landslides on clear felled sites can result in significant adverse effects on receiving environments.

    ii. The NES-PF and guidance documents do not adequately address problems with the scale and accuracy of mapping for the ESC and the need for hazard mapping by qualified terrain stability professionals.

    iii. The NES-PF lacks a formal landslide and erosion risk assessment framework. The NES-PF, as currently written, conflates erosion susceptibility, hazard and risk, which are distinctly different concepts.

PERMITTED ACTIVITY STATUS FOR EARTHWORKS AND HARVESTING ON ORANGE (HIGH) ESC LAND

13. On orange (high) ESC land, earthworks and harvesting can occur as a permitted activity subject to conditions including (but not limited to):

    i. Restriction on the size of the earthworks (volume and batter height)

    ii. Earthworks must be on slopes <25 degrees

    iii. Sediment originating from harvesting must be managed to ensure that after reasonable mixing it does not give rise to any of the following effects in the receiving waters:

    iv. any conspicuous change in colour or visual clarity:

    v. the rendering of fresh water unsuitable for consumption by farm animals:

    vi. any significant adverse effect on aquatic life.

14. There are also conditions relating to the effects of sediment and slash in terms of damage to downstream infrastructure and properties.

15. If these conditions can be met, harvesting on orange ESC land can occur without resource consent. However, as discussed below, permitted activity conditions are unlikely to be met, which can result in significant adverse effects.

CLEARFELL HARVESTING LEADS TO A TEMPORARY INCREASE IN THE RATE OF LANDSLIDING AND DISCHARGE INTENSITIES

16. I will address four important sources for discharges from clearfelling harvests:

    i. Skid site failures. Slash piles commonly accumulate around the edges of skid sites. If these slash piles are not properly managed, they may also contain earth and similar material mixed in with the slash. These can become unstable and are vulnerable to collapse, triggering mass movements of soil and debris.

    ii. Road failures. Roads constructed as part of forest harvesting operations can slump and collapse during landslide-triggering rainfall events.

    iii. Slope failures leading to landslides on steep unstable hill slopes comprising part of the forest area.

    iv. Harvesting debris that is left lying on the steep hill slopes after harvesting is completed. This debris can be located in stream channels or, alternatively, slide or be translocated into channels by landslides.

17. Discharges from sources (i) and (ii) (skid site and road failures) can be mitigated by compliance with resource consent conditions (when operations are subject to consent) or recommended practice in the NZ Forest Owner's Environmental Code of Practice (ECoP). During intense landslide-triggering rainfalls, failures and discharges may occur even with full compliance with consent conditions and the ECoP— but should be reduced in severity.

18. Discharges from sources (iii) and (iii) (slope failures and harvesting debris) are more problematic.

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19. The clearfelling of a mature forest is a 'preparatory factor', making landscapes more susceptible to slope failure and higher landslide densities than would occur under a forest cover.

20. During landslide-triggering rainfalls, slope failures can occur even under mature forests. However, during the 'window of vulnerability' after clear-fell harvesting, the new replanted tree crop has not completely occupied the soil with its roots, nor does its canopy completely cover the ground. Therefore, its capacity to mitigate slope failures during landslide-triggering storms is reduced, resulting in an increased rate of slope failures, landslides and discharges of sediment and slash. The 'window of vulnerability' duration depends on the new crop's growth rate and the density of the replanted seedlings but is estimated to last about six years after the new crop is replanted (Phillips et al. 2018).

HARVESTING ON ORANGE ESC LANDS IS UNLIKELY TO MEET PERMITTED ACTIVITY STANDARDS

21. By definition, orange ESC lands are susceptible to landsliding. However, landsliding will not occur until a landslide-triggering event, usually a high-intensity or long-duration rainfall. Landslide-triggering rainfall events have an annual exceedance probability (AEP) of ~0.1 throughout much of lowland New Zealand, which equates to a 50:50 chance of such a rainfall event occurring during the six-year 'window of vulnerability' after clearfell harvesting.

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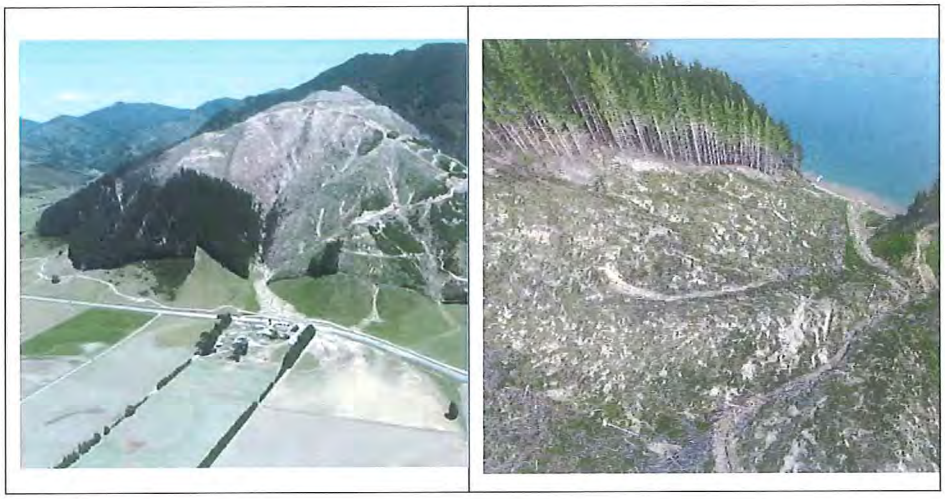

Figure 2. Debris flows from harvested forests on orange ESC land in North Marlborough, 2010 (Left) and 2018 (Right). The debris flow on the left crossed SH6 and narrowly missed an occupied house. The debris flow on the right resulted in debris and slash deposition into the sea adjacent to a marine farm.

22. For example, North Marlborough has experienced (to my knowledge) five major landslide-triggering rainfall events in the last 12 years, in 2010, 2018 (Cyclones Gita and Fehi), 2021 and most recently, in August 2022. There have been several smaller events in North Marlborough since 2010, including two in 2016 and 2017, where forestry companies were prosecuted and convicted for slash and landslide debris discharges.

23. Landslides from clearfelling sites in Marlborough in 2010, 2016, 2017, 2018, 2021 and 2022 have all occurred on orange ESC land. Many of these landslides have resulted in significant adverse effects, resulting from discharges into waterways, the receiving marine environment, impacts on the built environment, and in some cases, threats to human safety. These adverse effects require control through site-specific management.

24. Based on my experience gained since 2010, harvesting on orange ESC forest land in Marlborough has frequently breached the permitted activity standards in the NES-PF. Except for minor earthworks associated with maintenance or upgrade, it is hard to justify permitted activity status for earthworks and clearfell harvesting on orange ESC land.

25. Therefore, given the site-specific nature and significance of landside effects after clearfell harvesting, the permitted activity conditions for orange ESC land

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specified in the NES-PF give insufficient certainty to foresters. This means that foresters are not able to assess with any reasonable certainty whether their harvesting activity will be able to comply with the permitted activity standards. Councils similarly cannot assess this.

26. In my opinion, permitted activity status in the NES-PF is inappropriate for plantation forestry earthworks and harvesting on orange ESC land.

ISSUES WITH THE ESC AND NES-PF

The ESC does not map erosion susceptibility at the operational scale or accurately map landslide hazards

27. The Ministry for Primary Industries and the scientists who developed the ESC have recognised its limitations. A key limitation is that the ESC maps are at a scale of 1:50,000. A 1:50,000 scale was originally intended to be used as a screening tool for operational planning that required further interpretation before being applied at a larger (more localised) scale.

28. A 1:50,000 scale is too coarse to identify smaller land units whose erosion susceptibility may differ from a surrounding larger area of land. For example, steep areas within an area of gentler topography may be highly susceptible to landsliding, but these areas will not be depicted in the 1:50,000 ESC map layer.

29. An extreme example was revealed at Moenui on Queen Charlotte Drive, Marlborough, in July 2021 (Figure 3). Here, land mapped by the ESC as entirely low (green) ESC experienced multiple landslide failures, including debris flows. A slope analysis revealed significant areas in the 26-35 and > 35-degree slope classes. The landsliding originated in these steep areas, causing significant adverse effects on built and natural environments and posing risks to human safety.

Figure 3. The area between Belvue Bay Road and Moenui Road showing multiple landslide scars after the July 2021 rainfall event. The coloured shading shows slopes: <26 degrees (green), 26-35 degrees (pale) and >35 degrees (red). Using the low (green) ESC to determine resource consent status may result in serious errors.

30. For completeness, I note that Schedule 3 of the NES-PF requires management plans to be submitted at a scale of 1:10,000 and an erosion susceptibility classification (NES-PF overlay map) to be included. As noted in the Erosion Susceptibility Classification and Operational Scale Forestry Earthworks Management and Harvest Management Plans Guidance, this is an essential second step in risk assessment: [1]

> *"After consulting the ESC, an essential second step in risk assessment to guide decision is detailed planning at an operational scale. Additional site-specific information, such as the likely effects of topography, soils, drainage and risks of high intensity rainfall events provide for the ESC outputs to be refined to a larger scale. It is not credible to apply (e.g. simply blow up/expand to a larger scale) the ESC at this scale without interpretation and/or adjustment to the operational management plans scale."*

31. However, in my experience, mapping at 1:10,000 is not commonly undertaken because:

[1] https://www.mpi.govt.nz/dmsdocument/32323-ESC-and-operational-planning-guidance

i. Many NZ forestry companies do not have the in-house skills to assess erosion susceptibility, hazard, and risk at an operational (1:10,000 scale);

ii. Discussions with regional council and forestry company staff in northern and central South Island suggest that most companies do not properly re-map ESC at 1:10,000 when submitting management plans.

Lack of formal risk assessment methods in the NES-PF

32. Finally, the NES-PF does not have a formal system for assessing erosion or landslide risk. A risk assessment is required to properly manage sediment discharges from plantation forestry earthworks and harvesting activities. Internationally, there is an accepted standard for assessing landslide risk (Fell et al., 2008). NES-PF guidance documents do not follow this standard and frequently conflate erosion susceptibility, hazard, and risk.

33. At the time of the ESC's development, this lack of appropriate risk assessment processes within the NES-PF was documented in published papers by me and the scientists at Manaaki Whenua Landcare Research, who developed the ESC in its present form. Essentially, we agreed that professional ESC mapping and landslide risk analysis should be undertaken to "*identify areas of potential risk in landscapes where forest activities could likely result in an increase in the supply of sediment and woody debris with significant resultant damage to infrastructure beyond the forest boundary*" (Marden et al. 2015).

34. In my opinion, for harvesting and earthworks on all orange ESC land, assessments of erosion susceptibility, hazard and risk need to be carried out by qualified terrain stability professionals to a scale of 1:10,000 or larger. The assessment must integrate erosion susceptibility, hazard and risk in a formal unified framework. Hazard mapping focuses on the location of landslide hazards and allows site-specific planning to manage risks arising from these hazards.

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SUMMARY

35. This affidavit has offered evidence to support the following assertions:

    i. Permitted activity status in the NES-PF is inappropriate for earthworks and harvesting on orange ESC land because:

        a. Landslides on clear felled sites can result in significant adverse effects on receiving environments; and

        b. The permitted activity status provides no certainty that earthworks and harvesting will not significantly increase the likelihood of these adverse effects on orange ESC land.

    ii. The NES-PF and guidance documents do not adequately address problems with the scale and accuracy of mapping for the ESC and the need for hazard mapping by qualified terrain stability professionals.

    iii. The NES-PF lacks a formal landslide and erosion risk assessment framework. The NES-PF, as currently written, conflates erosion susceptibility, hazard and risk, which are distinctly different concepts.

    iv. The effort put into planning and regulating earthworks and harvesting on orange ESC land needs to increase. This includes improvements to erosion hazard mapping and formal erosion risk assessment.

RECOMMENDATIONS FROM THIS AFFIDAVIT

36. This affidavit makes two main recommendations:

    i. Controlled activity status should be the default minimum for earthworks and harvesting on orange ESC land. This is because, on land highly susceptible to erosion, these activities have the potential to result in significant adverse effects.

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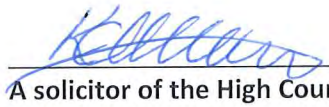
ii. Professional ESC mapping and landslide risk analysis at an appropriate scale and resolution should be undertaken for any harvesting and earthworks on hill country and steeplands where there are clear risks to the built and natural environment.

AFFIRMED at Christchurch)
by **Mark Bloomberg**)
this 30th day of January 2023)
before me)



A solicitor of the High Court of New Zealand

Kara Ellen Morton
Lawyer
Christchurch

REFERENCES

Fell R, Corominas J, Bonnard C, Cascini L, Leroi E, Savage W Z (2008) Guidelines for landslide susceptibility, hazard and risk zoning for land use planning. Engineering Geology 102: 85-98.

Marden M, Basher L, Phillips C, Black R (2015) Should detailed terrain stability or erosion susceptibility mapping be mandatory in erodible steep lands? New Zealand Journal of Forestry 59(4): 32–42.

Phillips C, Marden M, Basher L R (2018) Geomorphology and forest management in New Zealand's erodible steeplands: An overview. Geomorphology 307: 107-121

Appendix 1. Excerpts from the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

24 Permitted activity: regional council

(1) Earthworks are a permitted activity if regulations 25 to 33 are complied with and the activity is as specified in subclause (2).

(2) The earthworks may be—

(a) in a green or yellow zone; or

(b) in an orange zone with a land slope of less than 25 degrees; or

(c) in an orange zone with a land slope of 25 degrees or more and, in any 3-month period, comprise—

(i) side cutting to a height of 2 m to 3 m over a continuous length of no more than 100 m; and

(ii) the deposition of less than 500 m3 of spoil or fill; or

(d) in a red zone and, in any 3-month period, comprise—

(i) side cutting less than 2 m deep over a continuous length of no more than 50 m; and

(ii) the deposition of less than 100 m3 of spoil or fill.

26 Permitted activity conditions: sediment

Sediment originating from earthworks must be managed to ensure that after reasonable mixing it does not give rise to any of the following effects on receiving waters:

(a) any conspicuous change in colour or visual clarity:

(b) the rendering of fresh water unsuitable for consumption by farm animals:

(c) any significant adverse effect on aquatic life.

34 Controlled activity: regional council

(1) Earthworks are a controlled activity if the earthworks are in an area and of a volume specified in regulation 24, and regulation 25 is not complied with.

(2) Control is reserved over the information on the activity required by the notice under regulation 25(1).

35 Restricted discretionary activity: regional council

(1) Earthworks are a restricted discretionary activity if the earthworks are in an area and of a volume set out in regulation 24, and any provision of regulations 26 to 33 is not complied with.

(2) Earthworks are a restricted discretionary activity in—

(a) any orange zone with a land slope of 25 degrees or more where the threshold specified in regulation 24(2)(c) is exceeded; and

(b) any red zone where the threshold specified in regulation 24(2)(d) is exceeded; and

(c) any zone where the earthworks are the maintenance and upgrade of existing earthworks and exceed the threshold in regulation 24(3); and

(d) any zone where the earthworks are for forestry road widening or realignment and exceed the thresholds and standards in regulation 24(4); and

(e) any area where the land is undefined in the erosion susceptibility classification.

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65 Permitted activity conditions: sediment

Sediment originating from harvesting must be managed to ensure that after reasonable mixing it does not give rise to any of the following effects in the receiving waters:

(a) any conspicuous change in colour or visual clarity:

(b) the rendering of fresh water unsuitable for consumption by farm animals:

(c) any significant adverse effect on aquatic life.

67 Permitted activity conditions: ground disturbance

(1) Harvest systems must be planned and located to achieve butt suspension wherever practicable.

(2) Disturbed soil must be stabilised or contained to minimise sediment entering into any water and resulting in—

(a) the diversion or damming of any water body; or

(b) degradation of the aquatic habitat, riparian zone, freshwater body, or coastal environment; or

(c) damage to downstream infrastructure and properties.

69 Permitted activity conditions: slash and debris management

(1) Slash from harvesting must be placed onto stable ground.

(2) Slash from harvesting that is on the edge of landing sites must be managed to avoid the collapse of slash piles.

(3) Slash from harvesting must not be deposited into a water body or onto the land that would be covered by water during a 5% AEP event.

(4) If subclause (3) is not complied with, slash from harvesting must be removed from a water body and the land that would be covered by water during a 5% AEP flood event, unless to do so would be unsafe, to avoid—

(a) blocking or damming of a water body:

(b) eroding river banks:

(c) significant adverse effects on aquatic life:

(d) damaging downstream infrastructure, property, or receiving environments, including the coastal environment.

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Schedule 3
Forestry earthworks management plan and harvest plan
Specifications

2 Map
The plan must include a map or maps that include and show—
(a) a scale not less than 1:10 000:
(b) the computer freehold register, the date, and a north arrow:
(c) the harvest area boundary:
(d) the external property boundaries within 200 m of the harvest and earthworks area:
(e) the contour lines at less than or equal to 20 m intervals:
(f) the erosion susceptibility classification (NESPF overlay map):
(g) the proposed harvesting method (hauler or ground-base, or other) and arrows showing extraction directions to the skid or landing:
(h) the proposed forestry road locations, and landing or skid locations:
(i) any on-site risk areas as identified under clause (3).

3 Water and on-site areas
Water on site
(1) The plan must identify the location of and mark on a map—
(a) wetlands larger than 0.25 ha and lakes larger than 0.25 ha:
(b) rivers to their perennial extent:
(c) rivers where the bankfull channel width is 3 m or more:
(d) any outstanding freshwater body or water body subject to a water conservation order:
(e) the coastal marine area: (f) any setbacks.
Downstream risks
(2) The plan must,—
(a) for sites with a perennial river, identify the risks downstream of the operation, should slash or sediment be mobilised, to any—
(i) public roads and other infrastructure:
(ii) downstream properties and show the location of dwellings:
(iii) downstream river, lake, estuary or sea:
(b) identify any registered drinking water supply, including drinking water sources for more than 25 people within 1 km downstream of the activity:

Appendix 2. Excerpts from Erosion Susceptibility Classification and Operational Scale Forestry Earthworks Management and Harvest Management Plans Guidance

Purpose: The purpose of this document is to support the National Environmental Standards for Plantation Forestry Erosion Susceptibility Classification, and the requirement for finer scale mapping in Schedule 3 of the regulations.

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Appendix 3. Excerpts from "Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2018 Consenting and Compliance Guide"

4.2 A RISK-BASED APPROACH TO COMPLIANCE MONITORING

A risk-based approach to compliance monitoring is an effective way of targeting activities that have a higher risk of incidences of non-compliance, or where non-compliance will have a more severe risk of harm to people and the environment. A risk-based approach to compliance monitoring has the following benefits:

- Enables limited resources to be prioritised according to the level of risk of adverse effects on the environment.
- Targets activities and areas where non-compliance is most likely.
- Enables councils to respond quickly to changing and emerging risks.
- Provides for robust and transparent decision-making.
- Ensures a fair and consistent approach to compliance monitoring.....

.....In the context of compliance monitoring, a risk-based assessment takes into account the likelihood of non-compliance occurring and the risk of harm to people and adverse effects on the environment from that non-compliance. These two factors form a generic risk matrix as illustrated in Figure 2, sourced from the Regional Sector Strategic Compliance Framework 2016-2018.

Figure 2: Generic risk matrix (source: Figure 2, Regional Sector Strategic Compliance Framework 2016-2018, unpublished).

The level of risk in the risk matrix should be used to prioritise compliance monitoring activities and determine the most appropriate compliance monitoring approach, including timing, frequency and response. A risk-based approach to compliance monitoring under the NES-PF enables councils to assess:

- **The site-specific risks of particular *plantation forestry activities*** – the nature and scale of the *plantation forestry activity*, *Erosion Susceptibility Classification* (ESC) zoning, and sensitivity of the receiving environment will assist councils to assess site-specific risks under the NES-PF.....

6 Processing resource consents under the NES-PF

The NES-PF enables *plantation forestry activities* to be undertaken as permitted activities when the risks are lower and where the relevant permitted activity conditions are met. In other situations, foresters will need to obtain a resource consent, which may be for one or more of the following reasons:

- **Inherent site risk and/or exceeding a threshold** – the NES-PF introduces a resource consent requirement for certain *plantation forestry activities* located in the orange or *red zone* because of the inherent erosion risk on this land. In most cases, the NES-PF also includes an area or volume threshold for these activities before resource consent is required. For example, *afforestation* proposed in any *red zone* requires resource consent when the area to be planted is more than 2ha in any calendar year.

Attachment 5

Affidavit of Robert James Davidson on behalf of EDS

BEFORE THE ENVIRONMENT COURT **AT CHRISTCHURCH**	**ENV-2023-CHC-**
TE KOOTI TAIAO O AOTEAROA **ŌTAUTAHI ROHE**	
IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED** **Applicant**
AND	**MARLBOROUGH DISTRICT COUNCIL** **Respondent**

AFFIDAVIT OF ROBERT JAMES DAVIDSON ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED IN SUPPORT OF APPLICATION FOR DECLARATIONS

AFFIRMED FEBRUARY 2023

Ellis Gould
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Counsel
Rob Enright
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I, Robert James Davidson, of Nelson, affirm:

1. My full name is Robert James Davidson. I am an independent marine biologist based in Nelson.

2. This affidavit is provided in relation to an application by the Environmental Defence Society Incorporated (EDS) for declarations concerning the National Environmental Standards for Plantation Forestry (NES-PF) and the erosion susceptibility classification (ESC) that underpins the NES-PF.

3. I have been asked by EDS to provide evidence in relation to the following:

   (a) The biological values of the marine environment in the Marlborough Sounds
   (b) How sediment can affect those values
   (c) Adverse effect of sedimentation in the Marlborough Sounds

QUALIFICATIONS AND EXPERIENCE

4. I hold the qualification of Master of Science in Zoology (First Class Honours) obtained from Canterbury University (1986). I have worked for the Ministry of Fisheries (1986-87), and the Department of Conservation (DOC) (1987-95). During my time at DOC, I was based at Nelson and employed as the coordinator of marine biological surveys throughout the Nelson-Marlborough Conservancy. I was the principal author of several large-scale ecological reports and biological resource documents for marine areas in the DOC Nelson-Marlborough Conservancy. While at DOC I also coordinated resource inventory reports used by the Marlborough District Council (MDC), Nelson City Council, Tasman District Council and Canterbury Regional Council outlining ecologically important marine areas for inclusion in their respective coastal plans (Davidson *et al.* 1993; 1995).

5. In 1995, I left DOC and established my own practice, "Davidson Environmental Limited", which specialises in ecological research, survey and monitoring. To date, I have produced 1100 reports, most of which have been associated with resource consent applications under the Resource Management Act 1991 (RMA). Most of

these RMA related reports have been for marine farm impact assessments and monitoring.

6. I have also coordinated up to 29 consecutive years of monitoring for each of the three marine reserves located at the top of the South Island. Another long-term monitoring programme was the impact monitoring of ferries travelling through the Marlborough Sounds including Tory Channel (1995-2015). I coordinated a programme updating and reassessing the biological value of marine sites in the Marlborough Sounds (Davidson *et al*. 2011). This programme was extended from 2015 onwards with sites being revisited and new data collected to confirm their location and biological values (e.g., Davidson and Richards, 2015).

7. I have also been involved in several reviews and advisory roles including the Ecological Advisory Group for reviewing monitoring of the Tasman Bay Marine Farm Ring Road development, as a member of the MDC marine focus group, Top of the South Biosecurity Partnership, Marine Farming Association (MFA) *Undaria* Expert Advisory Group, Tasman and Golden Bay marine farm Expert Aquaculture Group, and Mapua Fruit Company contaminant clean-up programme.

8. I am the author or co-author of 19 conference papers in New Zealand and overseas. I have published 12 papers in international peer-reviewed scientific journals, including papers on marine reserves, subtidal soft bottom and reef communities. Based on a wide range of long-term studies combined with over 4000 working dives in the Marlborough Sounds, I have a very good understanding of the subtidal environment of the Marlborough Sounds.

PRIOR RELEVANT EXPERIENCE

9. I conduct contract work for a variety of organisations, some of whom regularly submit or are involved with the process of resource consent applications (e.g., DOC, MDC, Ministry for the Environment (MfE), Ministry of Primary Industries (MPI) and MFA). I contract to MDC and have or presently coordinate science-based studies (i.e., marine farm recovery study in East Bay, ferry impact study in Queen Charlotte Sound and Tory Channel, significant site survey and monitoring).

10. I take care to ensure that my role as a consultant for a variety of clients does not influence my role as an independent consultant. My relationship with clients and standing as an expert witness has been based on my responsibilities as a scientist, my expertise and my experience. My affidavit is therefore consistent with the best principles of scientific inquiry and any opinions and conclusions are based on my experience and understanding of biological theory, integrated with data collected during fieldwork throughout the Marlborough Sounds and New Zealand.

CODE OF CONDUCT

11. I advise that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and have complied with it in preparing this affidavit. I confirm that the issues addressed in this affidavit are within my area of expertise and I have not omitted material facts known to me that might alter or detract from my affidavit. Other than when I state I am relying on the advice of any other person, this affidavit is entirely within my area of expertise.

SCOPE OF EVIDENCE

12. This affidavit is structured into the following sections:

    (a) Summary
    (b) Biological values of the marine environment in Marlborough Sounds
    (c) Sediment threat to marine values
    (d) Examples of effects of excess sedimentation in marine areas

SUMMARY

13. The marine environment is impacted by a wide variety of anthropogenic (human-related) activities. Sediment, generated from land use activities in surrounding catchments and entering the marine environment, is consistently identified as one of the main sources of impacts (MacDiarmid *et al.*, 2012; MfE, 2016; 2019).

14. Since 1990, my working career has focussed on surveying marine areas to document their location and associated biological values. I have documented the loss of important biological values due to excess sedimentation (see examples below).

15. The Marlborough Sounds supports areas of high biological importance. In general, much of the Sounds' marine environment is greatly influenced by sediment arriving from catchments. In the past 10 years this phenomenon has been exacerbated by extreme rainfall events associated with climate change which bring significant sediment into the Sounds. There are multiple investigations that document the significant adverse effect these sedimentation events have on the marine biology of the Sounds.

BIOLOGICAL VALUES OF THE MARINE ENVIRONMENT IN MARLBOROUGH SOUNDS

16. Biological studies conducted in Nelson/Marlborough have shown estuaries and subtidal areas support species, habitats and communities with high biological importance (e.g., Davidson *et al*. 2011; Robertson and Stevens, 2012; Stevens and Robertson, 2017; Davidson *et al*., 2020).

17. For the subtidal marine environment, many of these areas (especially subtidal sites in Figure 1) are likely remnants of biological values that were once more widespread. Many of these sites are small, support fragile communities and are often the last of their kind in the region. As such, many of these sites are regarded as biologically important at a regional, national and, in some cases, international level (Davidson et al., 1995)

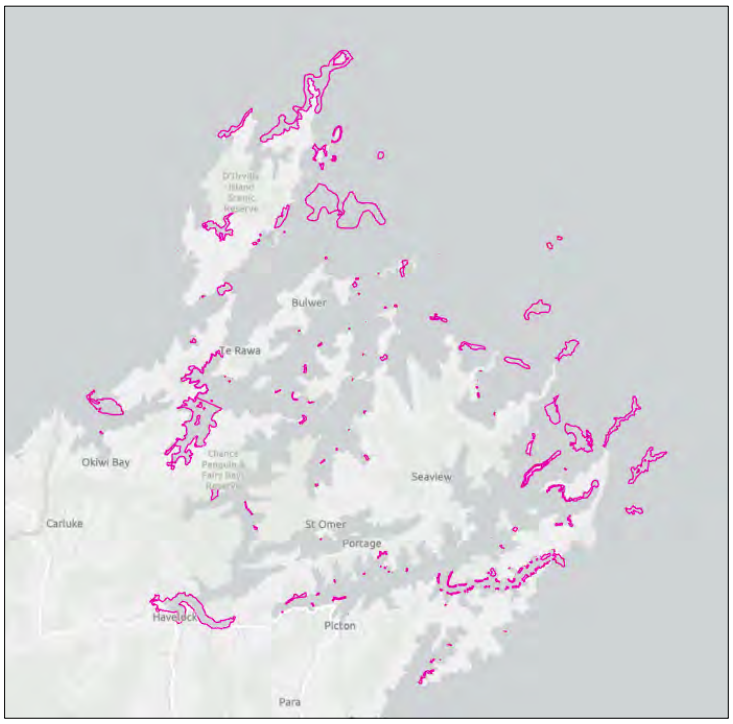

Figure 1. Known remaining subtidal significant sites in Marlborough (N=167)

18. For example, in Marlborough, there are two known remaining sites that support bryozoan corals growing on an offshore soft bottom benthos. Further, in Pelorus Sound there are only two remaining small sites (<1.3 ha) that support rhodoliths (calcified algae) in sufficient numbers to be called a bed. In New Zealand, giant lampshells are rarely found in shallow water, but in Marlborough *Neothyrus lenticularis* are recorded from shallow sites at a small number of sites. In my opinion, these examples of remnant significant sites are nationally important.

19. Many of these significant subtidal sites are sensitive to human activities. For example, biogenic habitat forming species are often filter feeders (e.g., hydroids, bryozoan corals, sponges). As such their feeding apparatus can be smothered by fine sediment particles (Plates 1, 2 and 3). Smothering of feeding appendages can result in the loss of these important habitats.

20. Once biogenic habitats have been smothered, they are slow to recover. For example, individual rhodoliths growing as beds are slow growing and long lived (i.e., decades old). They appear to be substrate specific (i.e., coarse soft substrata). It is unlikely they would colonise area smothered in fine muddy sediments. Sediment smothering

events can therefore be a long-term impact for these types of benthic communities.

Plate 1. Fine sediment coating over subtidal rocks along the Abel Tasman coast.

Plate 2. Hydroid smothered with fine sediment particles along the Abel Tasman coast.

Plate 3. Healthy hydroid tree near Dieffenbach Point, Tory Channel.

SEDIMENT THREAT TO MARINE VALUES

21. There are many anthropogenic activities that threaten marine values in Aotearoa New Zealand. Sedimentation from adjacent catchments is one of those. The export of terrestrial sediments, nutrients and organic material from catchments to streams and rivers, and ultimately into the coastal environment, is a natural process (Handley *et al*., 2017).

22. However, human activities, such as plantation forestry and land clearance in coastal catchments, has elevated the rate of sedimentation at and around the land-sea interface (Plate 4) (Gibbs, 2008; Gibbs et al., 2018).

Plate 4. Inner Pelorus Sound and the Pelorus River entrance (left) and Queen Charlotte Sound with no major rivers (right).

23. For example, in 2017, Stevens and Robertson produced a broad-scale survey of several Marlborough estuaries as part of an MDC estuary monitoring programme. As a pre-logging example, the authors stated for Kaiuma Bay Estuary "harvesting of exotic forestry on the steep hillsides in the lower catchment surrounding the estuary represents the highest current risk to the estuary". The authors calculated that 20% of the Kaiuma Bay catchment was in plantation forestry. On a positive note, Stevens and Robertson (2017) stated 73% of the catchment was indigenous forest and scrub and this would act to reduce harmful effects from inputs of sediment, nutrients and pathogens from the catchment.

24. Similarly, the nearby Havelock Estuary showed a very high level of muddiness likely exacerbated by human activities in its catchments (Figure 2). The major source of elevated levels of fine sediment are the catchments of the inner Pelorus Sound where there are relatively large production forestry blocks.

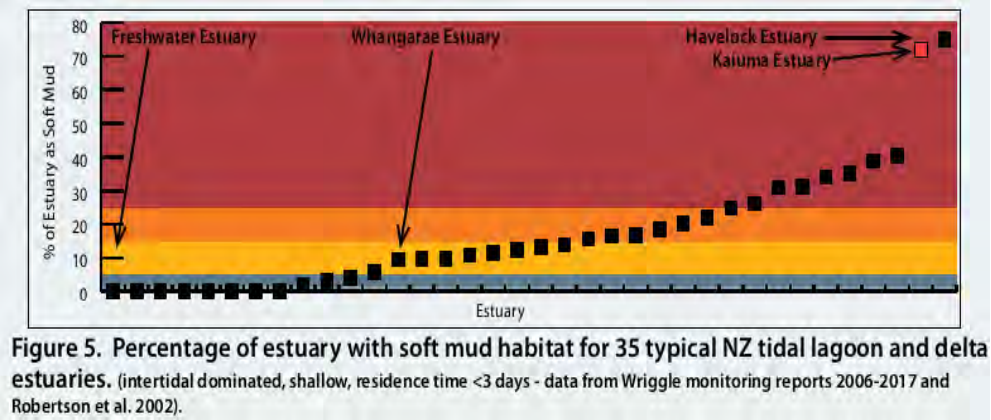

Figure 5. Percentage of estuary with soft mud habitat for 35 typical NZ tidal lagoon and delta estuaries. (intertidal dominated, shallow, residence time <3 days - data from Wriggle monitoring reports 2006-2017 and Robertson et al. 2002).

Figure 2. Percentage occupied by mud habitat in a range of estuaries from the natural catchment Freshwater Estuary (Stewart Island) to the modified catchment Havelock Estuary (Marlborough Sounds) (Stevens and Robertson, 2017)

25. Sedimentation is exacerbated during and immediately after storm and high rainfall events, where large pulses of sediment can be discharged into the marine environment resulting in adverse environmental effects. I note that adverse effects on marine values likely also occur due to prolonged or regularly repeated sedimentation events (i.e. cumulative). Sediment impacts have been documented in several reports in the coastal-marine receiving environment (Thrush et al., 2004; Lohrer et al., 2004; Lohrer et al., 2006a b; Morrison et al., 2009; Rodil et al., 2011; Robertson and Stevens, 2012; Pratt et al., 2013; Ulrich, 2015; Davidson, 2018; Ulrich & Handley, 2020).

Intertidal impacts

26. Lohrer (2021) reported that events that cause deposition <10mm sediment depth are much more common and pervasive than the dramatic large-scale events. The author stated that experiments conducted in North Island estuaries suggested that as little as 3mm of the terrigenous material can significantly alter macrobenthic community structure (measured after 10 days, relative to controls). The author suggested that at this low level of deposition, the number of individuals and species per area would likely decline, as would the densities of the common 'key' species (such as cockles and wedge shells), but the effects will likely be restricted to juvenile size classes and other small surface-oriented taxa.

27. The author also stated “With repeated deposition events (e.g., 3 mm thickness, monthly, over a 6-month period), the sandflat sediments will gradually become muddier, and macrofaunal community composition will progressively change. While 1 mm of terrigenous sediment deposition is not likely to kill many macrofauna, it can interrupt feeding and alter behaviours.”

28. Lohrer (2021) concluded “It appears that the gradual ‘muddying’ of coastal seafloor sediments (i.e., a transition from clean sandy substrate to a muddier habitat type) can dramatically alter biotic interactions and reduce the system’s capacity for primary production and nutrient recycling.”

29. In the immediate aftermath of storms, as little as 3 mm of sediment deposition has been shown to have measurable impacts on estuarine invertebrate communities (Lohrer *et al*., 2004; 2006a, b). Larger sedimentation events can be catastrophic. Lohrer (2021) stated:

> *“[S]udden deposits of terrestrially derived material delivered in the immediate aftermath of storms >100 mm thickness is generally considered to be ‘catastrophic’. At this thickness, they tend to smother and kill practically all underlying seafloor organisms. Only the largest, most mobile, and best burrowing species (for example, mud crabs) are able to survive events of this magnitude.”*

30. Recent large-scale climate change driven rainfall events in Nelson/Marlborough (e.g., February 2018; July 2021; August 2022) have caused significant sediment transport events and exacerbated negative impacts on the intertidal and subtidal environment (Davidson, 2018).

Subtidal impacts

31. High sedimentation events also often cause deposition of sediments onto the subtidal seafloor and increase the concentration of fine sediments suspended in the water column. The largest sediment particles settle out of suspension and are deposited on the seabed first, often close to the point at which they entered the coastal receiving body (Davidson, 2018). In contrast, the finest particles can remain

in suspension for long periods dispersing widely (Lohrer, 2021).

32. In Marlborough, and Pelorus Sound in particular, the depth light becomes attenuated is proximate to the inner Sound. In the inner Pelorus Sound, the water column is dark at depths as little as 10 m, whereas in the outer sheltered bays of the Marlborough Sounds (e.g., Admiralty Bay), light penetrates to 45 m depth.

33. The size of the area of greatly reduced light penetration extends from Havelock to Tawero Point, a distance of approximately 28 km. Terrestrially derived sediments deposited onto the sea floor are easily resuspended during large tide events. This tends to prolong the high turbidity phenomenon in inner Pelorus waters. Much of the main reach of inner Pelorus Sound is now turbid for most of the year (as per my observations). Some of the shellfish beds (e.g., scallops) in these inner Sound areas are now extinct (Handley et al., 2018) or at remnant levels and unlikely to recover while sediment deposition rates continue.

EXAMPLES OF EFFECTS OF SEDIMENTATION IN MARINE AREAS

34. In the following section I present some examples of the intertidal and subtidal effects of excess sedimentation.

Example 1

35. I coordinated a study of an estuarine area at the head of Hitaua Bay, Tory Channel over the period of pine harvest and for a period of years after harvesting was completed (Davidson et al., 2019). With regard to the biological importance of the site, a report outlining significant sites in Marlborough stated: “Hitaua Bay Estuary is the best example of an estuarine habitat in the Tory Channel biogeographic area” (Davidson *et al*., 2011).

36. In 2015, I coordinated a resurvey of the important estuarine area (Davidson and Richards, 2015). The authors of that report stated: “although it still supports estuarine habitats, it appears to have recently been influenced by the deposition of fine sediment from the logged catchment. Observations show a build-up of fine sediment over and around intertidal cobbles and a disappearance of some intertidal

species compared to a baseline survey conducted in 2003" (see Plate 5 from Davidson et al., 2019).

37. The authors also stated "cockles do remain in comparable densities to 2003, however, their mean size appears to have declined." Davidson and Richards (2015) concluded: "the site is no longer the best example of an estuarine habitat in Tory Channel and it is recommended that it be removed from the list of significant sites." The Marlborough Significant Site Expert Review Panel agreed, and the site was removed as a significant site (Davidson *et al*., 2015).

38. In 2019 the site was revisited, and the authors reported the intertidal area had partially recovered between 2015 and 2019 (Davidson *et al.,* 2019). The authors attributed this to reworking of the fine sediment from the intertidal area. At that point the significant site status was reactivated by the Significant Site Expert Panel.

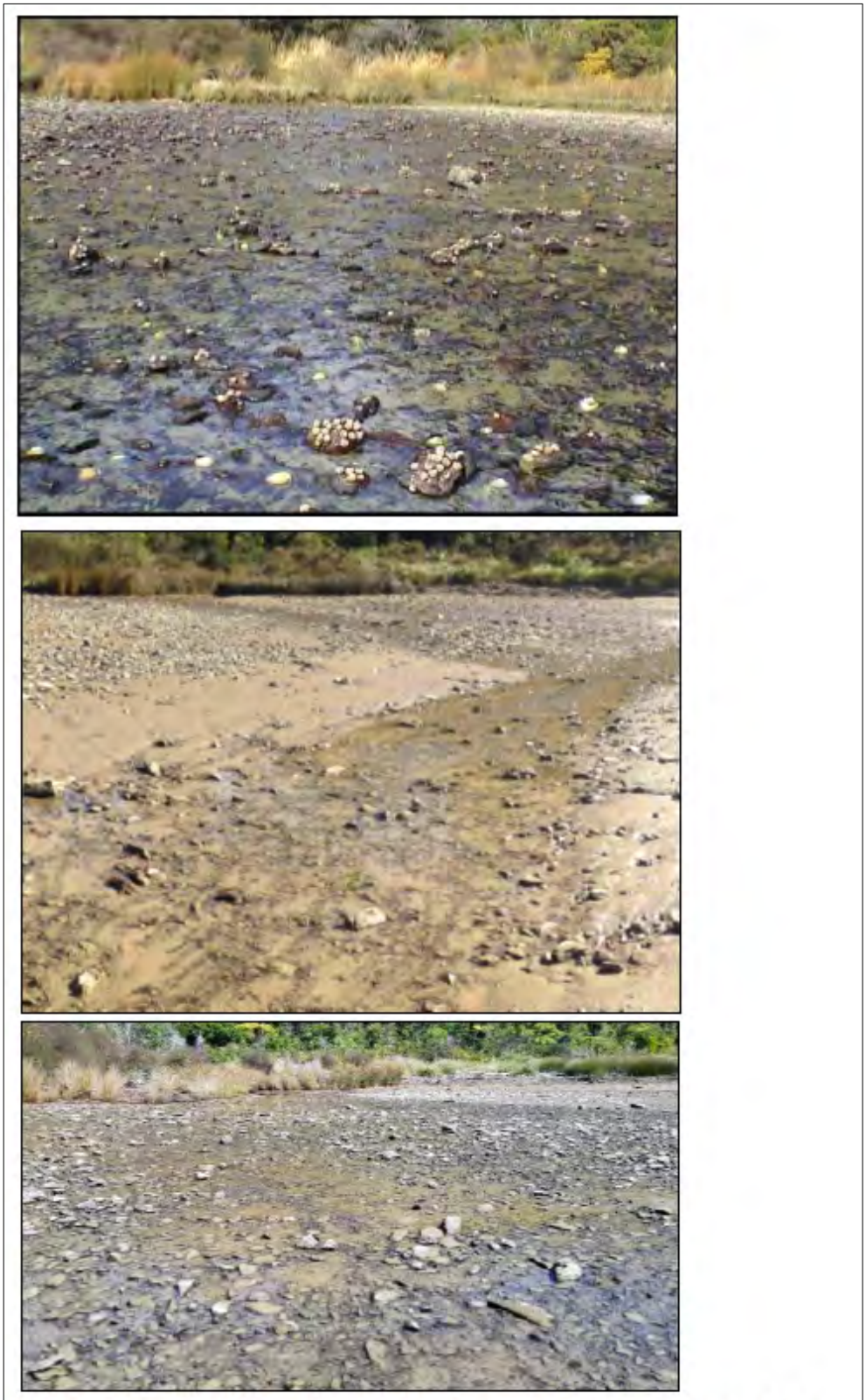

Plate 8. Estuary cobbles at stream. Top = 2003, Middle = 2015, Bottom 2019.

Plate 5. Sediment smothering in 2015 and a loss of intertidal top-shells. In 2019 the amount of fine sediment had declined (from Davidson *et al*. 2019)

Example 2

39. I coordinated sampling of an intertidal and shallow subtidal area adjacent to a barge loading site and a catchment clad in pine plantation in the Marlborough Sounds (Davidson *et al*., 2020). The intertidal area appeared little impacted by logging events, however, the shallow subtidal showed evidence of fine sediment deposition. Pine cones and wood debris were widespread over the mud benthos offshore of the intertidal area (Plate 6). The authors concluded the subtidal fine sediment and associated material were "a reflection of historical catchment effects during and soon after forest harvest events".

Figure 11 Silt and clay substratum at the impact site.

Figure 12 Silt and clay substratum at the impact site. Note: the presence of pine cones and wood debris.

Plate 6. Subtidal sediments dominated by very fine silt and clay particles with wood debris (Davidson *et al*. 2020)

Example 3

40. As part of the Sustainable Seas programme, I coordinated sampling of three Abel Tasman estuaries with native (1 estuary) and production forest catchments (2 estuaries) after a large storm event (Davidson, 2018). Deposition of a thick layer of fine sediment over the coarser sediment base was recorded over much of the two estuaries with recently logged forestry catchments (Plates 7 & 8), but not at the estuary with a native forest catchment.

41. The depths of the fine sediment layer were close to those described as a catastrophic effect by Lohrer (2021). In my opinion, the smothering of the original coarse sediments and the associated flora and fauna is the single worst estuarine impact I have observed in my career.

42. In general, estuaries with stable forested catchments have a low mud content. The estuaries of the Abel Tasman are good examples of this phenomenon being dominated by sands.

43. In a large-scale report on the status of Nelson estuaries Robertson & Stevens (2012) reported that Tasman estuaries were trending towards higher levels of "muddiness" and this trend was associated with modified catchments.

Plate 7. Layer of muddy sediment over the top of the underlying original coarse sediments (Kaiteriteri Estuary, 2018) (Davidson, 2018)

Plate 8. Layer of muddy sediment over the top of the underlying original coarse sediments (Otuwhero Estuary, 2018) (Davidson, 2018)

Example 4

44. In 2015 I produced a letter to MDC on behalf of the then owner of an oyster spat catching consent in Kaiuma Bay, inner Pelorus Sound. I commented on the build-up of sediment within and around oyster racks (Plate 9). I attributed the deposition of mud to the Pelorus catchment, the recent forestry activities and flood events that closed Havelock and Canvastown roads. I also commented that the racks appeared to exacerbate the build-up of sediment due to the structures themselves, compared to the surrounding areas.

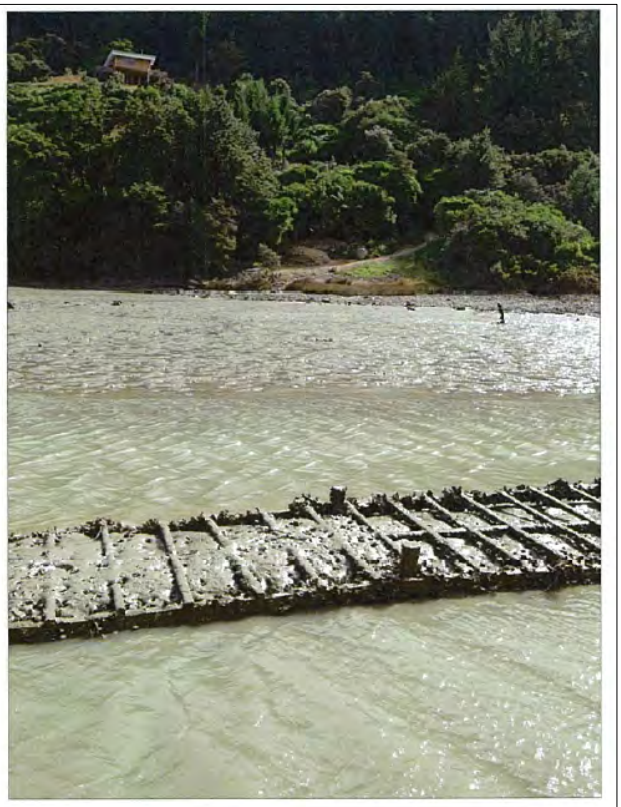

Plate 2. South-western inshore rack at 8477 in Kaiuma Bay.

Plate 9. Sediment buildup around and inside oyster racks in Kaiuma Bay (Davidson, 2015)

Example 5

45. Puriri Bay is a small bay at southern Otanerau Bay, East Bay. In 2015, the 14.3 ha red algae bed was one of the largest known of its kind in Queen Charlotte Sound (Davidson and Richards *et al*., 2015). The red algae *Adamsiella augustifolia* often covered a high percentage of the seabed (mean cover = 40-45% cover) in association with a variety of other species including scallops, giant lampshell and horse mussels. A transect through the algae bed was sampled annually from 2002 to 2013 by Davidson and Richards (2014) who reported red algae was consistently present. In the section of the transect where red algae were present, the percentage cover ranged from 30 to 80 % cover over the 11-year period (i.e., 100 and 150 m along their transect).

46. During the study period, algae percent cover estimates were collected twice (i.e., 2002 and 2015). The extent of the red algae bed in the wider bay was first sampled

using a drop camera in November 2008 and these were used to map its boundaries (see Davidson et al., 2011). Photos collected in January 2015 showed a reduction in the area occupied by red algae compared to 2008 (Plate 10). However, compared to 2002, the mean increased from 10-15% to 40 to 45% in 2015. Davidson and Richards (2015) stated the reason for the decline in the area occupied by red algae over the wider bay was unknown and suggested it may be natural as red algae in the western bay were less dense compared to the eastern side of the bay in 2008. The authors of the 2015 report noted recent logging activities at the head of Puriri Bay.

47. Anderson et al. (2020a) sampled Puriri Bay in 2018. The authors reported a further loss of red algae compared to previous surveys reported in Davidson and Richards (2015). The authors commented, "*Adamsiella* at site Q28 is unlikely to fare well under this amount of fine silt, indicating that further losses may occur" (see Plate 11 from Anderson et al., 2020a).

48. The same sites sampled in January 2015 were resampled using a drop camera in April 2021. The mean percentage cover of macroalgae in 2021 was zero at all but two stations. At most stations, the camera was allowed to drift to observe a wider area. No additional areas of macroalgae were observed.

49. Davidson et al. (2021) stated:

> "*the site is in relatively shallow (<21m depth) with a gently sloping gradient comprised of fine sands, silt and natural shell substrate around its edges and silt and shell in deeper areas. Levels of catchment derived sediment at this site have not been quantified, but it is likely the bay is susceptible to sedimentation due to its semi-enclosed and low current regime. According to 2014 MPI data, the bay has been dredged historically for* **scallops***. Dredging for scallops has not occurred since 2016. The reason or reasons for the algae decline after a stable period of several years (2002-2013) is likely associated with increased sedimentation (Plate 8b). Logging within Puriri Bay and beyond has likely increased sediment at the site as reported by Anderson et al. (2020)."*

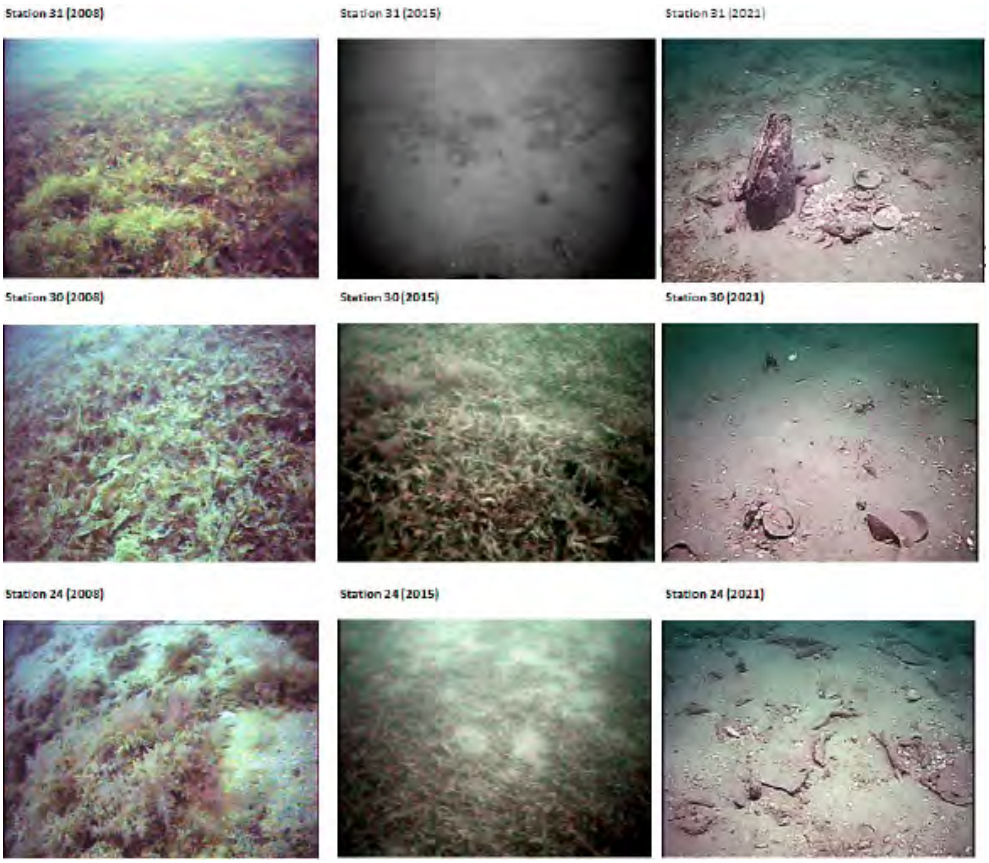

Plate 10. Time series photos from three stations in Puriri Bay. Note: stations sampled in 2008 are close to but not the exact locations sampled in 2015 and 2021

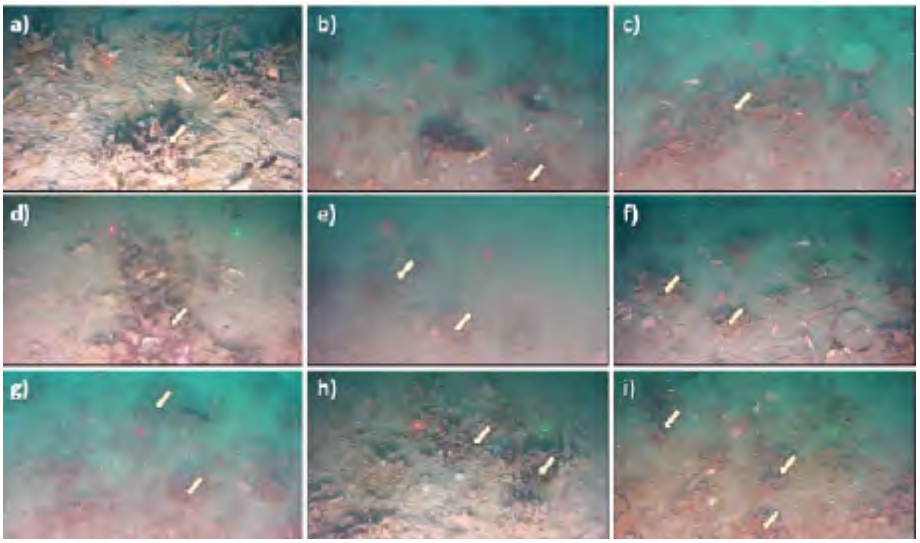

Plate 11. *Adamsiella* patches" (see arrows) in Puriri Bay (2018) (Anderson *et al*., 2020)

Example 6

50. The East Bay northern coastline is located northwards of the previous example in Puriri Bay. Several unpublished survey dives were conducted along this coast between 1990 to 1994 confirming the presence of giant lampshells (*Neothyrus lenticularis*), burrowing anemones (*Cerianthus* sp.), anemone (*Epiactus* sp.) and *Galeolaria hystrix* tubeworm mounds. The early unpublished survey data showed giant lampshells were present at an average density of 1.4 per m^2 between 24 and 32 m depth, however, Davidson and Richards (2014) showed giant lampshell can be present in as little as 20m depth in East Bay.

51. In 2021, I collected video from along five transects (Davidson *et al*., 2021). Video footage confirmed the site supported substrata and habitats comparable to those known for other areas in East Bay sampled over an 11-year period (Davidson and Richards, 2014). The video transects showed brachiopods (*Neothyris* and *Terebratella*) were rarely seen along video transects in the 2021 study. Other notable species present were burrowing anemone (*Cerianthus* sp.) and *Galeolaria* mounds, but these also were rarely seen.

52. The reason or reasons for the decline in lampshell, scallop and burrowing anemone abundance along this coast is unknown but it is coincidental with logging operations at the head of Puriri Bay.

CONCLUSION

53. In conclusion, sediment can result in significant adverse effects on the biological values of the marine environment. This has been reported as occurring in the Marlborough Sounds.

54. Sediment smothering in the marine environment appears most pronounced in intertidal and subtidal areas where streams and rivers deliver sediment from adjacent recently cleared catchments. This appears most pronounced for steep catchments and catchments with highly erodible soils. In these examples, intertidal areas can become smothered by fine sediment, including during large rainfall events.

Intertidal areas can slowly recover due to hydrodynamic process. Recovery of subtidal marine habitats and communities are less likely and the effects more prolonged compared to intertidal shores.

AFFIRMED at Nelson)

by **Robert James Davidson**)

this day of February 2023) _____

before me:)

_____

A Solicitor of the High Court of New Zealand

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Attachment 6

Affidavit of Dr James Whitney Griffiths on behalf of EDS

BEFORE THE ENVIRONMENT COURT **ENV-2023-CHC-**
AT CHRISTCHURCH

TE KOOTI TAIAO O AOTEAROA
OTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

AFFIDAVIT OF DR. JAMES WHITNEY GRIFFITHS ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED IN SUPPORT OF APPLICATION FOR DECLARATIONS

Affirmed 20 JANUARY 2023

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I, JAMES WHITNEY GRIFFITHS of, Nelson, affirm:

1. My name is James Griffiths. I am employed as a scientist at the Department of Conservation, Nelson, New Zealand.

2. This affidavit is provided in a private capacity in relation to an application by the Environmental Defence Society Incorporated (EDS) for declarations concerning the National Environmental Standards for Plantation Forestry (NES-PF).

3. I have been asked by EDS to:

   (a) Provide evidence that clear-felled plantation forests generate disproportionately more landslides during heavy rainfall events than other land cover classes on erodible hillslopes in the region.

   (b) Provide evidence that the erosion susceptibility classification (ESC) which underpins the NES-PF is an unreliable basis for regulating forestry activities in the region.

QUALIFICATIONS AND EXPERIENCE

4. My qualifications include a PhD in ecological science from Lincoln University. My professional experience extends from 2004-2023, working first as an ecological researcher in New Zealand for the Department of Conservation, the Animal Health Board, and Manaaki Whenua – Landcare Research; then as an environmental scientist for a Consortium of International Consultants in Kuwait and a researcher for the RSPB in England. Since 2011, I have held a permanent position as scientist with the New Zealand Department of Conservation.

5. My expertise is in the analysis of large ecological, climate and spatial datasets to describe patterns of animal and plant distribution, movement, demography, and phenology. This expertise is directly applicable to modelling the relationship between landslides and land cover, rainfall, and topography (e.g. Griffiths et al. 2020).

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CODE OF CONDUCT

6. I have read the Environment Court Code of Conduct for expert witnesses dated 2023 and agree to comply with it. I confirm that the issues addressed in this affidavit are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I have specified where my opinion is based on limited or partial information and identify any assumptions I have made in forming my opinions.

OVERVIEW

7. Landslides are a dominant process of hillslope erosion and sediment generation (e.g. McColl et al. 2022), and can cause substantial environmental, social and economic impacts.

8. In New Zealand and internationally, rainfall intensity and duration, seismic activity, lithology, topography, and land cover have all been identified as predictors of landslides. However, the relative importance of these predictors varies regionally and with spatial scale. Multiple-occurrence landslide events associated with major storms, therefore, may not be adequately described by general erosion susceptibility models.

9. Changes in rainfall intensity and duration and the frequency of severe storms associated with climate change (IPCC 2018) are predicted to increase the likelihood of rainfall-initiated landslide events in some regions (e.g. Crozier 2017; Crozier 2010), and highlight the need for reliable erosion susceptibility models to inform land management.

CLEAR-FELL HARVEST AND LANDSLIDE OCCURRENCE

10. In a study located in Tasman, New Zealand we modelled landslides that occurred between summer 2016 and March 2018, a period during which ex-tropical Cyclone Gita brought heavy rainfall to the region (Griffiths et al. 2020). We sought to understand the influence of rainfall, topography, lithology and land cover on landslide occurrence.

11. Our best fitting model had excellent predictive power (AUROC = 0.93[1]) and showed that land cover, elevation, rainfall, slope and aspect (ordered from stronger to weaker) were the strongest predictors of landslides.

12. Land cover class "clear-felled plantation forest" (CfPF), defined as areas where trees had been replanted after harvest but were <8 years old, occupied only 712.6 ha of the study area[2]. However, ~45% of this area had a predicted probability of landslides >75% and generated significantly more landslides per hectare than other land cover classes.

13. In contrast, 0.4% of the area classified as tall native forest and 6.4% of the area classified as closed canopy plantation forest had predicted probabilities of landslides >75%.

14. Using our model, we demonstrated that if clear-fell harvest in the study area ceased, and plantation forest was instead managed as continuous cover forestry, the area of clear-felled plantation forest with a predicted probability of landslides >75% might be reduced by ~271 ha.

15. These findings are consistent with studies conducted elsewhere in New Zealand (e.g. Dymond et al. 2006; Glade 2003; Marden and Rowan 1993, 2015; Page et al. 1994; Page et al. 2000) that highlight the vulnerability of deforested steeplands to landslides and sediment loss, and show replanted plantation forest can be associated with high landslide occurrence for up to 8 years after replanting (Marden and Rowan 1993).

RELIABILITY OF THE NES-PF ESC

16. In the same study, we separately modelled landslides as a function of the ESC data layer used to determine the level of control applied to forestry activities under the NES-PF.

17. We found the ESC was a poor predictor of landslides in the study area and failed to reliably discriminate areas of high landslide occurrence from

[1] "AUROC", area under the receiver operating characteristic curve, refers to a performance metric used to evaluate classification models. The score ranges from 1 to 0. Models with a score of 1 perfectly predict the response (e.g., landslides).

[2] In referring to "harvesting", I accept as relevant the definition of "harvesting" used in the NES-PF 2019.

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areas of low landslide occurrence.

18. This probably relates to the resolution of the ESC and the New Zealand Land Resource Inventory (NZLRI) on which it is based, as the scale (1:50000) of these data layers may be too course to adequately represent local scale (1:10000) variation in land cover, climate, or topography.

19. Deficiencies in the ESC could also be due the quality of the data contained in the NZLRI, which in some areas is 40 years out of date. The potential shortcomings of the ESC are well recognised (Basher et al. 2015; Bloomberg et al. 2011; Marden et al. 2015), and it was intended as a regional rather than local land use management tool (Bloomberg et al. 2011).

20. Nevertheless, the failure of the ESC to reliably discriminate areas of high landslide occurrence from areas of low landslide occurrence in our study area, which covered almost 20,000 ha, raises questions about the reliability of the ESC as a regional land management tool, and warrants investigation elsewhere. This is particularly relevant to the "orange zone" (areas identified by the ESC as high risk, but without any assessment of site-specific characteristics relevant to erosion and sediment generation during harvesting).

AFFIRMED at Nelson)

by **James Whitney Griffiths**)

this 31st day of January 2023)

before me:)

RICHARD CHARLES HORRELL

R.C. Horrell, JP
#00020
MOTUEKA
Justice of the Peace for New Zealand

~~A Solicitor of the High Court of New Zealand~~

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Attachment 7

Affidavit of Dr Sean Jeffrey Handley on behalf of EDS

BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH

ENV-2023-CHC

TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

AFFIDAVIT OF DR. SEAN JEFFREY HANDLEY ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED IN SUPPORT OF APPLICATION FOR DECLARATIONS

Affirmed 24 January 2023

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I, Sean Jeffrey Handley, of Nelson, affirm:

1. My full name is Sean Jeffrey Handley. I am a marine biologist employed by the National Institute of Water and Atmospheric Research (NIWA) and am based in Nelson.

2. This affidavit is provided in relation to an application by the Environmental Defence Society Incorporated (EDS) for declarations concerning the National Environmental Standards for Plantation Forestry (NES-PF) and the erosion susceptibility classification (ESC) that underpins the NES-PF.

3. I have been asked by EDS to provide evidence on studies relating to sediment sources in the Marlborough Sounds. Specifically, what those studies say in terms of the portion of marine sediments originating from *Pinus radiata* forestry and whether that sedimentation can be linked to deforestation and landslide/erosion events.

QUALIFICATIONS AND EXPERIENCE

4. My formal qualifications include MSc and PhD, both in marine biology. I have been employed as a marine ecologist by NIWA since 1998. I am a member of the Horoirangi Marine Reserve Committee in Nelson and have been a member of the Marlborough Sounds Ecologically Significant Marine Sites Expert Panel since 2018.

5. My role in NIWA is to lead research programmes and consultancy services in marine ecology, environmental assessment, aquaculture, and resource use and protection. I have published 30 papers in international, peer-reviewed scientific journals and more than 100 consultancy reports over the past 25 years.

6. I co-authored the report by Dr Andrew Swales and Dr Max Gibbs on sources of fine sediment in the Mahau Sound, Pelorus Sound/Te Hoiere (Swales et al.

2021)[1] (the Mahua Study is the subject of this affidavit). I was the lead author on the prior historical study that also documented sediment sources in Kenepuru Sound and Beatrix Bay, Pelorus Sound (Handley 2017).[2] More recently, I have documented sediment accumulation rates near Separation Point in Golden Bay (Handley 2020).[3]

PRIOR INVOLVEMENT IN RELEVANT PROJECTS

7. I have undertaken contract work for a variety of organisations for the purposes of RMA resource consent applications (e.g., marine farming companies), marine reserve monitoring programs (Department of Conservation), and research projects (e.g., NIWA, University of Auckland, and Ministry of Primary Industries). I have also contracted my services to Marlborough District Council and have completed various research, review and historical studies for them.

CODE OF CONDUCT

8. I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court of New Zealand Practice Note 2023 and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this affidavit are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

OVERVIEW OF MAHAU STUDY

9. The Handley (2017)[2] report (referred to above) documented an average of greater than ten-fold increase in sediment accumulation rates from multiple coring sites in the Pelorus Sound. Indigenous biodiversity, water quality, and other marine values have all been affected in recent decades by land-use

[1] Swales, A., Gibbs, M., M., Handley, S., Olsen, G., Ovenden, R., Wadhwa, S., & Brown, J. (2021). Sources of fine sediment and contribution to sedimentation in the inner Pelorus Sound/Te Hoiere Retrieved from NIWA Client report prepared for Marlborough District Council, 2021291HN, MDC17201.

[2] Handley, S., Gibbs, M., Swales, A., Olsen, G., Ovenden, R., & Bradley, A. (2017). A 1,000 year seabed history Pelorus Sound/Te Hoiere, Marlborough. NIWA Client report Prepared for Marlborough District Council, Ministry of Primary Industries and the Marine Farming Association. No. 2016119NE, MDC15401.

[3] Handley, S., Horrocks, M., Willis, T., Bradley, A., Bury, S., Brown, J., & Northcote, L. (2020). Historical analyses of coastal marine sediments reveal land-based impacts on ecosystem productivity. New Zealand Journal of Ecology, 44(2), 1-10.

activities and intensification. This has increased sediment, nutrient and microbial loads to Pelorus Sound and increased marine activities that disturb or degrade benthic (seabed) ecosystems[2,4].

10. The Mahua Sound is located within the inner Pelorus Sound in the Marlborough Sounds. The Sounds comprise partially submerged, unglaciated river valleys with steep topography and highly erodible soils with clay content of up to 60%[5]. The Pelorus Sound is fed by the Pelorus and Kaituna Rivers within the 1,149 km^2 catchment.

11. The objectives of the follow-up Mahau Study were to: i) determine the Sediment Accumulation Rates in the Mahau Sound relative to pre-human conditions, ii) determine the sources of sediment accumulating in the inner Sound, and iii) identify sources of sediment that are over-represented as a proportion of land use area in the Pelorus and Kaituna catchments.

12. The Study found that the erosion of soil from the land and its deposition in estuaries and the sea is a natural process, but the rate sediment is being deposited is higher than before human activities disturbed the natural land cover. The main contributors to sediment in Te Hoiere/Pelorus Sound are subsoil, stream bank erosion, dairy pasture, harvested pine and native forests. The proportions vary according to the location. However, sediment cores in Mahau Sound all demonstrated disproportionate contribution of sediment from harvested pine cover, as compared to equivalent land areas under other land uses or native vegetation.

13. The effects of increased soil erosion and sedimentation have ranged in scale, from localised impacts on cockle beds due to early Māori activities in Mahau Sound to extensive catchment-wide soil erosion and sedimentation since European settlement.

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[4] Robertson, B., Stevens, L. (2009) Rai Valley Sustainable Farming Project: Preliminary assessment of river and coastal issues. Report for NZ Landcare Trust. Wriggle Coastal Management, Nelson.

[5] Urlich, S.C.; Handley, S.J. 2020. From 'clean and green' to 'brown and down': A synthesis of historical changes to biodiversity and marine ecosystems in the Marlborough Sounds, New Zealand. Ocean & Coastal Management 198: 105349.

BRIEF SUMMARY OF SEDIMENT SOURCE TRACING METHODOLOGY USED IN MAHUA STUDY

14. **Sediment accumulation rates (SAR)** in Havelock Estuary and Mahau Sound over the last century were estimated. Sediment cores collected from the inner Mahau Sound were sectioned and sediments analysed using two independent radioisotope dating methods, lead-210 [^{210}Pb] and caesium-137 [^{137}Cs]. Pre-historic SAR in the Mahau Sound were derived from radiocarbon dating of cockle shells collected near the base of the cores.

15. **Sediment sources** were traced using CSSI (Compound Specific Stable Isotope) methods. This method, developed by Dr Gibbs in the mid-2000s (Gibbs, 2008)[6], was endorsed by the International Atomic Energy Agency and is now used in over 40 countries across the world, with the original publication being cited nearly 150 times. The protocol has also been tested in the New Zealand Environment Court and accepted as a consent compliance monitoring tool[7].

16. The CSSI method employs the isotopic (i.e., δ^{13}C) signatures of fatty-acid (FA) biomarkers secreted by plant root systems that are used as proxies to discriminate soil sources by land-use (i.e., plant community). As plant communities grow roots, they produce species-specific FAs. Because these FAs are slightly water soluble and highly polar, they can spread through the soil in the root zone and ionically bind to soil particles. FAs with carbon-chain lengths of 12 to 26 atoms (C12:0 to C26:0) have been found to be particularly suitable for sediment-source determination because they are conservative as they remain bound to soils for decades to millennia.

17. The suite of FAs produced by plant communities composed of a number of plant species provides a unique 'fingerprint' for different plant communities, that are used as a proxies to differentiate different land uses. Once eroded, and delivered to rivers, the soils with their FA signatures can be used to identify the sources of sediment deposited in receiving rivers, lakes, estuaries, and coastal

[6] Gibbs, M. M. (2008). Identifying Source Soils in Contemporary Estuarine Sediments: A New Compound-Specific Isotope Method. Estuaries and Coasts, 31, 344-359. doi:10.1007/s12237-007-9012-9

[7] Environment Court Decision No. [2018] NZEnvC 202 – Whangamarino Wetland

environments by plant communities. [For more in depth explanation, see Appendix C, P129-132, of Swales et al. (2021)[1]]

18. **CSSI uses**: The CSSI sediment-tracing approach can be used to:

    a) Differentiate sediment sources by land use (i.e., plant community) type.
    b) Differentiate sediment derived from streambank and subsoil sources from land use sources.
    c) Determine the contribution of sediment by sub-catchments.

19. When percentage source proportions are coupled with sediment yield data, source-specific sediment yields (e.g., tonnes km^{-2}) can be estimated. This can be done by subcatchment and/or for a specific land use.

20. The CSSI method can also be used to reconstruct changes in the contributions of different sources over time (i.e., decades to centuries) when applied to dated estuarine sediment cores and constrained by a reliable land use history.

21. **Soil sampling requirements**: To enable us to determine what proportion of the samples collected at coring sites were from which erosion source or land-use, soil samples were collected in several phases during February 2017 to December 2019. Sampling included:

    a) Land use topsoils (e.g., native forest, farmland [dairy, sheep], plantation forestry, harvested pine).
    b) Subsoils, river and streambank sediment, fine-sediment deposits in river channels, and surficial marine sediment from the entrance to Pelorus Sound (i.e., Chetwode Islands/Nukuwaiata and Te Kakaho) (see Figure 1, Appendix 2).
    c) Sampling sediment at different points above and below tributaries of Kaituna and Pelorus Rivers (see Table 1, Appendix 2).
    d) Sediment cores collected at three locations in Mahau Sound.

22. **Analytical methods**: The soil samples were used to assemble a 'library' of FA

biotracer data for potential soil/sediment sources.

23. The CSSI sediment-tracing technique employs two different sets of stable isotope analyses/signatures:

    a) Bulk $\delta^{13}C$ values and percentage carbon (%C) of the whole soil or sediment.
    b) Compound specific stable isotopes (CSSI) using the $\delta^{13}C$ values of the carbon atoms in of individual FAs bound to soil and sediment particles.

24. A Bayesian statistics mixing model, MixSIAR, that uses a Markov Chain Monte Carlo (MCMC) sampling approach was used to construct the probability distributions of the sources for each deposited sediment sample (i.e., the mixture) (Stock et al., 2018)[8].

25. The mixing model was used to determine the percentage isotopic source proportions of various soil sources of deposits in the Kaituna and Pelorus rivers, along with sediment deposited in Mahau Sound, and historic sources from sediment cores.

26. To identify sub-catchments with excessive sediment yields, a 'recent' measure of Suspended Sediment Yield (SSY) based on CSSI analysis (sampled and measured in this study) is compared with a 'long-term' expected reference value based on the modelled average SSY (NZ River Maps, Booker and Whitehead, 2017)[9].

27. These two independent SSY estimates, when compared as ratios (i.e., SSY_{CSSI}/SSY_{NZRM}) were used to identify sources of sediment that are over-represented as a proportion of land use area in the Pelorus and Kaituna catchments.

28. **CSSI Suspended Sediment Yield (SSY_{CSSI})**: To provide the 'recent' measure of SSY, sediment from flood deposits were collected at three locations:

[8] Stock, B.C., Jackson, A., Ward, E.J., Parnell, A.C., Phillips, D.L., Semmens, B.X. (2018). Analyzing mixing systems using a new generation of Bayesian tracer mixing models. PeerJ 6: e5096: DOI 10.7717/peerj.5096.

[9] For clarity, please see explanation box from P.61, Swales et al. 2021, Appendix 1.

a) In the main river channel.

b) In the tributary channel upstream of the confluence

c) Downstream of the confluence (i.e., mixture).

29. These samples were analysed using the CSSI method to calculate tributary proportional contributions. These proportional contributions were then converted from source % proportional values to Suspended Sediment Yield (SSY).

30. **NZ River Maps (SSY_{NZRM})**: The 'long-term' average SSY for each subcatchment were calculated using sediment yield data provided by the NZ River Maps database (NZRM, Whitehead and Booker, 2019)[10]. Sediment yield data incorporated in NZRM is derived from measurements of suspended sediment yields from 233 New Zealand catchments, including validation from the Byrants site in the Pelorus Catchment (Bryants, site # 58902, Hicks et al. 2011)[11].

31. A SSY ratio of unity (i.e., 1) means that SSY values determined by both methods are identical and indicates that there is no excessive erosion in that catchment. A ratio higher than unity indicates that excessive erosion is occurring in the catchment during the time period when the sampled river sediment was deposited. The magnitude of the SSY ratio greater than unity indicates how excessive the erosion rate is.

RESULTS FROM THE MAHAU STUDY

32. The following results illustrate the disproportionate sediment supply from:

a) Different sub-catchments;

b) The outlet of the Pelorus River; and

c) Sediment cores in Mahau Sound, explaining the likely reasons.

[10] Whitehead, A.L., Booker, D.J. (2019) Communicating biophysical conditions across New Zealand's rivers using an interactive webtool. New Zealand Journal of Marine and Freshwater Research 53 (2): 278-287.

[11] Hicks, D.M., Shankar, U., McKerchar, A.I., Basher, L., Jessen, M., Lynn, I., Page, M. (2011) Suspended sediment yields from New Zealand rivers. Journal of Hydrology (New Zealand) 50(1): 81-142.

33. **Sources of river sediment deposits**: The following are results from catchment and subcatchment analyses of sediments deposited above and below river and stream confluences in the Pelorus and Kaituna catchments.

34. **Differences between catchments (Pelorus vs Kaituna)**: The Pelorus-Rai and Kaituna Rivers transport ~259,000 tonnes per year of suspended sediment to the Havelock Estuary, with ~90% of this sediment load delivered by the Pelorus-Rai River (NZRM model, Booker and Whitehead, 2017)[6] as compared with ~10% from the Kaituna River.

35. **Sub-catchments**: SSY ratio hotspot analysis indicated that CSSI-estimated SSY values for the Kaiuma and Brown sub-catchments were more than 10-fold higher than the NZRM SSY estimates. Conversely, the CSSI SSY estimates for the Upper Pelorus River and Wakamarina River were about half the NZRM SSY values. Those differences were attributed to differences in vegetation removal/disturbance and/or approximately double the annual average rainfall on western subcatchments compared to subcatchments on the eastern side of the Pelorus catchment[12].

36. The summary graph showing all land use soil contribution mean proportions relative to the sediment yield at the mouth of the Pelorus and Kaituna Rivers is in Figure 2 (see Appendix 2). These results show that streambank and subsoils were the largest sources of sediment, often exceeding 50% of the total sediment yield. It also shows that dairy pasture produced more sediment in the Rai River subcatchments than in the Upper Pelorus and Wakamarina sub-catchments. This is consistent with the higher proportion of dairy farming in the Rai River subcatchments. In contrast, sediment yields from harvested pine forest was similar from most subcatchments, except the Kaituna River where harvested pine forest was minimal.

37. The analysis of the river sediment deposited near the outlet of the Pelorus River to Havelock Estuary indicates that 55% of this sediment was sourced from subsoil and streambank erosion. Land use sources were dominated by dairy

[12] See Figure A1, P19, Swales et al. 2021.

pasture (23%) and harvested pine (18%). Native forest and kanuka scrub contributed the remaining 6% (see Figure 2, Appendix 2).

38. Figure 2 (Appendix 2) shows similar harvested pine/native forest source ratios at many of the sites where river deposits were sampled. However, there is an approximately 40-fold larger area of native forest (~640 km^2, LCDB-5/2018) as compared with harvested pine (i.e., bare ground post-harvest prior to replanting ~15.7 km^2). Despite the ~40-fold larger area of native forest relative to harvested pine, the sediment deposits at the Pelorus River outlet indicate that the native forest contributes approximately 20% of the amount of topsoil that is derived from harvested pine forest.

39. **Differences in erosion between canopies**: The large differences in the contributions of native forest and harvested pine topsoils to river deposits during the sampling period indicate differences in soil erosion rates. Forested landscapes (including exotic forests) generally generate less sediment than pasture landscapes (e.g., Eyles and Fahey, 2006, Phillips et al. 2012)[13], but this is not the case following the harvesting of pine forests. In that regard, I acknowledge the definition of "harvesting" used in the NES-PF 2017 as relevant, and broadly similar to the description used in the studies identified in this affidavit.

40. When plantation forests are harvested, pine root reinforcement is quickly lost, creating a 'window of vulnerability' (O'Loughlin and Watson, 1979)[14]:

> *"Between 2 years, when the replacement crop begins to reinforce the soil, and 8 years, when all reinforcement effects of the clear-felled stand have disappeared, there is a period of 6 years when the nett relative reinforcement is low"* (O'Loughlin 1985)[15].

[13] Eyles, G., Fahey, B. (2006) The Pakuratahi Land Use Study: A 12-year paired catchment study of the environmental effects of Pinus radiata forestry. Landcare report to Hawke's Bay Regional Council: 128.
Phillips, C., Marden, M., Basher, L. (2012) Plantation forest harvesting and landscape response – what we know and what we need to know. New Zealand Journal of Forestry 56(4): 4–12.

[14] O'Loughlin, C.L. Watson, A.J. (1979) Root-wood strength deterioration in Radiata pine after clear-felling. New Zealand Journal of Forestry Science, 9(3): 284-293.

[15] O'Loughlin C 1985. Influences of exotic plantation forest on slope stability implications for exotic forest management in the Marlborough Sounds. In: Proceedings of the Soil Dynamics and Land-Use Seminar, Blenheim. 313-328.

41. The tensile strength of small roots of *Pinus radiata* (<3cm diameter) decline in an exponential manner after felling of the parent trees, with roots at 20 months having lost about half their original tensile strength[16].

42. In the Pelorus-Rai catchment, the native forest canopy and dense understory with compact root mass largely protects topsoils from rainfall impact (see Figure 3a, Appendix 2). Mature pine forest has a more open understory (see Figure 3b, Appendix 2), which is periodically removed. While these general observations do not prove that there is less erosion from native forest than pine forest, the larger contributions of harvested pine to river sediment deposits in comparison to native forest suggest that this is the case (see Figure 2 Appendix 2). This is also consistent with the literature[10].

43. A study of paired native forest vs pine forest catchments (Waikato Region) found little difference between the erosion from both under medium to low rainfall but a three-fold increase in erosion from the pine forest during rainfall events with a greater than 5-year return period (Hughes et al. 2012)[17]. Similarly, a study of the aftermath from Cyclone Bola (March 1988, east coast North Island) found that substantially more soil disturbance occurred under pine than native forest (84% vs 67% respectively) during that storm (Hicks, 1991)[18]. Marden and Rowan (1993)[19] found that while landslide densities increased in mature indigenous forest following Cyclone Bola, indigenous forest was four times less susceptible to land sliding than areas of regenerating scrubland. In general, New Zealand studies have also found that mature native forest is more effective than pine trees for erosion mitigation (Phillips et al. 2000)[20].

44. The New Zealand Land Cover Database (LCDB) data for the Pelorus-Rai catchment show that landslides also occur in native forest, most likely associated with high-intensity rainstorms. These events will deliver

[16] O'loughlin C, Watson A 1979. Root-wood strength deterioration in radiata pine after clearfelling. NZ Journal of Forestry Science 9(3): 284-293.

[17] Hughes, A.O., Quinn, J.M., McKergow, L.A. (2012) Land use influences on suspended sediment yields and event sediment dynamics within two headwater catchments, Waikato, New Zealand. New Zealand Journal of Marine and Freshwater Research 46(3): 315–333.

[18] Hicks, D.L. (1991). Erosion under pasture, pine plantations, scrub and indigenous forest: a comparison from Cyclone Bola. New Zealand Forestry November 1991: 21-22.

[19] Marden, M., Rowan, D. (1993) Protective value of vegetation on tertiary terrain before and during Cyclone Bola, East Coast, North Island, New Zealand. New Zealand Journal of Forestry Science 23: 255–263.

[20] Phillips, C., Marden, M., Miller, D. (2000) Review of plant performance for erosion control in the East Coast Region. Landcare Research Contract Report LCD9900/111 prepared for the Ministry Agriculture and Forestry: 128.

substantially more subsoil to rivers than topsoil. Removal of vegetation on harvested pine areas will expose large areas of subsoils to erosion by rainfall and surface runoff and increase the risk of landslides due to progressive loss of root reinforcement of soils. This soil erosion risk persists for several years after these harvested areas are replanted (Phillips et al. 2012)[9]. Our finding that topsoil from harvested pine contributes 46 to 147 times more sediment than native forest (LCDB2-LCDB4)[21] also demonstrates the importance of harvested hillslopes as a source of sediment.

45. The soil source proportions calculated in Swales et al. (2021) may also reflect local hillslopes, with steeper upper catchment areas having a higher proportion of subsoil and bank erosion than the downstream catchments. Higher erosion rates in the upper catchments of the Pelorus-Rai system will also likely reflect rainfall distribution patterns[22] in this part of the Marlborough Sounds (see Figure 1, Appendix 2).

46. **Marine Sediment Accumulation Rates (SAR)**: Sediment core records indicate baseline pre-human SAR of 0.2–0.3 mm yr^{-1}, over the last ~2,000 years. These were very low and comparable with previous estimates in Kenepuru Inlet and Beatrix Bay (Handley et al. 2017)[2]. In contrast, European-era SAR in Mahau Sound have averaged 3.8 to 4.1 mm yr^{-1} since the early-1900s representing a ten-fold increase. The Mahau Sound SAR are also up to 90% higher (i.e., +1.8 mm yr-1) than the recommended Australian and New Zealand Environment and Conservation Council (ANZECC) default guideline value of no more than 2 mm yr^{-1} above the natural annual sedimentation rates (i.e., native-forest catchment, Townsend and Lohrer, 2015). These SARs are similar to values in the outer Pelorus Sound (1.8–4.6 mm yr^{-1}, Handley et al. 2017) over the last century, and within the range of values measured in North Island estuaries (2.3–5.5 mm yr^{-1}).

47. **Sources of marine sediment deposits**: Once sediment from the Kaituna and Pelorus Rivers enters Pelorus Sound, it becomes mixed with marine 'legacy' sediment already in the system.

[21] See Table L-1, P179, Swales et al. 2021.
[22] See Figure A1, P19, Swales et al. 2021.

48. **Marine sediment:** This marine sediment, comprises approximately 70% by proportion of the total sediment accumulating in Mahau Sound, and has a unique isotopically enriched signature (see Figure 4, Appendix 2). This sediment was referred to as "Havelock inflow" in the previous Handley et al. (2017)[2] Pelorus sediment study. The consistent and uniform nature of this marine source contribution over time is notable.

49. **Subsoils** were the largest contributor of catchment-derived sediment deposited in Mahau Sound over the last ~century, averaging 14% to 17% of the total sedimentation across the three core sites (see Figure 4, Appendix 2). The land uses associated with these subsoils cannot be determined using the isotopic values of the FA biotracers. Subsoils are likely to be derived from steepland areas after removal of forest canopy and topsoils. Potential subsoil sources also include cutting for roads and tracks and side casting material, with bare or sparse vegetation cover, where subsoils are exposed to surface erosion by rainfall and runoff, as well as landslides during high-intensity rainfall events.

50. **Streambank erosion** is the second largest source of catchment-derived sediment accumulating in Mahau Sound, accounting for 8% to 10% of the total (see Figure 4, Appendix 2).

51. **Native forest and harvested pine forest** (post-1979/1980) account for similarly small proportions of the sediment accumulation in Mahau Sound, averaging 1.8–2.3% of the total (see Figure 4, Appendix 2). Sediment contributions from Kanuka scrub average 1.3–1.5% and the Scrub and Pasture (combined sources) only 1.1–1.3%. Although these sources account for a relatively small proportion of the total (with marine source included), large differences in land use areas suggest that specific sediment yields differ markedly. Source proportions (%) normalised by the matching land use areas, LCDB-2 to -4) were used to calculate yields (% km^{-2}) for matching years in the cores. This enabled direct comparison of source yields for land uses relative to native forest.

52. The source proportion yields (% km^{-2}) for the disturbed catchment land uses

were normalised by the matching values (i.e., year and core) for the native forest (% km^{-2}) to enable direct comparisons of the source yields relative to native forest. The calculations of the average source proportion yield ratios relative to native forest are summarised in Table 2 (see Appendix 2).

53. The results from core data support the catchment data that shows sediment accumulating in the Mahau Sound since the early-1980s (i.e., the timing of first rotation pine harvest) when compared to native forest areas are disproportionately sourced from harvested pine areas.

CONCLUSIONS

54. Our results from analysis of sediments deposited in subcatchments, the outlet of the Pelorus River, and from sediment cores in Mahau Sound all demonstrated disproportionate contribution of sediment from harvested pine cover, as compared to equivalent land areas under other land uses or native vegetation.

55. A recurring theme underlying the increase in the sediment accumulation rates over the past century is that clear-felling and uniformity in land use exacerbates sediment loads delivered to waterways.

56. Increased sediment inputs can profoundly alter the structure and function of estuarine ecosystems and reduce their values, with event size and frequency both affecting the time it takes for coastal and estuarine habitats to recover[23]. Repeated deposition of thinner layers of fine sediment as little as 3 mm has been shown to do more damage than single small events causing alterations to macrobenthic community structure[24]. However, catastrophic loss of marine resident fauna has also been measured after being smothered by 2 cm of terrestrial sediment with fauna failing to recover completely for experiments lasting 212–603 days[23]. With the expected increase in rainfall and return times

[23] Thrush, S.; Hewitt, J.; Cummings, V.; Ellis, J.; Hatton, C.; Lohrer, A.; Norkko, A. 2004. Muddy waters: elevating sediment input to coastal and estuarine habitats. Frontiers in Ecology and the Environment 2: 299-306.
[24] Lohrer, A.M.; Thrush, S.F.; Hewitt, J.E.; Berkenbusch, K.; Ahrens, M.; Cummings, V.J. 2004. Terrestrially derived sediment: Response of marine macrobenthic communities to thin terrigenous deposits. Marine Ecology Progress Series 273: 121-138.

of extreme rainfall events with Climate Change[25] both chronic effects from increased deposition of sediments and more-frequent catastrophic events will become more likely.

AFFIRMED at Nelson)
by **Sean Jeffrey Handley**)
this 24th day of January 2023) _____
before me)

_____
A solicitor of the High Court of New Zealand

[25] MfE. 2020. National Climate Change Risk Assessment for Aotearoa New Zealand: Main report – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Pūrongo whakatōpū. p 133, Wellington: Ministry for the Environment.

APPENDIX 1: Explanation box, from P.61, Swales et al. (2021)

Explanation:

To identify where excessive soil erosion is occurring in a catchment, a reference value is used that quantifies the expected average rate of erosion in each sub-catchment. In this study, we have used mean annual specific sediment yields (SSY) provided by NZ River Maps (NZRM, Booker and Whitehead, 2017). NZRM incorporates SSY estimates from Hicks et al. (2011) erosion terrain model that is underpinned by sediment yield data from 233 New Zealand catchments. These data include measurements from the Bryants hydrometric station (site 58902) located in the Pelorus Catchment (Hicks et al. 2011). This mean annual SSY estimate is based on a multi-variable statistical analysis, that incorporates drivers (rainfall and runoff) and supply factors, related to geology, soils, erosion processes and slope. Land cover and climate variability are not explicitly included in the erosion terrain model. The CSSI sediment-tracing technique provides an estimate of SSY for each sub-catchment that is independent of the multi-variate NZ River Maps model. The CSSI-based SSY also represents a recent time period prior to sampling whereas the NZRM SSY represents a long-term average value. These two independent SSY estimates can then be compared as ratios (i.e., SSY_{CSSI}/SSY_{NZRM}).

Interpretation:

An SSY ratio of unity (i.e., 1) means that SSY values determined by both methods are identical and indicates that there is no excessive erosion in that catchment. A ratio higher than unity indicates that excessive erosion is occurring in the catchment during the time period when the sampled river sediment was deposited. The magnitude of the SSY ratio greater than unity indicates how excessive the erosion rate is. This information can be used to identify erosion hot spots where: (1) the SSY ratio moderately exceeds an expected range and further investigations maybe required, or (2) implementing soil conservation measures where the SSY ratio substantially exceeds the expected range (see examples below).

Examples: an SSY ratio of 1.5 means soil erosion is producing 1.5 times as much sediment as expected relative to the mean annual SSY value calculated by NZ River Maps. This maybe within the SSY range "expected" for a steepland catchment. The expected range may have been set at (for example) 1-2 times the mean annual value. Consequently, catchment management can focus on the hot spots with ratios substantially greater than an expected range that recognises some level of year-to-year variability associated with climate. In this study, SSY ratios as high as ~22 are an order of magnitude higher than the mean annual value and can reasonably be considered to be excessive. Conversely, there are SSY ratios less than 1, which indicates that those subcatchments are producing less sediment than expected relative to the mean annual value.

APPENDIX 2: FIGURES AND TABLES

FIGURE 1:

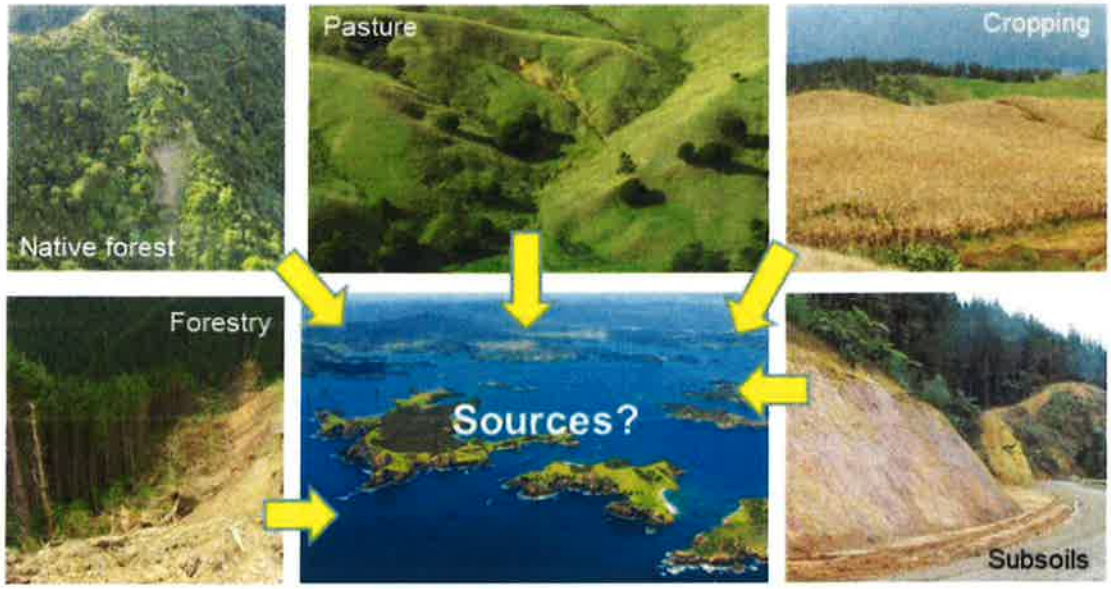

Figure 2-1: CSSI sediment source tracing. A sediment-tracing method based on the concept of compound specific stable isotope (CSSI) signatures of fatty-acid (FA) soil biomarkers that are produced by plants. The isotopic signatures of these biomarkers can be used to identify different plant communities (i.e., land use).

TABLE 1:

Table 1-1: Present-day catchment land use in the Pelorus, Rai and Kaituna catchments. Source: LCDB-5 (2018) with areas for the most common land uses by area shown. Note: indigenous forest (LCDB classification) is referred to as native forest in this report.

Land use	Pelorus (Area, km^2)	Rai (Area, km^2)	Kaituna (Area, km^2)
Indigenous Forest	527.20	112.36	47.07
Broadleaved Indigenous Hardwoods	20.55	8.76	10.04
Manuka and/or Kanuka	9.10	2.09	8.24
Exotic Forest	59.78	31.58	28.68
Exotic Forest – Harvested	11.65	4.00	0.81
High-producing exotic grassland	29.81	45.93	2.09
Low-producing exotic grassland	3.16	1.07	46.01
Gorse and/or Broom	4.12	4.22	0.60
Fernland	0.63	0.15	1.70
Total areas	665.89	210.16	145.24

FIGURE 2:

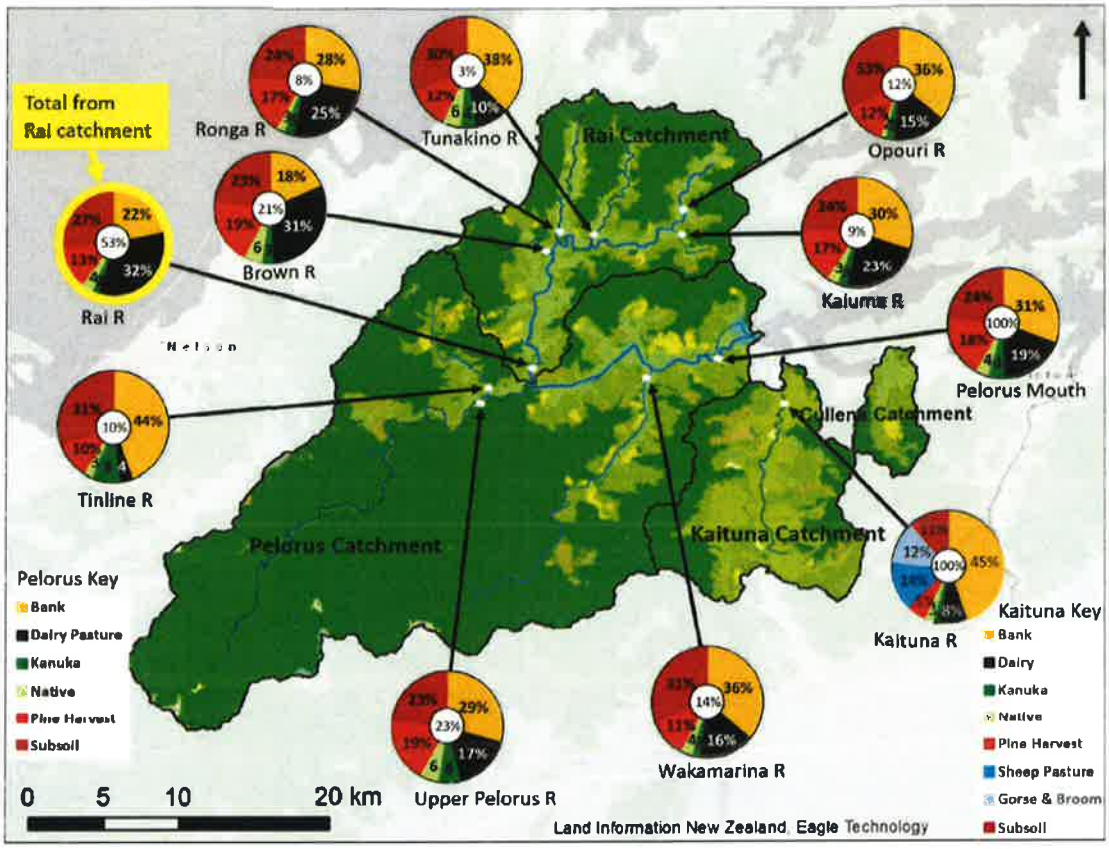

Figure 4-1: Sources of sediment by land use deposited at confluences and contributions (%) from major tributaries in the Pelorus-Rai and Kaituna catchments. The % soil proportions in the centre of each pie chart indicate the contribution of that subcatchment to sediment deposition in the river system (i.e., 100% at the catchment outlet). Data for river sediment collected in April 2016 and May 2018.

FIGURE 3:

Figure 4-2: Examples of understory plant communities in (a) native forest, and (b) mature pine forest.

FIGURE 4:

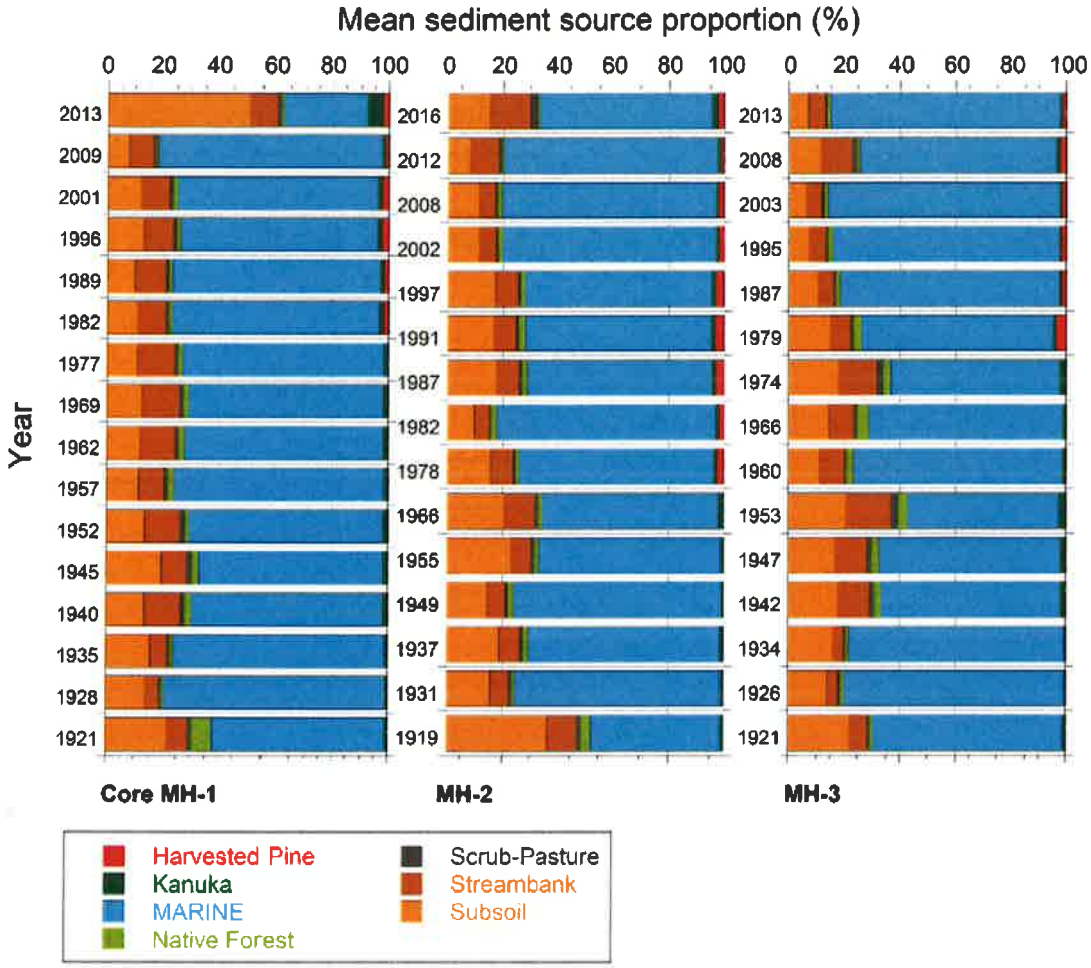

Figure 3-10: All sources of sediment accumulating in Mahau Sound (Inner Pelorus) since the early 20th century determined from CSSI analysis of dated cores. Data shown are the mean sediment source proportions calculated from a probability distribution (n = 3000) generated by the MixSIAR mixing model using the source library.

TABLE 2:

Table 3-8: Source proportion yields (% km $^{-2}$) for land use classes and yield ratios relative to native forest based on Land Cover Data Base (LCDB) versions 2 to 4. Source proportion data (%) provided for each core. Land use areas are based on values for the entire land catchment of Pelorus Sound. Source proportion yields provided for mean and credible interval values (2.5%, 97.5%) for the modelled % soil proportion distribution.

LCDB Class	LCDB version Year	Core	Land use class area (km^2)	Source Proportion yield by area (% km^{-2})			Yield ratio relative to Native Forest		
				Mean	2.5%	97.5%	Mean	2.5%	97.5%
Harvested Forest	2012/13	MH-1	25.9	0.0772	0.0012	0.4367	65.6	54.5	74.2
		MH-2		0.0463	0.0012	0.1617	48.1	54.2	45.8
		MH-3		0.0502	0.0015	0.1601	39.1	48.1	38.2
		Average					51.0	52.3	52.7
	2008/09	MH-1	17.7	0.0679	0.0022	0.2349	106.0	137.1	96.9
		MH-2		0.1132	0.0028	0.3578	58.9	66.2	57.1
		MH-3		0.1132	0.0045	0.3437	75.7	96.7	64.9
		Average					80.2	100.0	72.9
	2001/02	MH-1	11.4	0.2019	0.0070	0.5711	118.1	164.2	92.5
		MH-2		0.1842	0.0053	0.5632	101.4	98.5	89.8
		MH-3		0.1316	0.0035	0.4000	77.0	65.7	74.4
		Average					98.8	109.5	85.6
Manuka/Kanuka	2012/13	MH-1	125.9	0.0445	0.0001	0.2374	37.8	6.0	40.3
		MH-2		0.0087	0.0003	0.0319	9.1	14.9	9.0
		MH-3		0.0064	0.0002	0.0222	5.0	5.0	5.3
		Average					17.3	8.6	18.2
	2008/09	MH-1	127.2	0.0079	0.0002	0.0283	12.3	13.7	11.7
		MH-2		0.0071	0.0002	0.0259	3.7	3.8	4.1
		MH-3		0.0126	0.0004	0.0432	8.4	8.2	8.1
		Average					8.1	8.6	8.0
	2001/02	MH-1	130.1	0.0123	0.0003	0.0415	7.2	6.9	6.7
		MH-2		0.0069	0.0002	0.0244	3.8	2.9	3.9
		MH-3		0.0054	0.0001	0.0193	3.1	2.3	3.6
		Average					4.7	4.0	4.7

TABLE 2: ***cont.***

LCDB Class	LCDB version Year	Core	Land use class area (km^2)	Source Proportion yield by area (% km^{-2})			Yield ratio relative to Native Forest		
				Mean	2.5%	97.5%	Mean	2.5%	97.5%
Native Forest	2012/13	MH-1	935.8	0.0012	0.0000	0.0059	–	–	–
		MH-2		0.0010	0.0000	0.0035	–	–	–
		MH-3		0.0013	0.0000	0.0042	–	–	–
	2008/09	MH-1	935.9	0.0006	0.0000	0.0024	–	–	–
		MH-2		0.0019	0.0000	0.0063	–	–	–
		MH-3		0.0015	0.0000	0.0053	–	–	–
	2001/02	MH-1	935.9	0.0017	0.0000	0.0062	–	–	–
		MH-2		0.0018	0.0001	0.0063	–	–	–
		MH-3		0.0017	0.0001	0.0054	–	–	–

Attachment 8

Affidavit of Gary Vernon Taylor on behalf of EDS

BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH

ENV-2023-CHC-

TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHI ROHE

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	an application for declarations under Part 12 of the Act
BETWEEN	**ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

AFFIDAVIT OF GARY VERNON TAYLOR ON BEHALF OF ENVIRONMENTAL DEFENCE SOCIETY INCORPORATED IN SUPPORT OF APPLICATION FOR DECLARATIONS

AFFIRMED 2ND FEBRUARY ~~JANUARY~~ **2023**

Solicitor
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Ellis Gould
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I, Gary Vernon Taylor, of Auckland, affirm:

1. My full name is Gary Vernon Taylor. I am Chief Excutive Officer of the Environmental Defence Society Incorproated (EDS). I am authorised to provide this affidavit on behalf of EDS.

2. This affidavit is provided in relation to an application by EDS for declarations concerning the National Environmental Standards for Plantation Forestry (NES-PF) and the erosion susceptibility classification (ESC) that underpins the NES-PF.

3. EDS has extensive history acting as an environmental 'watchdog' in Aotearoa New Zealand. It regularly represents the environment before consent authorities and the Environment Court. Its focus is on protecting New Zealand's marine environment, biodiversity, freshwater resources, landscapes and natural character of the coastal environment. These all contribute to the wellbeing of people and communities.

4. EDS has been involved, either as appeallant or section 274 party, in a number of precedent setting resource management decisions, most notably, the Supreme Court decision of *Environmental Defence Society Incorproated v The New Zeland King Salmon Co Ltd*.[1]

EDS CONCERN WITH FORESTRY EFFECTS

5. EDS has been concerned about the significant adverse effects of sedimentation from plantation forestry activities and the permissive regulatory regime applying to those activities in the NES-PF for some time.

6. In 2019, in conjunction with Forest and Bird and forestry expert Dr David Hall, it produced a report called "*Review of the Resource Management (National Enviromental Standards for Plantation Forestry) Regulations 2017; Are the settings right to incentivise the "right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?*" (see **Annexure 1**).

[1] [2014] NZSC 38.

7. The report observed that:

   (a) In most circumstances, the adverse environmental impacts of clear-fell harvesting are significant.[2]

   (b) The NES-PF's presumption that plantation forestry activities should be a permitted activity needs to be revisited.[3]

8. It recommended:

   (a) That the activity status of harvesting in orange zoned land be changed to provide for regulatory oversight.[4]

   (b) That clear-fell harvesting in all orange (high risk erosion) zoned areas be a restricted discretionary activity at a minimum.[5]

9. Most recently, in the aftermath of Cyclone Hale and the significant adverse effects from plantation forestry slash and sediment on downstream receiving environments, EDS called for a Commission of Inquiry or more accurately a Public Inquiry under the Inquiries Act 2013 into the forestry sector, including a review of its regulatory regime (see **Annexures 2 and 3**).

REVIEW OF THE NES-PF

10. In 2021, Te Uru Rākau, the Government's forestry agency, prepared a report for Forestry Ministers on the NES-PF called "*Report on the Year One Review of the National Environmental Standards for Plantation Forestry*"[6] (see **Annexure 4**). With

---

[2] Gepp, Hall and Wright, 2019, *Review of the Resource Management (National Enviromental Standards for Plantation Forestry) Regulations 2017; Are the settings right to incentivise the "right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?, EDS and Forest and Bird,* pg 2.

[3] Gepp, Hall and Wright, 2019, *Review of the Resource Management (National Enviromental Standards for Plantation Forestry) Regulations 2017; Are the settings right to incentivise the "right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?, EDS and Forest and Bird,* pg 2.

[4] Gepp, Hall and Wright, 2019, *Review of the Resource Management (National Enviromental Standards for Plantation Forestry) Regulations 2017; Are the settings right to incentivise the "right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?, EDS and Forest and Bird,* pg 24.

[5] Gepp, Hall and Wright, 2019, *Review of the Resource Management (National Enviromental Standards for Plantation Forestry) Regulations 2017; Are the settings right to incentivise the "right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?, EDS and Forest and Bird,* pg 26.

[6] Te Uru Rākau, 2021, *Report on the Year One Review of the National Environmental Standards for Plantation Forestry*, Te Uru Rākau.

respect to the ESC, the Report found that:[7]

(a) The ESC is being applied at a scale that is not accurate enough for site-specific assessments; and

(b) Some regions have questioned the accuracy of the ESC.

11. The affidavits of Mark Bloomberg and James Griffiths describe these issues in further detail.

12. Partly in response to the Year One Review, and partly in response to the growth of carbon forests (i.e., permanent forests), the Government is currently reviewing the NES-PF. The scope of that review does not include the permitted activity regime applying to harvesting activities on orange (high erosion risk) land.[8] Nor does it address the issues raised in the Year One Review relating to the ESC.

PERMITTED FORESTRY ACTIVITIES IN MARLBOROUGH DISTRICT

13. EDS's concern about the significant adverse effects of sedimentation from plantation forestry activities is not limited to Marlborough. Significant adverse effects on downstream receiving environments as a result of forestry activities occurs in other areas of the country. However, EDS has focused its declarations on Marlborough because:

(a) The Marlborough Sounds supports marine areas of high biological importance (see Mr Davidson's affidavit).

(b) The Marlborough Sounds' marine environment is greatly influenced by sediment arriving from catchments (see Mr Davidson's affidavit).

(c) There are multiple investigations that document the significant adverse effect sediment and sedimentation events have on the marine biology of the Marlborough Sounds (see Mr Davidson's affidavit).

(d) The Marlborough Sounds comprise partially submerged, unglaciated river valleys with steep topography and highly erodible soils (see Dr Handley's affidavit).

---

[7] Te Uru Rākau, *Report on the Year One Review of the National Environmental Standards for Plantation Forestry*, 2021, Te Uru Rākau, p 56-57.

[8] https://www.mpi.govt.nz/consultations/national-direction-for-plantation-and-exotic-carbon-afforestation?gclid=Cj0KCQiAq5meBhCyARIsAJrtdr6OJ0oYwQzvCDvuqTF6x7pVbQBPlOy9Te2b6v83NdLPnZGxLKzHKE8aAmlEALw_wcB

(e) NIWA has undertaken studies in the Marlborough Sounds demonstrating the disproportionate contribution of sediment to the marine environment from harvested pine cover, as compared to equivalent land areas under other land uses or native vegetation (see Dr Handley's affidavit).

(f) Over three quarters of forestry NES-PF activities are undertaken as permitted activities in Marlborough (see below).

(g) Marlborough has a significant amount of forestry occurring on orange ESC land (see Mr Bloomberg's affidavit).

(h) Marlborough is subject to frequent landslide triggering rainfall events, including on orange ESC land (see Mr Bloomberg's affidavit).

14. In preparation for these declaration proceedings, EDS made a number of information requests from Marlborough District Council (MDC). Specifically, EDS asked:

> "*Since the notification [of the NES-PF] was introduced, how many activities under the NESPF have been approved by MDC annually and how many forestry resource consents have been approved annually*?"

15. EDS asked for this information to get an understanding of the proportion of forestry activities occurring in Marlborough district as permitted activities under the NES-PF, as opposed to requiring resource consent.

16. MDC responded as follows:

> "*Number of NES-PF notifications – 2018 – 63; 2019 – 80; 2020 – 74; 2021 – 89; 2022 – 7*
>
> *Forestry resource consents granted – 2018 – 13; 2019 – 9; 2020 – 17; 2021 – 15; 2022 – 4*"

17. Annexure **5** sets out this exchange.

18. The information provided shows that, as of 14 April 2022 (when the information was provided to EDS):

(a) There have been 371 forestry activities approved by MDC as permitted activities (no consent was required) and 58 resource consents granted for forestry

activities.

(b) Approximately 84% of forestry activities notified to MDC are, therefore, permitted activities.

19. This confirms that the majority of forestry activities being undertaken in Marlborough district are doing so as permitted activities.

AFFIRMED at Auckland)

by **Gary Vernon Taylor**)

this 2nd day of ~~January~~ FEBRUARY 2023)

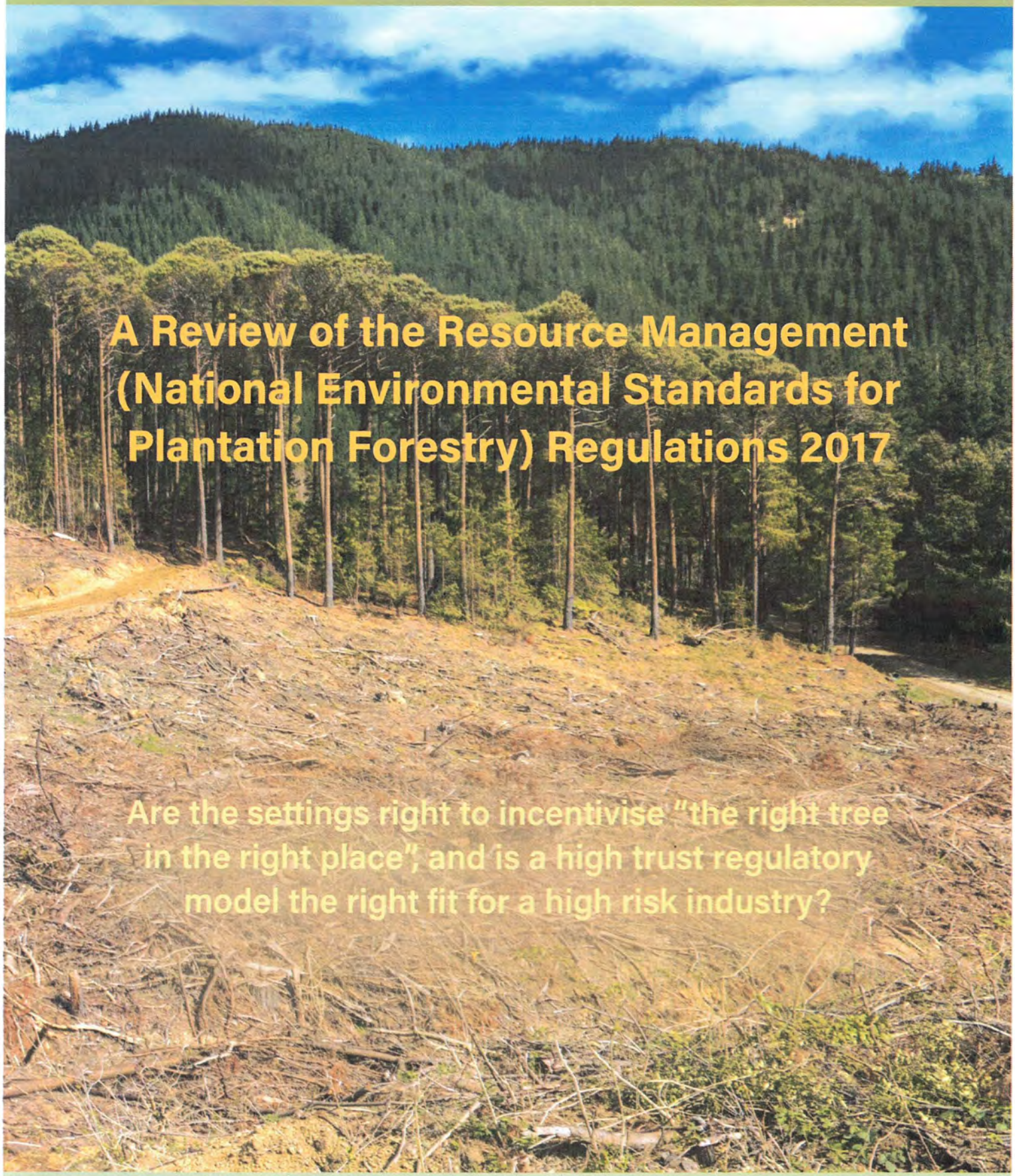
before me:)

A Solicitor of the High Court of New Zealand

Francis Kevin McEntee
Solicitor
Auckland

Annexure 1

Environmental Defence Society Inc and
Royal New Zealand Forest & Bird Protection Society of New Zealand



A Review of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

Are the settings right to incentivise "the right tree in the right place", and is a high trust regulatory model the right fit for a high risk industry?

Madeleine Wright, Sally Gepp and David Hall

Forest & Bird
TE REO O TE TAIAO | Giving Nature a Voice

EDS
ENVIRONMENTAL DEFENCE SOCIETY

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CONTENTS

ABBREVIATIONS

ESC	Erosion Susceptibility Calculator
ETS	Emissions Trading Scheme
FSC	Forestry Stewardship Council
LUC	land use capability
MPI	Ministry for Primary Industries
NES	National Environmental Standard
NESPF	Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017
NPS	National Policy Statement
NPSFM	National Policy Statement for Freshwater Management 2014 (as amended 2017)
NZCPS	New Zealand Coastal Policy Statement 2010
NZFFD	New Zealand Freshwater Fish Database
ONL	outstanding natural landscape
RMA	Resource Management Act 1991
SDGs	United Nations Sustainable Development Goals
SNA	significant natural area
WCC	Wilding Conifer Calculator

Ōpōtiki District

1 Introduction

PURPOSE

Planting trees is currently a live topic. The government has set a goal to plant one billion trees by 2028. While landscape-scale planting and restoration projects are increasing, water quality is getting worse, and sediment loss (which tree cover can prevent and tree removal exacerbates) is a key contributor. Aotearoa's unique biodiversity is in decline, and habitat loss continues. Climate change impacts are being increasingly felt, and emitters are looking for sequestration opportunities. Recent events in Tolaga Bay and Tasman, and the sediment issues in the Marlborough Sounds, have raised concerns about industry practice and the efficacy of management controls over plantation forestry.

We shouldn't just put trees in the ground without some forethought. Perverse outcomes are likely if we do, and so, the question is: How do we get the right tree, in the right place, for the right purpose?

Plantation forestry sits at the heart of this question. It presents a significant opportunity but also a significant risk if it isn't carefully located or managed well. The Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 (NESPF) are the key regulatory tool for managing plantation forestry, so getting this instrument right is crucial for ensuring plantation forestry in Aotearoa is done well.

The NESPF was gazetted on 3 August 2017 and came into force on 1 May 2018.[1] At that time the government committed to a review of the document within a year. That review is kicking off in early 2019, and it is that process, together with the perfect storm of interest drivers already outlined and the indicators that issues with interpretation and implementation were already cropping up, which prompted us to undertake this analysis.

This report is intended to feed into the government-led review of the NESPF, which may be at risk of failing to address critical issues due to overly narrow terms of reference. It is also intended to feed into government and public discussions on related topics. The purpose of this document is to explore the effectiveness of the NESPF and identify issues or gaps that are resulting in, or are likely to result in, confusion and complexity in interpretation and implementation; misalignment with other national policy initiatives and instruments; misalignment or missed opportunities in developing national climate change policy and emissions reduction targets; and adverse environmental effects. That analysis is difficult, partly because of the complexity of these issues, partly because of the complexity of the NESPF itself, and partly because the NESPF has only been operational for a short period of time.

As a result, this report does not capture all possible topics, or even all possible issues under the topics that are addressed. The short time period between the NESPF's coming into force and the writing of this report means it is not possible, in most instances, to examine its efficacy on the ground. That means this analysis is something of a desktop exercise, focusing on key issues identified through interviews, background research, statutory interpretation, and the authors' experiences. It is intended to be a constructive springboard for further discussion and work.

OVERARCHING OBSERVATIONS

Managing the environmental impacts of plantation forestry isn't easy. This complexity is revealed by the many recommendations under each topic in this report. Recommendations have been made in respect of each topic, so the specific issues and possible responses are clear. It is in this section that overall observations and recommendations are made that tie these topic-specific responses together.

The first is that **the NESPF's approach to afforestation and replanting is too permissive and needs to be re-examined. Greater stringency needs to be applied.**

With many existing plantations nearing point of harvesting and the government's push to get trees in the ground, we need to make sure that decisions about where plantation forests are located and what trees are planted are subject to careful and strategic thought. Planning to identify significant environmental values or risks should be occurring *before* planting, not at the point of harvesting or on an ad hoc basis when a certain operational activity needs to occur. This goes for new plantation forests and new rotations at existing sites.

The current NESPF simply does not provide for that level of care and precision.

For example, afforestation and replanting in green-, yellow- and orange-zoned land is permitted, despite many orange-zoned and some yellow-zoned land areas being at high risk of erosion (see the 'Erosion' section). In red-zoned land both are permitted provided the area is less than 2ha in a calendar year. The question needs to be asked: Should trees that are planted specifically for removal be put in these areas? They might provide some stabilisation benefits but those are short-term and the erosion and sediment discharge that will follow on harvesting will be significant, even from smaller areas. The government's planting programme anticipates a significant portion of permanent forest, and areas where risk of adverse environmental effects from tree removal is high should be targeted. The NESPF needs to provide a robust and clear regulatory framework that is consistent with that approach.

Similarly, the NESPF's setback provisions are inadequate. These are either set at a distance for which there is no ecological justification (5m), or at a distance (10m) which, in light of damage that occurs during harvesting, will effectively be halved. This means they, too, are ecologically questionable. The provisions also only apply to a portion of water bodies, either because of size restrictions (eg wetlands) or due to exclusion altogether (eg ephemeral streams). Setback requirements at the point of afforestation and replant are critical because once a tree is in the ground it will likely be removed, meaning impacts are inevitable.

Direction around what trees can be planted is also weak. For example, a requirement to obtain resource consent is only triggered if the Wilding Conifer Calculator (WCC) gives an area a rating of 12 or 'high risk.' This is despite a 10 or 11 rating still being 'relatively high risk.' In addition, replanting the same species is permitted no matter what species was used originally, meaning that wilding conifer spread can be perpetuated on replant.

Greater stringency and careful and strategic planning at the time of afforestation and replanting could allow for more leniency during operation.

The second overarching observation is that **the NESPF's presumption that plantation forestry activities should be a permitted activity needs to be revisited.**

A complex, intensive activity that not only has immediate impacts but contributes to diffuse pollutants does not easily lend itself to the certainty and specificity required for a permitted activity standard of national application. This is particularly so when that activity occurs across a national landscape that is extremely diverse and which, in many areas, is reaching environmental limits.

The result of taking a permitted activity approach is the use of permitted standards which are either inadequate to achieve the necessary level of environmental protection in all situations, or are uncertain and subject to a value judgement. They are therefore difficult to implement or enforce.

Using management plans that cannot be certified or rejected relies heavily on foresters designing adequate management plans and complying with vague permitted standards. This is a very 'high trust' model, which may not be warranted given the seriousness of potential environmental impacts, variability in practice around the country, and poor compliance outcomes in some areas.[2]

Finding the answer is not easy. National direction has its advantages, but it only works if national standards are set at a point which will ensure protection of all environments. Failure to do that will see continued loss of, and ongoing cumulative impacts on, some of our already threatened ecosystems and biodiversity – like wetlands or estuaries. Council oversight via resource consent has its advantages in allowing site-specific assessment of risks and development of site-specific management responses. However, it isn't a silver bullet, as council rigour in approaching these types of issues is variable around the country.

The answer likely lies somewhere in the middle, with increased nuance in how plantation forestry activities (particularly harvesting) are controlled in different areas and near different, sensitive environments. Under the current NESPF, plantation forestry may end up permitted in some areas and subject to a resource consent requirement in others; however, the balance between those two tools will need to shift if the issues associated with the current approach are to be addressed. The activity status that should apply will require thought. If all potential effects are known, then restricted discretionary status is appropriate. If not, then discretionary activity status should apply. In areas where plantation forestry is not desirable, non-complying or prohibited status should be used.

In some circumstances Forestry Stewardship Council (FSC) standards provide a higher level of environmental protection and could provide guidance for improved regulatory standards in the NESPF.

The third and final overarching observation is that, **in most instances, the adverse environmental impacts of clear-fell harvesting are significant. Therefore policy needs to be developed to facilitate a transition to more sustainable methods** such as continuous cover forestry and other silviculture techniques.

In respect of many of the issues discussed in this report, the issue isn't harvesting per se. It is *how* we are harvesting. Alternative methods, like continuous cover forestry, have a whole range of benefits (eg in relation to erosion, biodiversity and water quality). This is how

plantation forestry is now undertaken in many other countries. Research needs to be carried out to examine how those methods can be applied here, and what is required to make a transition in harvesting method commercially viable for New Zealand foresters. This research needs to include implementation of alternative methods and the creation of demonstration sites to allow for rigorous analysis of outcomes.

SOCIAL, ECONOMIC, AND ENVIRONMENTAL CONTEXT

Before human settlement, much of Aotearoa was covered in indigenous forest and shrublands. Clearance began with arrival of Māori, and accelerated with the arrival of European settlers. Indigenous forest was cleared to make way for farming, and timber was used for construction. Deforestation of indigenous forest was rapid, and in the early 1900s the government introduced incentives to create plantation forests of important species.

Today, forests cover 31% of our land surface, about 6.5% (1.70 million ha) of which are plantations of mainly exotic species, mostly *Pinus radiata*.[3] Plantation forests are distributed across the country.

In 2016/2017 the value of forest product exports was $5.47 billion, and the total contribution of the forest industry to GDP was $3.55 billion. In 2016 the number of forestry workers was approximately 11,000.[4] The sector is party to numerous Accords ranging from social to environmental matters, and is also able to become certified under the FSC certification scheme. This involves uptake of several detailed environmental management requirements.

Plantation forests have a number of environmental benefits. Trees play a stabilisation role, especially on erosion prone land, protecting soil and regulating the rate at which water and collected sediment can run off the land into fresh and coastal water. The "*vegetative litter on the forest floor also acts as a sponge – holding and slowly releasing water for many days after the last rainfall*",[5] which assists with flood and sediment mitigation. Tree cover along rivers and streams also provides shading to assist with temperature regulation.

Plantation trees also make a significant contribution to carbon sequestration, with the New Zealand exotic forest biomass carbon estimated at 283 million tonnes in 2015 (an increase of 150 million tonnes or 114% since 1990). If carbon of the exotic forest soil is included, the total biomass carbon volume is 451 million tonnes in the same period, an increase of 189 million tonnes, or 72%.[6] Under conventional carbon accounting rules, however, sequestered carbon is deemed to be mostly released on harvesting, thus the carbon sequestration benefits are only temporary, either restored if the site is replanted or lost indefinitely if the site is converted to a non-forest land use.

Plantation forests also play a role in mitigating historical indigenous deforestation, providing habitat for some indigenous fauna and the canopy cover required for growth of some indigenous understorey flora. Indigenous understorey consists mainly of vascular plants which can make up a significant part of the total understorey vegetation, such as in Kinleith Forest where the proportion of indigenous plants in the understorey of a 29-year-old stand was found to be 82%.[7]

Plantation forests can also play an important role in providing connectivity between indigenous forest remnants, and ecological buffers from adjacent non-forest land uses. A total of 118 threatened species have been recorded or observed within plantation estates, some in exotic stands and others in managed indigenous forest remnants, wetlands, and frost flats.[8] These include lizards, frogs, invertebrates, long-tailed bats, and numerous indigenous birds including the north brown kiwi (At Risk-Declining), the great spotted kiwi (Threatened-Nationally Vulnerable), and three ecologically distinct forms of kārearea (the southern form is Threatened-Nationally Vulnerable; the bush and eastern forms are At Risk-Recovering). Some operations, such as Omataroa and Te Teko, actively manage potential impacts on indigenous fauna.

However, realising these positive effects often depends on good management practice. Many benefits are only temporary and are lost during harvesting. This is particularly so when clear-fell harvesting methods are used, as is typical in Aotearoa.

Indigenous understorey and associated fauna habitat are lost on harvesting, as is habitat provided by the plantation trees themselves. Indigenous fauna can also be harmed or killed. Some of the species impacted may also be taonga, adding a cultural element of concern.

Indigenous flora and fauna can also be lost through the establishment of plantations at the expense of original indigenous habitat. Fortunately, this is no longer widespread, although issues still arise with the establishment of exotic plantations in indigenous shrublands and grasslands (eg in Otago and Marlborough).

Just as plantation forestry can assist with mitigating erosion and sediment, it can also contribute to it. Sedimentation associated with forestry activities can have significant impacts on freshwater and coastal ecosystems. This is particularly the case immediately after harvesting, especially when clear-felled, and during the seven year 'window of vulnerability' when neither the roots of harvested trees nor the roots of replanted trees are capable of stabilising soil. However, it is also an issue prior to harvesting in respect of roads, vehicle crossings, and forestry activities in steep areas (especially those with soft soils) like the Marlborough Sounds or in Gisborne.

Deposited sediment smothers benthic habitats. Suspended sediment smothers the feeding and gill structures of invertebrates and fish, is known to reduce fish diversity, reduces fish feeding ability, and "*disrupts the natural primary productivity base of the food chain in both freshwater and estuarine ecosystems*".[9] Forestry operations and harvesting can cause damage to riparian zones and wetlands, both to the ground structure and through loss of vegetation. Planting of exotic species, in particular *Pinus radiata,* in direct proximity to smaller streams and wetlands

can have significant impacts through water yield, with moisture taken from the stream or wetland and absorbed by the surrounding trees.

Similar issues to those resulting from sediment arise with slash movement, which can cause significant physical damage to habitat in the direct vicinity and in downstream environments, including the coastal marine area.

The spread of exotic trees outside the plantation site (wilding conifers) is another significant environmental issue. Wilding conifers are invasive weeds which constitute a significant economic, environmental, and cultural threat in many parts of Aotearoa. They are a major threat to non-forested indigenous ecosystems such as mineral belts and tussock grasslands, where they can modify the natural ecosystems to the point that indigenous species are lost. In indigenous forests, wilding conifers compete for space with indigenous trees and plants and discourage regeneration of the indigenous understorey. Wilding conifers also present a significant landscape risk, replacing indigenous species and unique geological formations, such as those of the Mackenzie Basin, with exotic monoculture.

Wildling pines, Mackenzie District

Whangapoua forest

2 A general outline: the current NESPF

NATIONAL ENVIRONMENTAL STANDARDS

National Environmental Standards (NESs) are one of the tools available to provide national direction on environmental management and resource use. The Resource Management Act 1991 (RMA) does not specify a purpose for NESs as it does for National Policy Statements (NPSs).[10] Instead, the purpose of a NES is effectively set by reference to scope and content: to set standards for specified resource management purposes that are to be nationally applied.[11]

The scope of what a NES can cover is wide. It can prescribe technical standards, methods, or requirements for: [12]

- Any of the matters referred to in ss 9, 11, 12, 13, 14 or 15 of the RMA, including but not limited to contaminants, water quality, water level, water flow, air quality, and soil quality in relation to discharge contaminants
- Noise
- Monitoring

Its standards may be qualitative or quantitative, relate to discharges, the ambient environment, or classification of resources, specify methods for implementation, or provide for exceptions or transitional steps.[13] A NES can prohibit an activity, require resource consent (including the parameters of that requirement) or permit an activity.[14] A NES must not permit an activity if that activity has significant adverse effects on the environment.[15]

A regional or district plan can only have a rule or rules that are more stringent or more lenient than a NES if the NES says so.[16] Such plans are also able to address the effects of activities subject to a NES where the effect is not dealt with by the NES and where the NES either "*allows an activity and states that resource consent is not required*" or "*states that the activity is a permitted activity*".[17] In that situation a regional or district plan may include permitted activity controls over and above those of the relevant NES to address those effects. On its face, it does not appear that s 43A(5) of the RMA provides regional and district plans the ability to address the effects of activities controlled by a NES if the NES classifies the activity as anything other than permitted,[18] or to control those effects using anything other than permitted standards.[19] However, breach of a permitted standard does mean that resource consent is required.

As a document made under the RMA, a NES must also align with the purpose of the RMA: to promote the sustainable management of natural and physical resources.[20] The Minister, when recommending the making of a NES to the Governor-General, must "*recognise and provide for*" the matters of national importance in s 6 of the RMA, have "*particular regard to*" the matters in s 7, and "*take into account*" the principles of Te Tiriti o Waitangi pursuant to s 8. The relationship between NESs, NPSs and the New Zealand Coastal Policy Statement 2010 (NZCPS) is not expressly described, but as the NZCPS (and, by analogy, any NPS) "*gives substance to*"[21] Part 2 of the RMA[22] in the environment they relate to, NESs could be expected to be consistent with NPSs.

RESOURCE MANAGEMENT (NATIONAL ENVIRONMENTAL STANDARDS FOR PLANTATION FORESTRY) REGULATIONS 2017

As noted above, the NESPF was published on 3 August 2017 and came into force on 1 May 2018. The objectives sought to be achieved by developing the NESPF were to:

- Maintain or improve the environmental outcomes associated with plantation forestry activities
- Increase the efficiency and certainty of managing plantation forestry activities

Those objectives are not set out in the NESPF itself.

The reason given by central government for developing the NESPF was to address difficulties for forest owners

arising from managing forests that straddled the boundary between two regions or districts, in which different planning rules applied. Some difficulties identified included increased costs and uncertainty about the plan rules that must be followed.

The NESPF's underlying premise is that plantation forestry (establishment and operation) is a permitted activity subject to compliance with standards. Inability to meet the standards in the NESPF triggers a requirement to obtain resource consent. The NESPF is intended to "*provide standardised rules for managing the environmental effects of eight main plantation forestry activities ... [which] aim to codify good management practices in a pragmatic balance between national and locational direction*."[23]

Part 2 of the NESPF is split into nine subparts. The first eight cover the main plantation forestry activities, and the last covers an assortment of specifically identified effects:[24]

- Afforestation[25]
- Pruning and thinning to waste[26]
- Earthworks[27]
- River crossings[28]
- Forestry quarrying[29]
- Harvesting[30]
- Mechanical land preparation[31]
- Replanting[32]
- Ancillary activities (slash traps; indigenous vegetation clearance; non-indigenous vegetation clearance)
- General provisions (discharges; disturbance; diversions; noise and vibration; dust; indigenous bird nesting; fuel storage and refuelling)

Regional or district plan provisions may be more stringent than the NESPF if necessary to:[33]

- Give effect to an objective developed to give effect to the National Policy Statement for Freshwater Management 2014 (as amended 2017) (NPSFM) or specified policies in the NZCPS
- Recognise and provide for the protection of outstanding natural landscapes (ONLs) or significant natural areas (SNAs)
- Manage specifically listed "*unique and sensitive environments*"

The NESPF does not allow regional and district plans to be more lenient than its standards.

The NESPF does not regulate every aspect of plantation forestry. Councils have discretion under s 43A(5) of the RMA to manage effects outside the scope of the NESPF. Effects that were recommended to be left outside its scope include the protection of sites of cultural significance and historic heritage (valued as matters of national importance under ss 6[e] and 6[f] of the RMA) and water yield.

The NESPF includes three risk assessment tools – the Erosion Susceptibility Calculator (ESC), the WCC, and the Fish Spawning Indicator – which are incorporated by reference. These are intended to enable location-specific risk assessments to be undertaken and to provide "*a more tailored approach to the management of adverse effects*" associated with erosion, wilding conifer spread, and fish spawning habitat.[34] Where a high risk of adverse environmental effects is identified under the risk assessment tools, resource consent is required.

Harvesting and earthworks, Havelock

Ōtuataua Stonefields

3 Māori cultural considerations

THE CURRENT NESPF: WHAT DOES IT SAY?

Consideration of Māori cultural issues in the NESPF is limited to papakāinga, defined as:[35]

> *a traditional layout of residential accommodation where dwellings are erected to exclusively house members of a whānau, hapū, or iwi, on land that is owned by the whānau, hapū, or iwi, and is Māori land within the meaning of section 4 of Te Ture Whenua Māori Act 1993 (including Māori customary land and Māori freehold land).*

The permitted activity standards for afforestation and forestry quarrying include a setback from the boundary of land zoned in a district plan as papakāinga.[36] Afforestation proposed within 30m of land zoned in a district plan as papakāinga triggers a requirement to obtain a restricted discretionary consent.[37] Similarly, forestry quarrying proposed within 500m of land zoned as papakāinga triggers a requirement to obtain a restricted discretionary consent.

The 'gap' relating to Māori sites of cultural significance was intentional. The Ministry for Primary Industries' (MPI) report on submissions on the draft NESPF and its 2017 NESPF s 32 RMA analysis both concluded that "*specific provisions in the NESPF to protect cultural and archaeological sites were not appropriate or practical at a national level*"[38] because "*the type and level of protection is often site specific and dependent on the values and sensitivities of the site and the knowledge and requirements of the local iwi*".[39] As a result, it was recommended that sites of cultural significance be left outside the scope of the NESPF, allowing regional and district councils to continue to manage effects of plantation forestry through plan provisions as the local context requires pursuant to s 43A(5) of the RMA.

However, there are overlaps between Māori sites of cultural significance and some of the specific areas in respect of which councils are afforded flexibility to apply greater stringency, such as:

- to give effect to an objective developed to give effect to the NPSFM; such an objective might, for example, relate to achieving Te Mana o Te Wai[40], mahinga kai[41], or a wāhi tapu site[42]
- to give effect to Policy 11 of the NZCPS, in particular Policy 11(1)(b)(iv) and the protection of "*habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes*"
- to give effect to Policy 15 of the NZCPS and recognise and provide for the protection of ONLs, given cultural and spiritual values are a component of landscape[43]

It would also be possible to provide for Māori cultural considerations through applying mātauranga and tikanga to the way in which effects are assessed in determining compliance with permitted standards, and as part of assessing resource consent applications.

DOES IT WORK?

The NESPF's approach has both positive and negative features.

On the positive side, it provides for a management approach and plan provisions that are tailored to the unique circumstances of a region or district. This responds directly to submissions received during consultation on the NESPF that a 'one size fits all' approach to managing impacts of plantation forestry activities on sites of cultural significance would not work due to significant national variability in identification, sensitivity, iwi or hapū concerns, and traditional management methods.

For example, as with ONLs and SNAs, some plans identify sites of cultural significance or taonga, but many do not. In some circumstances, identification is further complicated due to iwi or hapū reluctance to specifically identify sites due to fears they will be targeted for artefacts or destroyed because of concerns over potential restrictions associated with that status. In others, complications may arise due

to significance being tied to a specific occurrence such as a certain time of day or year. Management is similarly subject to local diversity, because the mātauranga and tikanga associated with managing and protecting sites of cultural significance are locally specific and borne out of generations of observation and practice.

However, relying on s 43A(5) of the RMA to provide flexibility for regional or district specific management of plantation forestry impacts on sites of cultural significance also has its problems.

First, there is a risk that if it is not provided for in the NESPF, it isn't provided for at all. The effectiveness of councils in engaging with and providing for cultural matters is variable around the country. In areas where the council has a strong working relationship with local iwi or hapū, it is more likely that rules will be developed to address the impacts of plantation forestry on sites of cultural significance. However, in areas where the relationship between the council and local iwi or hapū is weak, or where there are competing iwi or hapū interests, it is less likely (especially given the complexity and detailed analysis likely to be involved).

Secondly, the flexibility available to councils under s 43A(5) of the RMA is not absolute. On its face, s 43A(5) only provides councils with the ability to include permitted activity standards relating to cultural effects. This means that locations or effects need to be able to be articulated with the specificity and measurability required of a permitted activity standard. This may prove difficult given the issues already discussed (see the 'Structure and Language' section).

Thirdly, it is arguable that some sites of cultural significance are within scope of the NESPF and so recourse to s 43A(5) of the RMA to adopt a regional or district-specific approach is not available. For example, could a plan rely on s 43A(5) to include additional permitted standards relating to indigenous species habitat in the coastal environment that are sites of cultural significance when those areas are expressly covered by Policy 11 of the NZCPS (which is addressed by the NESPF)? Or could a plan include additional permitted standards relating to freshwater sites of cultural significance given cultural values are captured by the NPSFM (which is also addressed by the NESPF)? And if a site of cultural significance falls within a papakāinga area, is it within scope, given papakāinga are expressly captured by the NESPF?

Whichever position is taken (ie out of scope so full discretion, or inside scope with increased stringency), councils would have the ability to include controls specific to their region or district. However, legal uncertainty risks litigation over the lawfulness of proposed rules and could result in increased hesitancy by councils to incorporate rules to address effects on sites of cultural significance.

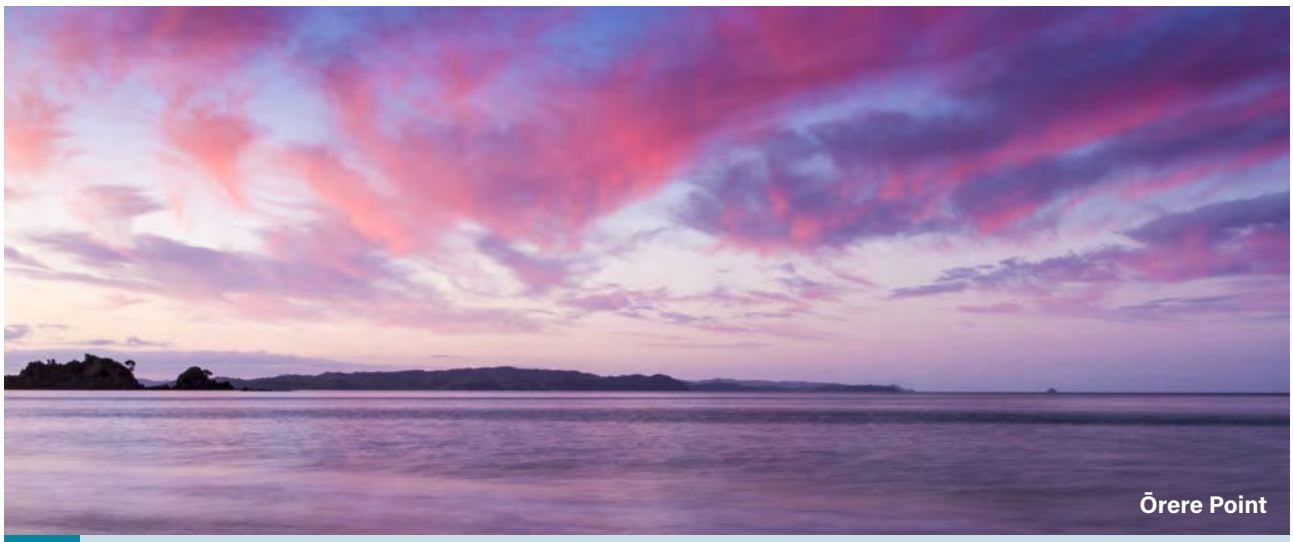
RECOMMENDATIONS

The level of complexity and local nuance associated with sites of cultural significance does not lend itself to a nationally ubiquitous approach. Providing for local flexibility in effects management is appropriate. The question – in light of the issues raised above – is whether excluding impacts on sites of cultural significance from the NESPF is the best method for achieving that. And if it is, what can be done to ensure exclusion is clear?

Recommendations to address the issues raised above are:

- Obtain feedback from regional and district councils on the development and implementation of provisions controlling the effects of plantation forestry on sites of cultural significance, including reasons for why provisions have or have not been developed and any difficulties faced.
- Obtain feedback from a cross-section of iwi and hapū on development and implementation within their rohe, including whether they think additional, specific management provisions are required, whether provisions have or have not been developed, and difficulties faced.
- Consider, taking into account the feedback received from the above steps, whether the NESPF should be amended to specifically state that the control of effects of plantation forestry on sites of cultural significance is outside scope of the NESPF, including when those sites overlap with an area/effect that is within scope.
- Consider what guidance and support measures can be developed for iwi, hapū, and councils for the identification and management of sites of cultural significance. This would likely have benefits that would extend past the NESPF.


Harataunga-Kennedy Bay



Ōrere Point

4 Climate change

THE CURRENT NESPF: WHAT DOES IT SAY?

Alignment with national climate change objectives is not an explicit outcome sought in the current NESPF. The regulatory framework of the RMA has not been seen as a tool for climate change mitigation; therefore, it is not surprising that the NESPF's objectives do not include carbon sequestration. However, the NESPF is relevant to Aotearoa's climate change strategy, given the major role of forestry (both commercial harvesting and permanent) in the government's strategy for meeting emission reduction targets.

The government recognises forestry as currently being New Zealand's most important source of short-term, domestic abatement as it can deliver carbon dioxide removals at a greater scale and lower cost than other domestic actions to reduce emissions.[44] The government's ambition for greater afforestation is currently being operationalised through the One Billion Trees Programme, changes to the Emissions Trading Scheme (ETS), and the drafting of the Zero Carbon Bill. The latter is designed to encourage afforestation and all other forms of abatement "*by providing a strong Government signal [for climate action], enduring laws and institutions, stable and predictable policy settings, and incentives for climate-friendly innovation and investment*".[45]

Insofar as the NESPF enables or hinders certain forestry activities, it may be aligned or misaligned with the government's abatement strategy. As a principle of joined-up policy-making, these (mis)alignments ought to be a matter of strategic consideration for the NESPF in the future.

DOES IT WORK?

Whether the NESPF is in alignment with climate change objectives depends on the framework for evaluating success. Alignment can be defined *narrowly* in terms of climate mitigation only, particularly with a focus on national net emissions, where all other considerations or potential impacts are put aside. Alternatively, alignment can be defined more *widely* in terms of climate change mitigation, adaptation, and broader sustainability outcomes such as those enshrined in the United Nations Sustainable Development Goals (SDGs) or in Part 2 of the RMA. These frameworks are discussed in turn.

Narrow alignment

For climate change mitigation in general (and, in particular, meeting Aotearoa's 2030 and 2050 emission reduction targets), the general principle is: the more forest the better. This principle also corresponds to the government's immediate priority for the One Billion Trees Programme.

On this narrow framing of success, the NESPF is climate-aligned only to the extent that it promotes afforestation and discourages deforestation by facilitating the replanting of sites or by limiting harvesting.[46] Tree species and forest management systems are only of subsidiary interest, insofar as they can optimise sequestration rates and increase total carbon stocks (although, as discussed below, choice of species and management system is important for climate adaptation and sustainability more broadly).

The promotion of afforestation is consistent with the original objective of the NESPF: to overcome "*the main problem ... [of] inconsistency in the management framework for plantation forestry*", which can result in "*re-litigation of the same issues across the country; inconsistent treatment of forestry operations; operational inefficiency; [and] investment uncertainty*".[47] If the NESPF has reduced this operational and investment uncertainty, and thereby encouraged forest land uses, then the maintenance and expansion of total forest carbon stocks can be included in the National Greenhouse Gas Inventory as negative emissions.

On this narrow alignment analysis, the question is whether the NESPF is facilitating land use change from exotic pasture into forestry, and discouraging decisions to shift permanently into a non-forest land use. Given that the NESPF has only been in place since 1 May 2018, it is too soon to verify whether these objectives are being fulfilled. Moreover, it will take some time for evidence to accumulate because of lead-in times required for forest planting.

Requiring resource consent for forestry activities may discourage them due to perceived time, cost, and uncertain outcomes from the consent process.[48] On a narrow alignment analysis, if this means that land remains in exotic pasture, then this outcome is misaligned with climate change mitigation objectives *unless* there are plans in place to establish non-plantation forest, such as "*long-term ecological restoration planting of forest species*", forest sinks for carbon farming, or plantation forestry managed as continuous cover forestry (see the 'Erosion' section).[49] The viability of non-plantation or non-clear-felled forestry depends on a range of factors (eg carbon price, cost of saplings, landowner aspirations) that are beyond the NESPF's remit; however, a joined-up approach to forest policy would ensure that the conditions are in place for non-plantation forestry to be viable when plantation forestry is not.

A further issue is the uneven distribution of regulatory burden across primary sector activities (henceforth, "sectoral inequity").[50] It is possible that, even for land where plantation forestry activities are permitted by the NESPF, its restrictions could disadvantage plantation forestry relative to other activities like pastoral agriculture, because the latter may not face equivalent restrictions. For example, the NESPF sets out the circumstances for which setbacks must occur, such as 10m setbacks from rivers wider than 3m, which reduces the potential productivity of that site. Such restrictions are defensible for environmental reasons (see the 'Fresh and Coastal Water' section); however, potential lack of comparable restrictions for pastoral agriculture means that the potential productivity for agricultural activities are higher for the same site. This sectoral inequity may be reduced over time, especially through the inclusion of controls in RMA plan provisions to control the water quality and biodiversity impacts of other land uses. Tools like setbacks are becoming more common for pastoral agriculture and development activities, and may become mandatory depending on changes to freshwater policy made in 2019. However, this issue points to the importance of a joined-up policy approach, which places the NESPF within its wider regulatory context (which also includes the ETS and other environmental regulation) and which indirectly influences land use choices in ways that may or may not align with climate change mitigation objectives.

Inequity does not only occur across primary sectors; it also occurs across forests of different sizes. For example, a 10m setback for a 200ha site would restrict forest activities on a relatively larger proportion of the total land area than for a 2000ha site. While there are good environmental reasons for setbacks, no matter what the scale of forest, it is important to note that they weigh heavier on small-scale foresters, thereby potentially discouraging forest activities that support climate change mitigation objectives. This is not only an issue for the NESPF, because the economics of small-scale forestry involve related hurdles, such as transport and harvesting costs that are relatively higher because of the smaller-scale yields. This also applies to seeking resource consents, which is more onerous for a small-scale forester compared to a large-scale corporate operator. From the climate change mitigation perspective this is problematic, as small-scale forestry plays an important role in establishing forests on sites that commercially driven operators might not consider because they are either too small, too remote, or too economically marginal.

Wide alignment

This section turns from *narrow alignment*, which focuses solely on mitigation outcomes, to *wide alignment*, which focuses on mitigation, adaptation, and sustainability more broadly. For simplicity's sake, we might conceive of sustainability by reference to the RMA's sustainable management purpose, or by reference to Goal 15 of the SDGs, which calls upon nations to manage forests sustainably, combat desertification, halt and reverse land degradation, and halt biodiversity loss. This wide alignment analysis is more consistent with the framing of the NESPF, which has policy objectives of "*facilitating the sustainable management of natural and physical resources*"[51] and "*maintain[ing] or improv[ing] the environmental outcomes associated with plantation forestry activities*".[52]

The first thing to note is that, by conceiving of climate action more widely, not only do we encounter a plurality of objectives, but also various internal trade-offs between them. For forestry, these trade-offs can be quite pronounced.

Consider, for example, the trade-offs between mitigation and adaptation as these relate to the choice of tree species and forest management systems. As noted above, a narrow focus on mitigation is concerned with species and systems *only* insofar as these optimise carbon sequestration rates. In Aotearoa, this tends to recommend *Pinus radiata*, which is fast growing in a range of circumstances, highly adaptable, and well understood by forestry operators. These qualities make this species attractive for plantation forestry, but also for carbon farming, because rapid growth corresponds to rapid carbon sequestration and, consequently, rapid accrual of carbon credits.

However, from an adaptation perspective, it is not clear that *Pinus radiata* monocultures are the optimal choice. Generally, diversity is the key to ecosystem resilience, both in terms of age and species diversity. Accordingly, even-aged, monoculture forests are generally regarded as more vulnerable to the impacts of extreme weather events such as drought, fire, and windthrow, as well as pests and diseases. Moreover, these risks multiply

as global mean temperatures increase, because of the increased incidence of extreme weather events. From the perspective of land resilience, *Pinus radiata* also has a disadvantage in that its roots rapidly decay after harvesting, so the soil-holding capacity of remaining roots is quickly lost. This means that clear-felled sites are vulnerable to erosion and sedimentation during this 'window of vulnerability', when new trees are yet to establish themselves. The choice of forest management system also has implications for land resilience. Clear-fell forestry leaves the land exposed to climatic impacts after harvesting, but continuous cover forestry has no window of vulnerability because a forest canopy cover is maintained continuously (see the 'Erosion' section).

Another consideration is the trade-off between climate mitigation and sustainability more generally. *Pinus radiata* is an exotic species and so is not aligned with the objective of restoring indigenous biodiversity. Moreover, while *Pinus radiata* may be an optimal choice for carbon farming, especially in the short term, there are questions over long-term sustainability, especially whether landowners would retain forest when it matures and ceases to generate carbon revenue, and whether large *Pinus radiata* forest sinks would have social licence among future generations. These tensions are captured by the idea of 'bio-perversities', which are defined as "*negative biodiversity and environmental outcomes arising from a narrow policy and management focus on single environmental problems without consideration of the broader ecological context*".[53] However, bio-perversity can cut both ways. Just as a narrow focus on climate change mitigation could be detrimental to biodiversity, so too could an overly narrow focus on biodiversity result in suboptimal outcomes by the exclusion of activities that deliver other environmental benefits, such as the use of exotic species for erosion control, carbon sequestration, or the providing of more immediate carbon benefits while simultaneously acting as a nursery for indigenous forest species that will ultimately take over.

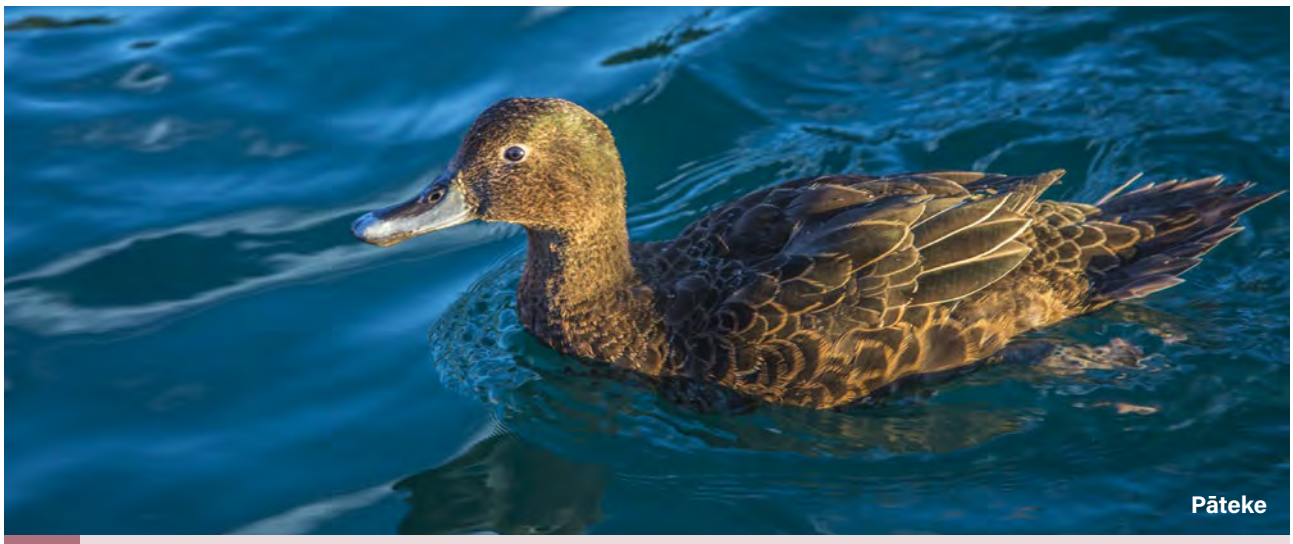
A further issue is wilding conifer spread. *Pinus radiata* has potential as a wilding conifer species, although this capacity is greater for other species such as *Pinus contorta* and Douglas fir. The spread of wilding conifers is commonly regarded as an environmental threat because of its implications for the integrity of SNAs, ONLs, visual amenity landscapes, natural character areas, sites of cultural significance, or the opportunity to preserve non-forest land uses such as high country farming (see the 'Wilding Conifers' section). On a narrow alignment analysis, the spread of wilding conifers could be seen as beneficial, because wilding conifers sequester carbon; however, on a wide alignment analysis, carbon sequestration is only one among a wider set of considerations about the environment's capacity to sustain itself. This wide analysis is more consistent with the broad sustainability objectives of the NESPF and Part 2 of the RMA.

Although, as noted, the RMA has not in practice been seen as a tool for climate change mitigation, s 70B of the Act specifically anticipates the development of NESs to "*control the effects on climate change of the discharge into air of greenhouses gases*". In that scenario, regional councils are able to make rules necessary to implement the standard. This potentially opens the door for the NESPF to address mitigation. However, this is not clear-cut, as s 70B relates specifically to a NES "*made to control the effects on climate change*", not one made for a different purpose (ie controlling forestry) which also happens to touch on climate change mitigation issues. What is clear is that there is an opportunity to address climate change-related discharges and mitigation via the RMA, including through the planting of trees. The inclusion of climate-related objectives in the NESPF or a separate but complementary NES would force the conversation on how to maximise environmental co-benefits, and where and when one objective should be preferred over another. It would, of course, add another layer of complexity, but this is a complex issue. It all comes back to the right tree, in the right place, for the right purpose.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

- Include the RMA and its subsidiary instruments (like the NESPF) within the remit of the national climate strategy process. Consider *inter alia* the role of the RMA (and subsidiary instruments) in that strategy and any necessary legislative amendment to allow it to fulfil that role.
- Given the increasing risks of massive forest loss as a result of climate change, consider the role that the NESPF might play in building the resilience of future forests, in line with best practice for climate adaptation. This might include the inclusion of firebreaks, rules on slash and residue management to reduce fire risk, tighter regulation of clonal forestry, species diversification, and climate-resilient management practices for thinning, fertilising, weeding, and pest control.[54] The importance of considering firebreaks is emphasised by the recent fires in Tasman.
- Undertake a national forestry strategy and/or a national land use strategy which includes, but is not limited to, the NESPF. This strategy ought to take a holistic view, not only assessing the effectiveness of regulatory instruments (eg the NESPF, ETS, forthcoming Zero Carbon Bill, and non-climate related environmental regulation like the NZCPS and NPSFM), but also the interactions between these instruments and various market factors, and the emergence of sectoral inequities for the land sector. Investigate options for reducing inequities and establishing ubiquitous, cross-cutting controls where appropriate, such as setbacks that apply equitably to competing land uses.



Pāteke

5 Indigenous biodiversity

THE CURRENT NESPF: WHAT DOES IT SAY?

The NESPF recognises that plantation forestry activities have the potential to adversely affect indigenous flora and fauna, and aims to address this by giving particular consideration to SNAs, controlling indigenous vegetation clearance, and requiring steps to be taken to reduce impacts on some bird species when nesting and freshwater fish species when spawning.

These controls are intended to implement the directions to decision-makers in s 6(c) of the RMA (to recognise and provide for the protection of significant indigenous vegetation and significant habitats of indigenous fauna), and in ss 30 and 31 (regarding maintenance of indigenous biodiversity, and maintenance and enhancement of ecosystems in water bodies and coastal water).

Vegetation clearance

The NESPF does not apply to indigenous vegetation clearance that occurs prior to afforestation; this activity remains for regional and district councils to regulate.[55] Clearance of indigenous vegetation is otherwise provided for in Regulation 93. Outside SNAs, vegetation clearance is permitted where the vegetation is understorey, within an area of a failed plantation forest, or within an area of plantation forest that has been harvested within the previous five years. Clearance of indigenous vegetation within or adjacent to a plantation forest is also permitted where it is in the same ownership and does not exceed 1ha or 1.5% of the total indigenous area. Clearance of vegetation that is overgrowing a forestry track that has been used within the last 50 years and "*incidental damage*" to indigenous vegetation are permitted, including where the vegetation is part of a SNA.

The NESPF defines "*indigenous vegetation*" as "*vegetation that is predominantly vegetation that occurs naturally in New Zealand or that arrived in New Zealand without human assistance.*"[56]

"*Vegetation clearance*" is defined as:

> (a) the disturbance, cutting, burning, clearing, damaging, destruction, or removal of vegetation that is not a plantation forest tree; but
>
> *(b) does not include any activity undertaken in relation to a plantation forest tree.*[57]

Approach to SNAs

In addition to the vegetation clearance rule, some relevant activity-specific rules have particular controls relating to SNAs. A SNA is:[58]

> an area of significant indigenous vegetation or significant habitat of indigenous fauna that—
>
> (a) is identified in a regional policy statement or a regional or district plan as significant, however described; and
>
> (b) is identified in the policy statement or plan, including by a map, a schedule, or a description of the area or by using significance criteria.

Afforestation within a SNA or within 10m of one is a restricted discretionary activity.[59] Spoil and overburden cannot be disposed of within a SNA.[60] River crossings may not be installed within a SNA.[61] Replanting may not occur closer than the stumpline to an existing SNA.[62] Wilding conifer control is required within some SNAs (see the 'Wilding Conifers' section). Harvest plans must identify the location of SNAs that are to be protected during harvesting.[63]

There are no standards or setbacks in relation to SNAs that apply to earthworks or forestry quarries, except that:

- For earthworks where a forestry earthworks management plan is required,[64] it must identify the location of and mark on a map "*any features that are to be protected during the operation, including significant natural areas*".[65] These plans must also identify the environmental risks associated with the earthworks

and provide measures to avoid, remedy, or mitigate adverse effects on the environment.[66]

- For forestry quarries, excavated overburden must not be deposited into a SNA (however, no setback is required).[67] Where a quarry erosion and sediment management plan is required, it must identify the environmental risks associated with the quarrying activities and provide measures to avoid, remedy, or mitigate the adverse effects of the activity on the environment.[68]

Habitat, including for mobile fauna

Where certain bird species[69] nest in plantation forests, steps must be taken to identify their presence and the location of nesting sites, staff trained to identify the birds and their nests, and measures installed to avoid or mitigate impacts on the birds and their nests.[70] The NESPF does not otherwise address fauna species that may use plantation forests, such as bats, reptiles, frogs, and invertebrates.

Aquatic biodiversity

Aquatic ecosystems are adversely affected by sedimentation and loss of riparian vegetation (see the 'Fresh and Coastal Water' section). This part of the report addresses the NESPF's approach to activities that occur within water bodies.

The NESPF controls apply to perennial rivers, defined as "*a river that is a continually or intermittently flowing body of freshwater, if the intermittent flows provide habitats for the continuation of the aquatic ecosystem*".[71]

Disturbance of the bed or vegetation in the bed of a perennial river or lake is subject to controls relating to freshwater fish spawning. The Fish Spawning Indicator, incorporated by reference and available through MPI's website, provides information about freshwater fish presence, absence, and spawning periods.

Fish passage is addressed in two areas of the NESPF: fish passage must be maintained as part of river crossing construction,[72] and blockages to fish passage must be addressed in reporting on slash trap maintenance.[73]

Stringency

The NESPF allows greater stringency of rules to give effect to Policy 11 of the NZCPS (in relation to coastal and marine biodiversity), to give effect to an objective developed to give effect to the NPSFM, and rules that recognise and provide for the protection of SNAs.[74]

DOES IT WORK?

Vegetation clearance

The NESPF definition of "*indigenous vegetation*" may be problematic to apply as part of the vegetation clearance regulation, as the term "*predominantly*" is uncertain. It is unclear whether it refers to composition (eg more than 50% of individual species are indigenous), cover (more than 50% of the cover of a given area is taken up with indigenous species) or something else. This can result in uncertainty as to whether the rule applies. Furthermore, indigenous "*predominance*" can be particularly difficult to demonstrate in an enforcement context following vegetation clearance. In *Director-General of Conservation v Invercargill City Council*[75] the Environment Court declined to incorporate the term "*predominantly*" into a definition of indigenous vegetation because of its uncertainty. The definition in the NESPF was specifically noted.

In relation to the definition of "*vegetation clearance*", clause (a) is clear, but clause (b) is uncertain. It is unclear to what extent an activity that would be covered by (a) should be considered to relate to a plantation forest tree and thus be excluded by (b). For example, harvesting results in the destruction of vegetation (indigenous understorey) that is not a plantation forest tree, but is an activity undertaken in relation to a plantation forest tree.

Regulation 93 allows "*incidental damage*" of adjacent SNAs. The definition of incidental damage includes requirements that:[76]

> *(a) The damage does not significantly affect the values of the SNA; and*
>
> *(b) The ecosystem can recover to a state where it is predominately of the composition previously found at that location within 36 months.*

The need for judgement about whether the anticipated damage will "*significantly affect the SNA's values*", and whether the ecosystem will recover within 36 months makes this provision highly subjective. It is likely to be impossible to enforce except in the most egregious cases of damage. However, taking steps to minimise the risk of damage is more effective than even the best incidental damage rule.

Approach to SNAs

The NESPF appears to be premised on an assumption that SNAs are only remnant indigenous bush blocks that are readily identifiable from their vegetation. However, plantation forestry blocks themselves can provide significant habitat for indigenous fauna,[77] and the application of SNA criteria based on the ecological values present would result in some areas of plantation forestry (both forest and cutover) meeting the NESPF's definition of a SNA for that reason. Plantation forestry may also host indigenous vegetation qualifying as significant under s 6(c) of the RMA.[78]

This means that activities may require resource consent where they are undertaken within a SNA (or within the required setback from a SNA), such as harvesting of a plantation forest that is significant habitat for kiwi or bats or replanting in an area of cutover that is significant habitat for kārearea. A consent requirement is seen to be problematic by forestry operators. How to manage effects on SNAs within production forests requires careful thought, and effective management would likely demand additional and more nuanced controls than those in the current NESPF.

Afforestation may not occur as a permitted activity within SNAs, but in regions that have not identified SNAs in their regional policy statement or plans, this relies on the forestry operator proactively identifying that the area where afforestation is proposed is not a SNA. This is unlikely to be a significant issue in forested areas, but where shrublands or grasslands would meet SNA criteria, identification becomes more complex and because indigenous vegetation clearance (controlled outside the NESPF) is not necessarily required prior to afforestation, there may be no interaction with the council prior to afforestation occurring. Conversion of grassland and shrubland to exotic forestry is considered to be a significant risk, especially given anticipated forestry expansion under the One Billion Trees Programme.

Many plantation forestry activities are not required to be set back from SNAs (eg earthworks), and where setbacks are required (generally of 10m) they are likely to be insufficient to protect SNAs, particularly from the impacts of harvesting, where the trees themselves may be as tall as 50m. The Scion assessment of the environmental costs and benefits of the NESPF did not include any evidence that a 10m setback would be adequate to protect SNAs.[79]

While harvest plans must identify the location of SNAs to be protected, a requirement to proactively plan for SNA protection from the point of afforestation would be more effective in ensuring protection is achieved over time. This would require consideration of how the overall forestry operation was likely to affect SNAs and to incorporate these considerations into forest design and planning.

Habitat, including for mobile fauna

The NESPF's nesting bird regulation is unlikely to be enforceable except in very clear cases, because its requirements are too general. Compliance is achieved where (unspecified) training is provided so that operators can identify the presence of birds, and where (unspecified) steps are taken to avoid or mitigate impacts on nest sites. This level of generality is also inadequate to address what may be significant adverse impacts on threatened species.

An obvious shortcoming in the NESPF is that species other than birds are not provided for at all. Many species have lost so much of their natural, indigenous habitat that they rely on plantation forestry habitat. Nearly three-quarters of indigenous forest has been cleared in the last 1000 years, including 85% of lowland forests and wetlands. In some of the main plantation forestry regions – Gisborne, Waikato, Bay of Plenty, Hawke's Bay and Canterbury – indigenous forest losses have been high (84%, 77%, 52%, 83%, and 91% respectively). Even in areas like Gisborne that retain relatively large areas of indigenous vegetation (23%), only 15% of this is original vegetation and there are only 25ha of intact forest remaining in the lowland areas. Nearly half of all forest in the Gisborne district is now exotic. Exotic plantation forests are therefore becoming more important in some regions as habitat for helping to conserve indigenous fauna on a landscape scale. Failing to both assess the effects of forestry activities on indigenous fauna and ensure the protection of species that live in plantation forest could have significant impacts, even including species extinction.[80]

FSC's certification scheme places additional indigenous fauna management requirements on plantation forestry operators, demonstrating that management of indigenous species within plantation forests is not incompatible with forestry operations. Signatories are required to identify indigenous habitat that supports rare, threatened, or endangered species and that is important to their life cycle, and protect it in management planning. Within production areas, the presence of populations of rare, threatened, or endangered species or areas important to their life cycle is to be progressively identified and mapped as either "*known presence*" or "*reasonable expectation of finding*" before harvesting in management plans and site-specific work prescriptions.[81] Rare, threatened, or endangered species known to be present, or discovered in production areas, are to be protected and managed.[82] Management plans and work prescriptions for areas due for harvesting or silviculture are required to detail steps to be taken to protect rare, threatened, or endangered species in production areas.[83] This includes progressively training employees and contractors in recognition of these species, and in contingency planning to enable protection of located species.[84]

FSC certification also requires that a proportion of the overall forest management area be managed so as to restore the site to a natural forest cover.[85] At least 5% of the management unit must be retained in or restored to natural forest, and a minimum of 10% of the ecological district or region must be protected or restored to indigenous vegetation. However, this can be achieved through "*equivalent ecological effort*", which includes steps such as active restoration of reserves, where there is a deficit of reserve set-aside.

These measures suggest that if the objective is to conserve indigenous species that rely on plantation forests, a much more comprehensive and integrated approach is required rather than simply identifying bird nesting sites and avoiding or mitigating effects on these. The FSC certification scheme's standards indicate that foresters themselves are aware of this and are actively working to manage effects on indigenous species.

Similarly, a recent report[86] describing current knowledge of indigenous fauna within plantation forests and the impact of forest harvesting concluded that given the diverse habitat requirements, dispersal abilities, and threat status of indigenous fauna, a multifaceted approach will be required within plantation forests to help conserve indigenous biodiversity on a landscape scale. The report found this approach should include retaining areas of forest which develop high structural complexity, and maintenance of mixed-age exotic stands and individual threatened species programmes. Retention forestry, the practice of setting aside small areas within plantation forests, is noted as having emerged in recent decades as an effective, practical approach to achieve biodiversity gains internationally, and is now used in many countries

including the United States, United Kingdom, Canada, Australia, Germany, Sweden, and Argentina.

The report also includes many specific management recommendations that could be considered alongside existing FSC-based standards as part of the formulation of specific NESPF controls, rather than a generic 'avoid or mitigate' approach. It identified that few studies have been carried out on indigenous fauna in plantation forests in Aotearoa and that further information would assist to understand and provide for species conservation.

Excess sediment in estuaries and other marine ecosystems can smother habitats, such as seagrass meadows and mussel beds, and detrimentally affect water clarity[87]. Sub-tidal rocky reef systems are also at risk.[88] Some very high value areas like Mahurangi Harbour, Long Bay Marine Reserve, and Hahei Marine Reserve can be heavily impacted by sediment. In theory, the NESPF allows councils to apply more stringent rules to protect SNAs and other areas meeting Policy 11 of the NZCPS in the coastal marine area, but in practice only a few councils have identified marine SNAs. As a result, ecologically significant coastal sites may not receive adequate protection from sedimentation impacts through regional rules.

Freshwater biodiversity

Ephemeral streams only flow for part of the year, after rainfall, and so do not come within the NESPF definition of perennial river. While ephemeral streams tend to have reduced fish communities, they are highly important for invertebrate life. By not including ephemeral streams in the regulations controlling effects on freshwater, the NESPF is failing to provide protection for entire ecosystems.

Freshwater bodies can provide significant habitat for indigenous fauna. While the NESPF generally recognises SNAs on land and includes provisions to protect them, it is less effective at controlling activities within freshwater SNAs. River crossings other than fords (culverts, drift decks, and temporary river crossings) may be installed as a permitted activity regardless of the water body's significance as habitat. The Opouri River in Marlborough was given as an example where this is of significant concern. New fords are not permitted in a river listed in a regional plan or water conservation order as a habitat for threatened indigenous freshwater fish or a freshwater fish spawning area, but this does not provide any protection for indigenous freshwater fish that are at risk but not threatened, except when they are spawning. In theory greater stringency can be applied to meet SNA criteria but in the freshwater context inclusion of criteria for identifying freshwater SNAs is unusual and actual identification is even more unusual.

The NESPF focuses on streams as freshwater fish spawning habitat (using the Fish Spawning Indicator) and does not capture the broader ecosystem value of freshwater habitat, or habitat at other stages of a freshwater fish's life. The Fish Spawning Indicator itself has shortcomings, in that generally the models used are national models for freshwater fish presence and based on the New Zealand Freshwater Fish Database (NZFFD), which is more complete in some regions than others. There is a range of reasons for this, including that tangata whenua in some regions do not support publication of information about their taonga species and other natural values, which then presents as an 'absence' in the database. There is also criticism of the accuracy of the freshwater fish spawning periods used as not being regionally appropriate in some cases.

The NZFFD and Fish Spawning Indicator are excellent tools and valuable when used for the right purpose. However, that purpose is not a regulatory one, especially one where the presence or absence of data is being used to determine presence or absence of fish. Multiple submissions on the NESPF and feedback received by the reviewers raised issues with reliance on the NZFFD and Fish Spawning Indicator, due to significant gaps in data.

National Policy Statement for Indigenous Biodiversity

The government is currently developing a proposed NPS for Indigenous Biodiversity, based on the draft prepared by the Biodiversity Collaborative Group. The Group's draft NPS includes specific provisions relating to plantation forestry. Its accompanying report, which sets out complementary measures for maintaining indigenous biodiversity, identified gaps in and issues with the NESPF's management of effects of plantation forestry on indigenous flora and fauna. The content of a NPS for Indigenous Biodiversity may have implications for the NESPF, which will need to be considered.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

Vegetation clearance

- Review definitions of "*indigenous vegetation*" and "*vegetation clearance*" to ensure they are sufficiently certain to be enforceable. Delete reference to "*predominantly*" in the "*indigenous vegetation*" definition.
- Amend the requirements for harvest plans to include:
  - A requirement to identify the measures that will be taken to ensure SNAs are protected during harvesting
  - Where "*incidental damage*" to SNAs is anticipated, details of how the forestry operator has determined that such damage will meet the definition of "*incidental damage*" (including that the damage will not significantly affect the values of the SNA and that the ecosystem will recover to a state where it is predominately of the composition previously found at that location within 36 months)
  - A requirement for independent expert ecological advice in relation to the above matters

Approach to SNAs

- Recognise that areas of plantation forest may qualify as a SNA due to the presence of significant indigenous vegetation, or because they provide significant habitat for indigenous fauna. Tailor the NESPF controls relating to SNAs to address these circumstances. This will require a much more comprehensive approach to controlling the effects of plantation forestry activities on indigenous fauna species within plantation forests than is currently provided for under the NESPF.
- Require a new forestry plan at the point of afforestation that identifies where SNAs are located and how they will be protected throughout the plantation forestry rotation. As part of that plan, require forestry operators to demonstrate prior to afforestation that areas where afforestation is proposed do not contain indigenous vegetation cover. If they do contain indigenous vegetation cover, require them to demonstrate that the indigenous vegetation is not a SNA.
- Review SNA setback provisions (such a review should include expert ecological advice) and increase setbacks where ecological advice indicates this is required to protect SNAs.
- Require and incentivise regional councils to progress identification of marine SNAs, and provide guidance to assist councils to derive regional rules relating to plantation forestry that address effects of sediment on marine SNAs.

Habitat, including for mobile fauna

- Incorporate integrated species conservation measures for all indigenous species that use plantation forests as habitat. Ensure this is reflected in regulations and harvest plan requirements (which to be meaningful must be verified and able to be changed by councils). Species conservation measures should not be limited to steps to avoid or mitigate impacts on individuals.
- Further investigation of indigenous fauna within plantation forestry should be encouraged.
- Consider whether support in the form of grants for forestry owners and managers to help retain habitat that benefits biodiversity (other than existing SNAs which must be protected by law) should be provided.

Freshwater biodiversity

- Recognise that freshwater biodiversity is not limited to fish species, and ensure other aquatic species are also recognised and protected in the NESPF, including by providing protection to ephemeral water bodies.
- In relation to indigenous freshwater fish, continually improve the Fish Spawning Indicator by ongoing investment in verification, testing, and use of regional data. Enable an alternative regulatory mechanism to be used in areas where the NZFFD is known not to be an effective predictor of presence or absence.

National Policy Statement for Indigenous Biodiversity

- After the NPS for Indigenous Biodiversity has taken effect, undertake a review for the specific purpose of aligning the NESPF with the NPS for Indigenous Biodiversity.

Kea


Wairau River

6 Fresh and coastal water

THE CURRENT NESPF: WHAT DOES IT SAY?

All activities covered by the NESPF are subject to at least one permitted activity standard aimed at controlling effects on fresh or coastal water. These come within five broad categories:

- Setbacks
- Mixing or minimisation of sediment
- Depositing material into or in proximity to water
- Management plans
- Water body-specific activities

Controls based on erosion susceptibility and classification under the ESC are also directly relevant to controlling impacts on fresh and coastal water, as are controls relating to freshwater fish passage. These are discussed under the 'Erosion' and 'Indigenous Biodiversity' sections.

Setbacks

A setback is the most common water-related permitted activity standard in the NESPF. A setback is defined in the NESPF as "*the distance measured horizontally from a feature or boundary that creates a buffer within which certain activities cannot take place*".[89]

There is variation between activities regarding setback distance and the water bodies to which a setback is applied. To be undertaken as a permitted activity (provided the other permitted standards are met) afforestation, the first activity addressed in the NESPF, must not occur:[90]

- Within 5m of a perennial river[91] less than 3m wide, or a wetland larger than 0.25ha
- Within 10m of a perennial river greater than 10m wide, a lake larger than 0.25ha, an outstanding freshwater body, a water body subject to a conservation order, or a SNA
- Within 30m of the coastal marine area

Operation of harvesting machinery,[92] mechanical land preparation[93], and replanting[94] are subject to the same setbacks. An exception applies to harvesting machinery, with operation able to occur within the setback distances if "*disturbance to the water body from the machinery is minimised*" and the machinery is operated at a water body crossing where slash removal is necessary; where essential for directional felling in a chosen direction; or to extract trees from within the setback. Replanting is also subject to an additional setback standard requiring resource consent for replanting closer than the existing stumpline adjacent to a perennial river, wetland, lake, SNA, or the coastal marine area.

Different setbacks apply to earthworks which, to be permitted, must not occur within 10m of all the above listed water bodies, except for SNAs which are not addressed.[95] The same 30m setback from the coastal marine area applies. The earthworks setbacks are subject to exceptions for river crossings, slash traps, specified volumes of spoil, and maintenance of existing earthworks.[96]

A slightly different set of setbacks again applies to forestry quarrying, with a 20m setback applying to perennial rivers of any size, a wetland larger than 0.25ha, or a lake larger than 0.25ha, and a 30m setback to the coastal marine area.[97] No other water bodies are mentioned (eg outstanding water bodies).

In all but one instance, if an activity is proposed to be undertaken within the setback a restricted discretionary activity resource consent must be applied for. The exception is harvesting where inability to comply results in a controlled activity resource consent requirement unless being undertaken in Class 8e land or an area not classified under the ESC. In those two instances, restricted discretionary resource consent is required.

Mixing or minimisation of sediment

There are two broad categories of permitted activity standards focused specifically on sediment (excluding ESC-related controls). The first is the use of a general

standard, the wording of which mimics s 70(1) of the RMA,[98] requiring sediment to be managed to ensure that after reasonable mixing it does not give rise to "*a conspicuous change in colour or visual clarity*", "*the rendering of freshwater unsuitable for consumption by farm animals*" or "*any significant adverse effects on aquatic life*". Earthworks, harvesting, mechanical land preparation, and the use of slash traps are all subject to such a permitted activity standard.[99]

Except for harvesting, inability to comply with the standard results in a restricted discretionary resource consent requirement. For harvesting, inability to comply results in a controlled activity resource consent requirement (unless being undertaken in Class 8e land or an area not classified under the ESC). In those two instances, restricted discretionary resource consent is required.

Falling within the second category are permitted activity standards which refer to minimising sediment entering water. In respect of earthworks, harvesting, and mechanical land preparation, stabilisation of the area where the activity is being undertaken must be done to "*minimise*" sediment entering water and resulting in at least one of a number of listed impacts. Those impacts differ slightly between activities. All include the impact of damage to the receiving environment, and have a variation focusing on damage, damming, or diversion of the waterway. Harvesting also includes degradation of habitat or the riparian zone.[100] Inability to comply results in the same resource consent requirements as under category one set out in the paragraph above.

Depositing material

Restrictions on placement of material in a water body, or within specifically identified proximate areas, is another method by which the NESPF addresses the risk of adverse effects on fresh and coastal water. Common between slash, spoil for earthworks, excavated quarry burden, and disturbed vegetation from harvesting is a permitted activity standard that material must not be deposited into a water body or coastal water.[101]

All are also subject to additional and more specific deposition restrictions.

Slash from pruning and thinning or harvesting cannot be deposited on land that would be covered by water during a 5% annual exceedance probability event as a permitted activity. However, if this (and the restriction on deposition in a water body) is not complied with, removal is only required if it would not be unsafe and if required to avoid blocking and damming, erosion, significant adverse effects on aquatic life, or damage to downstream environment or property.[102]

Deposition of spoil is also not permitted if it is proposed to be over slash or woody vegetation, or "*onto land in circumstances that may result in the spoil or sediment entering water*".[103] Excavated burden from quarrying is subject to a similar restriction, with an extension to prevent deposition within a setback as a permitted activity.[104]

Disturbed vegetation from harvesting is subject to additional permitted controls which require deposition to avoid diversion or damming of water and degradation of aquatic habitat or the riparian zone. In addition, as a starting point, harvesting must be undertaken in a manner which sees trees felled away from water bodies and the riparian zone unless unsafe. In steeper areas, the ability to fell away from water bodies is limited. If unsafe, trees must be "*felled directly across the water body for full length extraction before de-limbing or heading*". Full suspension harvesting is required across rivers of 3m or more in width.[105]

Inability to comply with permitted activity slash standards for pruning and thinning to waste, and harvesting in green-, yellow-, or orange-zoned land, results in a controlled activity resource consent requirement. Otherwise, restricted discretionary resource consent is required.

Earthworks that do not comply with spoil deposition standards are a restricted discretionary activity. Forestry quarrying in green-, yellow-, or orange-zoned land[106] that does not comply with the excavated burden deposition standards is a controlled activity. In red-zoned land, earthflow terrain in orange-zoned land, or an area undefined in the ESC, restricted discretionary activity status applies.

Management plans

Management plans required for earthworks, harvesting, and forestry quarrying all have water-focused components.[107]

The earthworks and harvest management plans must identify all water bodies, setbacks, the coastal marine area, registered drinking water supplies, existing and proposed river crossings, and slash storage areas. For sites with perennial rivers, they must identify downstream rivers, lakes, estuaries, or the sea if those areas are at risk of slash or sediment deposition if mobilised.

Specifically related to the earthworks management plan, a description of works to be undertaken and the management practices that will be used to avoid, remedy, or mitigate risks (including erosion and sediment control measures) is required. The harvest plan must include a description of harvesting methods, timing, duration, intensity, and management practices that will be used to avoid, remedy, or mitigate risks on features listed above. Both plans must also include response measures if heavy rainfall occurs.

The forestry quarrying management plan is simply required to identify on a map wetlands and lakes larger than 0.25 ha, perennial rivers, water tables, the coastal marine area, and setbacks.

Water body-specific activities

River crossings and slash traps are subject to their own suite of specific permitted activity standards.

Subpart 4 covers five different types of river crossings: single culvert, battery culvert, drift deck, ford, and single span bridge. There are seven permitted activity standards applying to all crossing types. Each is then also subject to a number of specific standards.

Common controls relevant to impacts on water are extensive and mean that for a river crossing to be permitted it must (in summary):

- Not alter the natural alignment or gradient of the river[108]
- Provide for fish passage[109]
- Not cause or induce erosion of the bed or bank, or create sedimentation, and must be maintained to avoid erosion[110]
- Not be located within a wetland greater than 0.25ha, a wetland less than 0.25ha if it covers 20m or more, an outstanding freshwater body, a water body subject to a water conservation order, or a SNA[111]
- Discharge no contaminants other than sediment.[112]
- Be designed taking all practicable steps to avoid deposition of organic matter or sediment, to minimise disturbance, and avoid concrete entering water[113]
- Be constructed so that elevated sediment levels do not occur for longer than 8 hours, with machinery out of the water body unless necessary, and so that materials and equipment that are in the water are removed within five days of completion[114]
- Be subject to flow estimates using the incorporated method[115]

Permitted standards specific to each crossing type are set out in Regulation 46 and relate generally to location, size, and design.

Inability to comply with the common permitted activity standards (except for the flow estimate requirement) leads to a restricted discretionary activity resource consent requirement. Inability to comply with the crossing type-specific standards means the crossing becomes a controlled activity. Types of river crossings not covered by the NESPF are a discretionary activity.

Specific controls on slash traps are contained in Subpart 9. A slash trap is defined as "*a structure set in a river, on the bed of a river, or on land to trap slash mobilised by water*". Standards relevant to impacts on water relate to flow, quality, and natural character. In summary, in order to be a permitted activity slash traps must:

- Allow water to flow freely, avoid damming, and be lower than 2m[116]
- In areas where the upstream catchment is 20ha or larger, must not be located within the bankfull channel width[117]
- Be inspected within five working days of a "*significant rainfall event in the upstream catchment that is likely to mobilise debris*"[118]
- Be cleared of debris following a 5% annual exceedance probability flood event[119]
- Be maintained to avoid erosion and to ensure effectiveness[120]
- Not alter the natural alignment or gradient of the river, or cause or induce erosion[121]
- Discharge no contaminants other than sediment[122]
- Be designed to take all practicable steps to avoid deposition of organic matter or sediment, to minimise disturbance, and avoid concrete entering water[123]
- Be constructed so that elevated sediment levels do not occur for longer than 8 hours, with machinery out of the water body unless necessary, and so that materials and equipment that are in the water are removed with five days of completion[124]
- Not result in specified outcomes after reasonable mixing, as discussed above under 'Mixing or Minimisation of Sediment'[125]

Inability to comply with permitted activity standards results in a restricted discretionary activity resource consent requirement.

Catch-all discharge, disturbance and diversion provision

Regulation 97 effectively comprises a 'catch-all' permitted activity relating to discharges, disturbances, and diversions. It confirms that discharges of sediment, disturbance of the bed or bed vegetation of a river or lake, and diversion of water associated with plantation forestry activities are permitted activities, subject to the standards set out under the relevant subpart in the NESPF. It then introduces an additional, overarching standard to sit alongside the activity-specific standards relevant to those impacts relating to protection of freshwater fishing spawning areas. It also introduces an exception to the NESPF's disturbance provisions by defining disturbance of the bed or bed vegetation to exclude:

> *(6) ...*
>
> *(a) vehicles using a ford to cross the wetted river bed at a rate of up to 20 axle movements per day:*
>
> *(b) hauling logs over the bed of a river less than 3 m wide where butt suspension is achieved in the segment of the river marked in the Fish Spawning Indicator, in the relevant spawning period shown in the fish spawning indicator, unless any species listed in Group B in the Fish Spawning Indicator is present:*
>
> *(c) clearing a slash trap.*

Regulation 97 also addresses wetland disturbance and classifies it as a permitted activity subject only to limited freshwater fishing spawning standards, provided the wetland is greater than 100m^2 and less than 0.25ha, or greater than 100m^2 and the activity is harvesting.

Activities that cannot comply with Regulation 97 become a discretionary activity.

Stringency

A number of the areas in respect of which plans have the flexibility to be more stringent than the NESPF are relevant to water. Directly relevant is provision for increased stringency to:

- Give effect to "*an objective developed to give effect to the National Policy Statement for Freshwater Management*"
- Give effect to Policy 22 of the NZCPS:

  Policy 22 Sedimentation

  (1) Assess and monitor sedimentation levels and impacts on the coastal environment.

  (2) Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water.

  (3) Control the impacts of vegetation removal on sedimentation including the impacts of harvesting plantation forestry.

  (4) Reduce sediment loadings in runoff and in stormwater systems through controls on land use activities.

  Even though Policy 22 relates to coastal water, it is also relevant to freshwater management because it could be relied on to impose more stringent controls further up the catchment.
- Recognise and provide for the protection of freshwater and marine SNAs
- Manage relevant unique and sensitive environments such as "*activities within 1km upstream of an abstraction point of a drinking water supply for more than 25 people where the water take is from a water body*"

Additional protection for fresh or coastal water is indirectly available via the ability for plans to be more stringent to give effect to Policies 11, 13 and 15 of the NZCPS, and to recognise and provide for the protection of ONLs. Protection of coastal biodiversity as required by Policy 11 of the NZCPS may demand controls focused on water quality outcomes to, for example, avoid adverse effects on a threatened species, marine reserves, or on the habitat of species at the limit of their natural range. Similarly, protection of natural character or landscape may demand controls relating to water quality or water body formation if presence of water bodies or a specific water body is a value contributing to the natural character of an area or classification as an ONL.

Does it work?

What can be said for the NESPF is that it contains numerous provisions relating to fresh and coastal water. The question, therefore, is less about whether gaps need to be filled and more about the adequacy of what is there.

This report does not intend to address all water-related provisions, but rather focuses on a subset of key, high level issues. For example, technical parameters relating to crossing construction and design are not addressed, nor are controls relating to minimum stormwater diameters on different slopes or to aquifers. The report is intended to be the starting point for a more detailed analysis.

Setbacks

To start on a positive note, the inclusion of setbacks in the NESPF is itself a win, as setbacks are often a contentious issue when making or changing regional or district plans. Unfortunately, *how* they have been included raises concern.

First, the adoption of setbacks is pointless if the setback distances are inadequate to protect riparian and instream ecosystem health. Research on riparian setback distances indicates that a minimum setback width of 10m is needed to achieve improvements in instream habitat and provide sustainable riparian areas.[126]

The NESPF's setbacks for afforestation, harvesting machinery, mechanical land preparation, and replanting from a perennial river less than 3m wide (or a wetland larger than 0.25ha) do not meet the scientifically established 10m minimum. Instead, only a 5m setback is adopted.

A complication which needs to be factored into setback width is the extent of ground disturbance that occurs during harvesting. Removal can result in significant disturbance extending well into the setback area, meaning that, for example, only 5m of a 10m setback will remain intact. This degradation needs to be accounted for in any setback width, as do the water absorption impacts of trees, in particular *Pinus radiata*, in close proximity to wetlands and smaller water bodies. If trees are planted too close to these features they will effectively be 'sucked dry.'

The adoption of inadequate or minimum setbacks at the point of replanting misses an opportunity to reduce or remove risks of adverse effects on fresh and coastal water. Permitted activity setbacks at replanting should be set at a conservative distance that aligns with the distance necessary to achieve protection of the most sensitive water bodies.

The lack of scientific justification for setbacks less than 10m, the apparent failure to factor in degradation and loss of the setback buffer during harvesting, and the well-recorded adverse impacts on water quality, natural character, and aquatic ecosystems of forestry form a potent trio that call into question the lawfulness of the NESPF's permitted setback standards under s 43A(3) of the RMA.

Putting setback width to one side, the limits on water bodies subject to setback standards are also concerning. For example, setbacks are only required for wetlands greater than 0.25ha – which is a 50m by 50m wetland. New Zealand's wetlands are compositionally unique and are home to many endemic flora species. They are generally accepted to have reduced nationally by 90%; they are on the precipice of total loss. Wetlands smaller than 0.25ha have very high ecological values, both in an intrinsic sense and in terms of ecosystem services. No ecological justification for restricting protection to wetlands greater than 0.25ha appears to be provided in the background documents. The lawfulness of this approach is questionable, with s 6(a) and (c) of the RMA requiring the preservation of the natural character of all

wetlands, and the protection of significant indigenous vegetation and habitat to be recognised and provided for as a matter of national importance. Similarly, the NPSFM requires protection of the significant values of wetlands generally, not only those of a certain size. Issues around the practicality of identification and delineation of wetlands are acknowledged. However, wetland identification and protection have been identified by the government as core components of its Essential Freshwater work programme, which will hopefully assist.

Rivers less than 3m wide are equally as valuable. Smaller streams in the headwaters are the main conduits to lower reaches. Water quality impacts there will significantly increase cumulative impacts down the catchment. Loss of riparian vegetation in upper reaches will likely result in increased water temperatures at the point of clearance and down the catchment due to loss of shading. Smaller rivers, both those with continuous and intermittent flow, and surrounding riparian vegetation, also provide critical ecological habitat. For example, macroinvertebrates and indigenous freshwater fish, like the shortjaw kōkopu, take refuge in streams that are intermittent or as small as 0.3m wide in the upper reaches of a catchment, and riparian vegetation alongside headwater streams provides important spawning habitat during autumnal freshes.

The short point is that size of a water body is not determinative of its value, so should not be used as the determinant for the application or width of a setback. What should be determinative is the sensitivity of the water body, and its slope, soil, and rainfall.

The permitted setback standards also suffer from a lack of consistency. Setbacks for some activities capture a much broader range of water bodies than others. Similarly, the matters of discretion applying to activities are different. No clear reason for these differences is apparent.

Mixing or minimisation of sediment

The underlying issues with the NESPF's permitted standards relating to mixing or minimisation of sediment relate to uncertainty and lack of measurability.

The permitted standards relating to mixing uplift the words of s 70(1)(c)–(g) of the RMA (or a subset of those). However, subsections (c)–(g) are not put forward by s 70 of the RMA as standards that should be applied to a permitted activity in a plan. Rather, on the face of s 70, they constitute the test that a regional council must apply before it classifies a discharge to water or land which may enter water as a permitted activity. The regional council must satisfy itself that the standards that do apply to an activity proposed to be permitted will mean none of the effects in s 70(1)(c)–(g) are likely to arise. This interpretation of s 70 of the RMA is consistent with the requirements that a permitted activity standard should be specific (so that an applicant can know whether it will comply), should not include a "*value judgement*", and should be set at the point that the consent authority can be confident that it will fulfil its obligations under the RMA[127] (in respect of water, being primarily ss 30(1)(c) and 70 of the Act, and the NPSFM).

Failure to include precise and measurable permitted activity standards results in difficulties with compliance and enforcement. For example, how does an operator know if a colour change qualifies as "*conspicuous*"? What is there to ensure that an operator and regulator are applying the same definition of "*conspicuous*"? How does a forester know whether or not its operation is having significant adverse effects on aquatic life without constant

Port Underwood

monitoring? In the NESPF's defence, this is an approach that has been adopted by regional plans. However, that is not a reason for a national regulation to itself adopt an inadequate approach.

Precise measures have been developed to assess compliance with the requirements of s 70 of the RMA. For example, a "*conspicuous*" change has been defined as a percentage change in horizontal visibility of a black disc between upstream and downstream measurement (the 'disc test'). The acceptable percentage change may decrease in water bodies with sediment-sensitive species to enable a regional council to be satisfied a permitted activity is not likely to have significant adverse effects on aquatic life. There are also specific measures for deposited sediment. These types of precise measures are likely to be easier to comply with.

Permitted activity standards relying on minimisation of effects suffer from similar problems. The word "*minimise*" is open to broad interpretation: whether it has been achieved is a value judgement, suggesting that it is not an appropriate permitted activity standard. A requirement simply to "*minimise*" impacts also risks non-compliance with the requirements of ss 30 and 70 of the RMA, as it does not install a clear, baseline level of acceptable effects. Instead, an activity can be considered compliant even if it has significant impacts (eg results in a significant amount of sediment entering a water body) provided the forester has done everything it can, within the confines of how it wants to run its operation, to "*reduce [sediment] to the smallest possible amount or degree*".[128]

On a plain reading of the permitted standard, minimisation of sediment entering water is only required if it will result in one of the specifically listed outcomes. For example, all soil disturbed by earthworks must be stabilised or contained to "*minimise*" sediment entering water and resulting in either diversion or damming of any water body, or damage to downstream infrastructure, property, or the receiving environment.[129] If sediment is not going to result in one of those outcomes, it appears it does not need to be contained. In contrast, disturbed soil generated from harvesting must be contained to "*minimise*" sediment entering water and resulting in the outcomes above *and* degradation of aquatic habitat, the riparian zone, and fresh or coastal water environments. There is no obvious justification for this difference. The deleterious effects of sediment are the same irrespective of the activity that has generated it.

Depositing material

Setbacks, uncertain and subjective wording, and an inability for councils to ensure locally nuanced controls are in place again rear their heads as high level issues with the NESPF's management of deposition of material.

Outside of avoiding deposition into a water body, the key permitted standard is avoiding deposition on land that would be covered by a 5% annual exceedance probability event. This report does not look at the adequacy of that percentage figure. What it does explore is whether this standard is sufficient on its own. It is probably not, especially for orange-zoned land. What the additional parameters should be is not clear and requires investigation. In some instances, for example on green- or yellow-zoned land, general storage setbacks from water bodies as an additional standard may be sufficient. However, in other areas, such as orange-zoned land, the management difficulties associated with gradient and soil may demand a case-by-case approach from the outset, which points towards a resource consent requirement.

Moving to deposition of spoil and excavated burden, both are subject to an additional permitted activity standard preventing placement "*onto land in circumstances that may result in [spoil/excavated burden] or sediment entering water*". Implementation would inevitably require a value judgement, which is not appropriate for a permitted activity standard (see the 'Structure and Language' section). Arguably, the adoption of such a standard indicates that site-specific controls are required for councils to be certain that effects are accounted for and appropriately managed.

Harvesting is also subject to a permitted standard that full suspension removal of logs is required over water bodies greater than 3m wide. This, in a similar vein to the setback provisions, ignores the importance of smaller streams. Practical limitations mean that full suspension over all water bodies is unrealistic. However, a case-by-case approach would allow for identification of highly sensitive locations, or key tributaries, and require full suspension over those sites. At present, this would theoretically be available in red-zoned land as a controlled activity condition. However, land around Aotearoa zoned as green, yellow or orange will all have water bodies smaller than 3m where a more careful approach may be justified. Management of harvested logs across or through wetlands is subject to additional control under the catch-all discharge and disturbance regulation, Regulation 97. Under Regulation 97(2) disturbance of a wetland is permitted only if the wetland is greater than 100m^2 and the associated activity is harvesting. Again, as discussed in relation to setbacks, this ignores the significant value of smaller wetlands, is inconsistent with their protection as a matter of national importance, and fails to give effect to the requirement in the NPSFM that the significant values of *all* wetlands, not wetlands of a certain size, are protected.

Freshwater management is extremely complex, as is the operation and management of a plantation forest. On top of this, the adverse freshwater impacts of plantation forestry are known and can be significant. This is not a situation that lends itself easily to a nationally applicable permitted activity management approach, especially when it comes to harvesting. It restricts the ability of councils to work with operators to develop appropriate harvesting and operational methods and put restrictions in place if necessary. Currently the situations where council involvement in harvesting will be triggered in respect of green-, yellow-, and orange-zoned land are limited. In green-zoned land, this might be acceptable but in some yellow-zoned land and for orange-zoned land there is still significant risk of water impacts due to the gradient and

soil associated with those areas. In addition, in red-zoned land that is not Class 8e harvesting is only a controlled activity. Although control is reserved over many matters (although an obvious gap is fauna habitat) a council's ability to install conditions is curtailed by the risk of being considered to have frustrated the consent.

Management plans

Management plans can be useful tools. However, their utility turns on the quality of the content and proper implementation and monitoring. Achievement of quality management plans under the NESPF faces two hurdles when it comes to managing effects on water.

First, the content requirements in Schedules 3 and 4 are incomplete. In some respects, important content is missing altogether, as not all forestry activities with effects on water are required to be included in a management plan. This means there is no complete picture of the impacts of an overall operation on water.

Second, there is no verification, feedback, or peer-review step of management plans by councils because their preparation is a permitted activity standard. Councils are unable to reject a plan or require changes to it where they consider it uses inappropriate methods. Review is simply a 'tick box' exercise to make sure the listed content is provided. This 'high trust' model of regulation is untested (see the 'Structure and Language' section).

Catch-all discharge, disturbance, diversion provision

Issues with this provision as it relates to wetlands have been addressed above.

A further issue is how disturbance is defined for the purposes of the regulation – which is to exclude vehicles using a ford to cross a wetted river bed at a rate of up to 20-axle movements per day. There are different views on the adequacy of this provision. On one hand, directing vehicle crossings to established fords is a good thing (provided the ford is well constructed) as this limits the extent of area impacted and the amount of sediment discharged. This is, of course, provided that the number of fords is limited, and their construction is directed away from sensitive areas. On the other hand, there appears to be no ecological or water quality justification for the 20-axle movement figure. In addition, the way in which the exception is framed – an exclusion to the meaning of disturbance – effectively creates a 'factual fiction'. It says that 20-axle crossings is not disturbance when it is. The courts have not looked favourably on factual fiction provisions relating to freshwater.[130]

Water-specific activities

Insofar as the permitted standards relating to river crossings and slash traps include setbacks, a "*reasonable mixing*" provision, a requirement to "*minimise*" effects, or water body or wetland minimum size, issues have been discussed above.

The two key issues in respect of river crossings are a failure to specify a maximum number of crossings, and a failure to require avoidance of crossings at ecologically sensitive locations.

The biggest issue with slash traps is not the adequacy or inadequacy of the permitted activity standards, but rather the NESPF's focus on them being the answer to controlling material mobilised during rainfall events. In many areas, in particular those with steeper gradients and soft soils, a slash trap is nothing more than an ambulance at the bottom of the cliff. They are a necessary component of slash management, but the focus on them is directing attention away from an issue at the heart of the forestry debate: that in some parts of Aotearoa, plantation forestry is located in environments that simply cannot cope with the pressures of harvesting. No control around placement of slash or number of slash traps is going to be sufficient to prevent significant amounts of debris being mobilised when it starts to rain heavily, especially in a clear-felled area. The simple response to this issue, which is unlikely to be palatable to operators, is not to clear-fell.

Stringency

There are multiple avenues available to councils to exercise increased stringency in relation to fresh and coastal water, which is a good thing. However, two issues stand out.

First, greater stringency is available in order to give effect to "*an objective developed to give effect to the National Policy Statement Freshwater Management*". For a council to include more stringent rules in reliance on this provision, it must have at least notified a plan change for the purpose of giving effect to the NPSFM, or have undertaken a full review of its plan and concluded its objectives[131] give effect to the NPSFM. Unfortunately, the freshwater planning process is not a fast one, and it is likely that a number of councils have not done either. In areas where that is the case, councils will be unable to rely on this provision to include more stringent rules. To make matters worse, it appears that some councils are carrying out the exercise of amending their plan to align with the NESPF, including the deletion of existing provisions (which does not require a full RMA Schedule 1 process), in advance of being ready to change their plan to implement the NPSFM. A simple solution to this issue is for greater stringency to be available in order to give effect to the NPSFM itself, as well as to an objective developed to give effect to the NPSFM.

Secondly, the potential evidential difficulties with successfully putting in place more stringent provisions have been discussed under previous sections. This issue is exacerbated in the fresh and coastal water context, because diffuse pollutants are a critical source of environmental degradation. Councils may face pushback on the basis of insufficient ability to attribute to forestry activities specific, and quantifiable, responsibility for a contaminant. This is most likely to occur in mixed-use catchments. However, even in the Marlborough Sounds where there has been extensive research undertaken that confirms forestry as a significant contributor to sediment

in the coastal marine area and freshwater tributaries, this issue is arising, with proceedings currently under way questioning the justification for the proposed Marlborough Environment Plan's more stringent rules.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

- Determine whether the permitted activity approach (both in respect of individual activities and overall) gives effect to the NPSFM, in particular: staying within limits; integrated catchment management; protection of ecosystem health, wetlands, and outstanding water bodies.
- Change the activity status of harvesting in orange- and red-zoned land to provide for regulatory oversight.[132] Review the activity status of harvesting in green- and yellow-zoned land, taking into account the issues identified by this report.
- Recognise that generous setbacks need to apply from the point of afforestation and replanting, because it is difficult to impose greater setbacks at a later stage.
- Review the NESPF's setback distances and reset at the appropriate distance to protect freshwater quality and the riparian zone, also accounting for the destruction to the setback as a result of undertaking the relevant activity.
- Review the coastal setback distances to ensure adequacy, and amend to increase if required.
- Review the areas to which the NESPF's setbacks apply, and amend to capture missing areas, (eg all wetlands) and ensure consistency in the water bodies to which setbacks apply across all activities.
- Review mixing and minimisation standards to determine whether a specific, measurable standard can be substituted. If it can, make appropriate amendments. If not, investigate and include the most appropriate alternative activity status.
- Investigate what additional placement and storage provisions are required to apply to deposited material. In doing so, consider whether different provisions should apply to different zones. If it is not possible to develop clear, measurable standards, investigate and include the most appropriate alternative activity status.
- Investigate additional provisions relating to suspension requirements over sensitive areas or water bodies, including wetlands. If it is not possible to develop clear, measurable standards, investigate and include the most appropriate alternative activity status.
- Investigate and report on the ecological and legal justification for adopting an exception to 'disturbance' for 20-axle movements at a ford per day. Make any necessary changes to respond to findings.
- Amend Regulation 6 to allow for more stringent rules in plans to:
  - Give effect to the NPSFM itself, as well as to objectives developed to give effect to the NPSFM
  - Expressly refer to the ability to include rules to control diffuse pollutants, to which plantation forestry contributes, when introducing more stringent rules to give effect to the NPSFM or Policy 22 of the NZCPS
- Include alignment of the NESPF with updated or newly introduced national freshwater policy (eg an updated NPSFM or a new, freshwater-focused NES) in the government's review of the NESPF. If any updated or newly introduced national freshwater policy is released after the government's NESPF review is completed, undertake a freshwater alignment review of the NESPF (for efficiency this could be undertaken in tandem with a NPS for Indigenous Biodiversity alignment review).

Para Wetland

Ōpotiki District

7 Erosion

THE CURRENT NESPF: WHAT DOES IT SAY?

The ESC is a risk-screening tool, developed by MPI for the NESPF. The tool combines climatic data with the New Zealand Land Resource Inventory and the land use capability (LUC) rating. The ESC determines the risk of erosion on land across Aotearoa based on its environmental characteristics. These characteristics include rock type, topography (steepness of the slope), and dominant erosion process (such as wind or water).

The ESC classifies land into four categories of erosion susceptibility according to the level of risk: low (green), moderate (yellow), high (orange), and very high (red). The ESC is used to classify Aotearoa into zones that align with these levels of risk, each of which have different restrictions under the NESPF. These zones are:

- Green- and yellow-zoned land:
  - Less likely to erode
  - Plantation forestry activities are permitted.
- Orange-zoned land:
  - More likely to erode
  - Plantation forestry activities are permitted, with some greater stringency for orange-zoned land with a slope of 25 degrees or more.[133] The NESPF's most relevant requirement is that a forestry earthworks management plan must accompany the harvest plan.[134]
- Red-zoned land:
  - Most likely to erode
  - Most plantation forestry activities cannot be carried out on red-zoned land without resource consent.
  - As per orange-zoned land, a forestry earthworks management plan must accompany the harvest plan.
  - There are exemptions to controls on red-zoned land for plantation forestry which is harvested under continuous cover forestry (where a minimum of 75% canopy cover is maintained) or small coupe harvesting (where no more than 2ha is clear-felled in any 3 month period).

DOES IT WORK?

There are two major issues in this section.

First, regarding erosion-prone land, is the NESPF facilitating the right tree, in the right place, for the right purpose?

Secondly, are the consent requirements for red-zoned land sufficient, or should these requirements be extended to orange-zoned land or even yellow-zoned land?

These issues are addressed in turn.

There is significant literature to support the benefits of woody vegetation cover for reducing localised surface erosion and mass-movement processes.[135] One research project found that afforestation of whole catchments can reduce loads of sediment into water bodies by as much as 90%.[136] On the face of that statistic it would be reasonable to conclude that plantation forestry should be encouraged on red-zoned land, which is arguably not the effect of the NESPF's requirement for resource consent for replanting and harvesting in those areas.

The problem is that it's not that simple, because the erosion-control benefits of plantation forests are short lived, lasting only as long as the trees are in the ground. On extraction that benefit is gone, and the bare face that remains can itself result in significant amounts of sediment ending up in sensitive receiving environments. This issue is particularly acute in respect of forestry operations which undertake extraction by clear-felling, the typical method in Aotearoa. This opens the 'window of vulnerability' – the period of time before the roots of new trees replace the rotting roots from the previous rotation. During this time, land is vulnerable to landslides, which may in turn mobilise slash, debris and sediment to be deposited into fresh or coastal water. The predominance of *Pinus radiata* in clear-felling systems is associated with a larger window of

vulnerability due to its rapidly rotting roots. Species such as beech, blackwood, cedar, cypress, eucalyptus, kauri, poplar, redwood, and totara have much slower root decay rates, thereby providing soil stability and land resilience for longer after harvesting (if they are harvested at all).[137]

Against that background, the right tree, in the right place in red-zoned land, is clearly a tree that stays put or one that is extracted while others remain to provide continued soil stability (ie continuous cover forestry).

To be consistent with that outcome, the NESPF and the wider forestry system need to disincentivise clear-fell forestry in red-zoned areas, and incentivise permanent or continuous cover forestry in red-zoned areas. Insofar as the NESPF's requirement for resource consent for replanting and harvesting in red-zoned land is a disincentive for clear-fell forestry, it is consistent with that outcome. However, although a restricted discretionary resource consent requirement may be a disincentive, it does not send a clear message that clear-fell harvesting in these areas is generally not acceptable. Permitted status for "*long-term ecological restoration planting of forest species*" or "*willows and poplars space planted for soil conversation purposes*"[138,139] and the NESPF's more lenient approach to continuous cover forestry are also consistent with the outcome sought. However, a question remains as to whether continuous cover forestry would be adopted in practice, notwithstanding a more lenient activity status. This is because in Aotearoa, unlike in Europe, the economic viability of continuous cover forestry systems is not clear. Economic viability depends on a host of factors which fall beyond the scope of the NESPF including forest revenue streams, subsidies, knowledge extension, and landowner aspirations. These factors may be beyond the scope of the NESPF, but they are critical issues that need to be addressed if we are to transition to more sustainable forestry methods. When it comes to establishing permanent forests, ensuring the One Billion Trees Programme's criteria are calibrated to favour red-zoned areas is critical.

If these two things don't happen, there is a real risk that red-zoned land will remain bare, or continue to rotate through a cycle of cover and stability to sediment loss, both of which are environmentally suboptimal.

The second major issue is whether the NESPF is too permissive in its treatment of orange-zoned land. Orange-zoned land is classed as 'high' erosion risk because it includes a number of LUC units that are highly vulnerable to erosion. Given that extreme weather events are increasingly likely because of climate change, the risk of erosion is also increasing. By permitting afforestation, harvesting, and replanting of plantation forest on orange-zoned land, especially when the intention is to clear-fell, there is a question as to whether the NESPF is consistent with s 43A(3)(b) of the RMA, which does not allow a NES to state that an activity is permitted if it has "*significant adverse effects on the environment*". It is likely that a resource consent requirement in order to assess the acceptability of both location and harvesting method is more appropriate, with more lenient provision made for continuous cover and small coupe harvesting as is currently the case under the NESPF for red-zoned land.

However, the same conundrum arises with this issue as with the first. The best outcome for orange-zoned land is for it to be forested. But the question is: in what sort of forest? In some orange-zoned areas plantation forestry that adopts current, typical methods will be acceptable and in others it will not. A resource consent requirement on orange-zoned land may discourage plantation forestry in those areas, which isn't necessarily a bad thing if the wider environment is sensitive to the period of intensive sediment loss that will likely follow harvesting. However, there needs to be something to fill the gap, so the land does not remain bare. Again, continuous cover forestry or permanent forest is that something. Unless there is an adequate enabling environment for establishing continuous cover or permanent forestry in place, there is a risk that orange-zoned land will remain bare by default.

In short, the NESPF cannot be seen in isolation from the wider context that it operates in, and relevant agencies need to put in place appropriate enabling mechanisms to facilitate outcomes that deliver maximum public value.

A subsidiary issue relates to the fidelity and granularity of the ESC: "*The ESC is recognised as having limitations related to: the underlying data it was derived from; the scale of mapping; and probable misclassification of some land.*"[140] This is inevitable for broad-brush zoning. It may result in restricting activities on sites where the risk of environmental damage is low or permitting activities on sites where the risk of environmental damage is high. Reliance on the ESC is therefore arguably at odds with the site-specific considerations that might result in the optimal balance between environmental and financial sustainability by enabling integrated land use management that is attuned to the capacities of the landscape.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

- Change the activity status for clear-fell harvesting in all red-zoned areas to non-complying. Provide for continuous cover forestry either as a permitted or controlled activity depending on the control considered necessary to address effects other than erosion.
- Change the activity status for clear-fell harvesting in all orange-zoned areas to restricted discretionary at a minimum. Provide for continuous cover forestry as a permitted or controlled activity depending on the control considered necessary to address effects other than erosion.
- Initiate a programme for the purpose of developing policy and other necessary mechanisms (eg upskilling and education) to facilitate a transition to more sustainable forestry methods, like continuous cover forestry.
- Review the One Billion Tree Programme criteria to ensure they operate to favour permanent, indigenous forest on red-zoned land.

Pelorus Sound

8 Wilding conifers

THE CURRENT NESPF: WHAT DOES IT SAY?

The NESPF includes provisions to address wilding conifer risk at the point of afforestation, when replanting with different species, and through provisions requiring removal of wilding conifers in specified situations.

The NESPF relies on establishing wilding conifer risk by using a risk calculator: the Wilding Conifer Calculator (WCC). Afforestation of a conifer species may not be carried out as a permitted activity in an area with a WCC score of 12 or more. A score of 12 or more means that afforestation requires consent as a restricted discretionary activity.[141]

Conditions on afforestation also require that all wilding conifers must be removed at least every 5 years after afforestation where established in wetlands or SNAs on the same property on which the afforestation activity occurs, and on any other adjacent properties under the same ownership or management as that of the property on which the afforestation activity occurs.[142]

Upon replanting, a resource consent is required if replanting with a different conifer species; in an area with a WCC score of 12 or more; and where the previous plantation had a lower risk calculator score.

Wilding conifers that have established in wetlands and SNAs must be eradicated before replanting begins if the wilding conifer has resulted from the previous harvest, or at least every 5 years after replanting if the wilding conifer has resulted from the replanting.[143]

Where resource consent is required for afforestation or replanting due to wilding conifer standards not being met, the council's discretion is limited to the level of wilding conifer risk; the mitigation proposed to restrict wilding conifer spread, including the species to be planted; effects on the values of SNAs or ONLs (where relevant); and information and monitoring requirements.[144]

A council could adopt more stringent plan provisions in relation to wilding conifers where this is related to protection of SNAs or ONLs.[145]

DOES IT WORK?

The key issues are that:

- The WCC is a 'high trust' tool which relies on the adequacy of the assessment.
- Controls may not be sufficiently stringent to minimise wilding conifer risk.
- The NESPF externalises much of the cost of wilding conifer control.

High trust tool reliant on adequacy of assessment

A WCC score is generated by a "*suitably competent person*" on behalf of the forestry company. This includes a person with silviculture experience.[146] There is no express requirement for the assessment to be carried out on site. Compliance with the NESPF rules is achieved by submitting a calculator score of less than 12. Councils have no discretion as to whether they accept an assessment, even if they disagree with it. There appears to be some concern about the quality of the assessments received so far.

While a calculator approach might be appropriate where the assessment is quantitative and objective, there are various subjective, qualitative aspects to the WCC that can change assessment scores significantly (eg where within a forestry block the "*siting*" assessment is carried out or the extent to which land is identified as "*downwind*").

Wilding conifer risk management is therefore an aspect of the NESPF that represents a 'high trust' model with little scope for independent regulatory oversight.

Controls may not be sufficiently stringent

The WCC takes into account species growth, species palatability (susceptibility to browsing by livestock), siting (topographical position relative to prevailing wind direction), downwind land use, and downwind vegetation cover before generating a binary permitted or consented outcome. The requirement for resource consent is set at the point at which there is 'high risk' of wilding conifer spread (ie a score of 12 or more).

The WCC should more accurately be viewed as representing a risk spectrum. A score of 12 or more represents 'high risk', a score of 10 or 11 indicates a relatively high risk; yet any score less than 12 means afforestation can occur as a permitted activity. Activities with a relatively high risk of causing significant economic and environmental effects on surrounding land would not normally be classified as permitted under the RMA.

A score of 0 in relation to the downwind land use (intensive grazing on developed pasture) or downwind vegetation cover (plantation forest or intensively grazed pasture) criterion means that the total score becomes 0 regardless of the score for other criteria. This potentially converts a moderate to high risk afforestation activity (eg Douglas fir afforestation in Marlborough) into a deemed low risk permitted activity. This means that the risk assessment is greatly influenced by those two criteria, even though the downwind land may be in different ownership, and the land use or vegetation cover could well change over the life of the initial and subsequent plantation forest rotations. This suggests that the WCC does not accurately reflect the risk of wilding conifer spread.

With respect to replanting, the NESPF is less stringent again. Consent is only required where there is a change of species; a WCC score of more than 12; *and* the previous crop did not have a higher risk score. The last clause applies even where the previous crop required resource consent due to wilding conifer risk. This means a high risk species like Douglas fir planted in the wrong area could be replanted there as a permitted activity (even if the previous crop had required resource consent). If the previous crop had resulted in wilding conifer spread, allowing the same activity to continue does not avoid, remedy, or mitigate adverse effects. This approach provides for the continuation and exacerbation over time of an activity with known adverse environmental effects that extend outside the property boundary, which simply makes no sense. Replanting high risk species should not be an expectation.

The guidance specifies that even with a total score of 0 a small risk of unwanted spread cannot be fully excluded. However, those are not requirements under the NESPF. The Forest Owners Association has said that forest owners undertake a range of measures to control wilding conifer risk, including planting buffer trees with a lower seed spread risk, such as *Pinus attenuata* or hybrid *radiata*, around the edge of plantations.[147] These measures are not requirements of the NESPF (although they could potentially be required for 'high risk' afforestation under a resource consent).

NESPF controls are not adequate to deal with wilding conifers that have established on properties other than that of the forest owner. For afforestation, the permitted activity requirement to control established wilding conifers is limited to SNAs, wetlands, and to the forest owner's land. The impacts of wilding conifers on biodiversity justify a stringent approach to wilding conifer removal in SNAs and wetlands, but it is not clear why removal of all wilding conifers is not required given the risk they pose to other environmental and economic values. The restriction of this provision to the forester's own land is understandable given the difficulty in requiring people to undertake activities on other people's land as part of a permitted activity framework. However, this could be addressed by requiring written approval from neighbouring landowners or consent conditions, which would allow for a discussion with neighbours on agreed conditions addressing their land.

Upon replanting, a similar restriction to SNAs and wetlands applies, but the provision does not appear to be restricted to the forester's land. It is not clear whether this is intentional.

Overall, the NESPF's provisions are inadequate to manage the significant environmental, cultural, and economic risks posed by wilding conifers.

Externalisation of cost

In a recent report based on surveys of landowners affected by wilding conifers, according to the participants the wilding conifers had come mainly from other properties, with 26% blamed on nearby commercial forestry. Eight per cent said wilding conifers were from their own forest and 4% said wildings were due to historic plantings by the government. There was a shift in attitudes about who should bear the cost of dealing with wilding conifers: in 2015 more respondents considered controlling wilding conifers should fall to the owner of the property from which the seeds came. By 2017 more people thought the government should take over. This potentially reflects the growing magnitude of the problem.

The New Zealand Wilding Conifer Management Strategy 2015–2030 and regional programmes like the Marlborough Sounds Restoration Trust are considered to be achieving good outcomes, but they require a huge amount of volunteer effort and public funding alongside forestry industry contributions.

While some spread of wilding conifers results from legacy state forestry service or shelterbelt issues, the costs associated with spread from plantation forestry should be borne by forestry companies.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

- Introduce a zoning or spatial planning approach that enables councils in moderate to high wilding conifer risk areas to require consent for afforestation or replanting in order to retain the discretion to assess wilding conifer risk and either decline consent or impose appropriate conditions. There is plenty of information about where the vulnerable areas are, and a consent process should apply in these areas.
- Reassess the WCC to ensure that it does not place undue reliance on neighbouring land cover and land use in assessing wilding conifer risk.
- Make changes to the replanting regulations so that they do not perpetuate previous high wilding conifer risk scenarios.
- Introduce permitted activity conditions requiring foresters to demonstrate that they have approached all landowners within the receiving environment of their plantation forest and that they have offered to undertake wilding conifer removal on those properties. If this offer has been accepted, the site should be incorporated into a wilding conifer management plan specifying appropriate objectives and actions to ensure wilding conifer removal will be undertaken.

Queen Charlotte Sound

9 Landscape and natural character

THE CURRENT NESPF: WHAT DOES IT SAY?

Landscape

Explicit provision for landscape in the NESPF is focused on two landscape categories: ONLs and visual amenity landscapes. Provision is further limited to only those ONLs and visual amenity landscapes that:[148]

- Are identified in a regional policy statement, regional plan, or district plan as outstanding or as having visual amenity values, however described
- Are identified in the policy statement or plan by their location, including by mapping, a schedule, or a description

When it comes to management and consideration of potential effects on landscape, the NESPF draws a clear distinction between establishment of plantation forestry and the undertaking of activities as part of the operation of a plantation forest.

Afforestation is subject to a permitted activity standard that it must not occur within an ONL. Inability to comply with that condition results in a restricted discretionary resource consent requirement. Discretion is restricted to "*the effects on the values of ... the outstanding natural feature or landscape*".[149]

No other activity covered by the NESPF and undertaken as part of operating a plantation forest is subject to a permitted activity standard specifically relating to potential impacts on ONLs.

Councils are able to include more stringent rules to address impacts on ONLs under Regulation 6. This regulation provides for a rule in a plan to be more stringent than the NESPF if it "*recognises and provides for the protection of outstanding natural features and landscapes from inappropriate use and development*", or if it gives effect to Policy 15 of the NZCPS (which requires the avoidance of adverse effects on ONLs in the coastal environment and the avoidance of significant adverse effects on all other coastal landscapes).

A measure of vicarious protection is arguably provided via permitted activity standards relating to water bodies (see the 'Fresh and Coastal Water' section), as water bodies or the presence of water are often values contributing to classification as an ONL.

Afforestation is also not permitted within a visual amenity landscape (as defined by Regulation 3). Inability to comply results in a controlled activity resource consent requirement *if* the relevant plan identifies plantation forestry activities as restricted in visual amenity landscapes. Control is restricted to effects on the visual amenity values of the landscape.[150] There is no ability for plans to be more stringent than the NESPF.

There is some consideration of effects on amenity in a more general sense via permitted activity standards requiring afforestation and forestry quarrying to be set back specified distances from a dwelling(s).[151]

Natural character

Areas of identified natural character value (eg areas of outstanding natural character) are not referred to by the NESPF.

Ability to address effects on the natural character of the coastal environment is available under Regulation 6 and includes the ability for plans to include rules that are more stringent than the NESPF to give effect to Policy 13 of the NZCPS. It is also addressed to a limited extent via controls on activities occurring within 30m of the coastal marine area.

The ability to address effects on natural character of water bodies and wetlands is covered to some extent by permitted activity standards relating to those areas, although natural character is generally not itself specifically the focus of those provisions (see the 'Fresh and Coastal Water' section). Where resource consent is required, impacts on natural character are only relevant if referred to in the matters over which control or discretion has been reserved.

DOES IT WORK?

There are four high level issues with the NESPF's approach to landscape and natural character.

First, the definitions of ONL and visual amenity landscape mean that these landscapes must be specifically identified in a policy statement or plan in order to fall within the NESPF's ambit. This means that unless a council has gone through an identification exercise and incorporated this into its policy statement or plan, there is no ability for it to control afforestation or adopt more stringent rules for landscape protection purposes. There is no ability to rely on identification via criteria which allow for a case-by-case assessment, as there is for SNAs.[152]

The extent to which this is an issue in practice depends on the extent to which these landscapes have been identified in policy statements or plans, and the quality of that identification process. On a cursory review many district plans had identified ONLs via mapping or description,[153] but there are important exceptions, such as Tasman (which includes Golden Bay) and Wellington, meaning there are many ONLs not protected. Conversely, although many district plans have discussed the importance of amenity to different zones or locations, they have not specifically identified visual amenity landscapes.[154]

There is additional scope for control in the coastal environment due to the ability for increased stringency in order to give effect to Policy 15 of the NZCPS. However, an attempt to introduce more stringent provisions to address coastal landscape effects in a more general sense (without a focus on formally identified areas) may be met with opposition given that the protection of identified areas is the approach of the NESPF's provisions specific to ONLs and visual amenity landscapes. It is also likely to be more difficult to prove that increased stringency is required as the size and generality of the area subject to control increases from, for example, a specific ONL to an entire coastline.

Secondly, controlled activity status for afforestation proposed in a visual amenity landscape does not give councils any real ability to control effects on those landscapes. This is because, as a controlled activity, resource consent must be granted.[155] Although councils have the ability to impose conditions in respect of matters over which control is reserved, those conditions cannot be so onerous so as to frustrate (effectively negate) the consent. Because there is no ability for councils to adopt more stringent provisions to control impacts on visual amenity landscapes, afforestation in these areas cannot be avoided and councils are restricted to 'tinkering around the edges' in an effort to try and ameliorate effects.

Thirdly, there is no ability to control the effects of plantation forestry adjacent to visual amenity landscapes. This issue extends past afforestation to control and management of operational activities. Controlling the effects of plantation forestry adjacent to an ONL is theoretically available via the increased stringency provisions.

The lack of value placed on visual amenity landscapes is a significant gap. These landscapes are generally identified due to their significance to local communities, forming an important part of their background and heritage. They are the landscapes that New Zealanders "*commonly inhabit, work in, and travel through*".[156] As a result, their protection is important. Plantation forestry comes with significant visual impacts, but also other impacts on amenity such as reduced access, noise, and traffic.

Fourthly, the NESPF does not directly control the effects of plantation forestry on the natural character of the coastal environment. Although there is flexibility for councils to adopt more stringent provisions for this purpose, it places the onus back on councils to develop and pursue appropriate controls, and justify when greater stringency is warranted. This, as discussed, is likely to have its challenges. There is no clear reason why natural character has been treated differently to landscape given the trend in identification of outstanding and high natural character areas, and the equally strong direction in the RMA and NZCPS regarding their preservation.

RECOMMENDATIONS

Recommendations to address the issues raised above are:

- Alongside the matters already included in Regulation 6, provide councils with the flexibility to apply greater stringency to:
  - Protect landscapes and natural character when specific landscape or natural character areas have not been identified in regional policy statements and plans
  - Protect visual amenity landscapes
- Include amendment of the definition of ONLs to capture situations where they have not been identified in a plan but rather are identified by case-by-case application of criteria (as per the approach to SNAs) as an issue to be considered in the NESPF review.
- Amend the activity status for afforestation proposed to occur in a visual amenity landscape from controlled to an activity status which provides councils with the ability to decline consent.
- Develop and incorporate provisions, or amend existing provisions, to control effects on landscape and natural character from adjacent plantation forestry.
- Insert analogous provisions for natural character areas as included for ONLs and visual amenity landscapes (as recommended to be amended).
- Undertake a review of other amenity effects associated with plantation forestry. For effects intended to fall outside scope of the NESPF, consider whether that should be expressly stated in the NESPF. For effects intended to fall within scope of the NESPF, consider adoption of additional controls as necessary to manage those effects. Amend the NESPF as required.

Picton

10 Structure and language

THE CURRENT NESPF: WHAT DOES IT SAY?

Some matters are outside the scope of the NESPF. Expressly excluded are "*vegetation clearance that is carried out before afforestation*" and "*any activities or general provisions and conditions not specified in regulation 5(1)*".[157] Councils may also continue to control activities and effects not covered by the NESPF (see the 'The Current NESPF: A General Outline' section).

Many of the activities controlled by the NESPF are permitted, subject to compliance with standards. The NESPF thus places a great deal of reliance on these standards (in terms of their effectiveness, clarity, and enforceability), and on forestry operators' compliance with them, including compliance with requirements to submit management plans for certain activities.

MPI has developed guidance to assist with the implementation of the NESPF.

DOES IT WORK?

There is likely to be uncertainty while the NESPF is being implemented as to whether it controls particular effects or not. Examples of effects that are not controlled by the NESPF are transport effects, effects on water yield, and effects on cultural values; but this is only apparent from the lack of provisions to address these matters in the NESPF and from reading the background documents. Recourse to background documents such as evaluation reports and submission summaries will be required in order to determine whether a matter is within the scope of the NESPF or not. This is not particularly satisfactory in the context of regulations.

In an attempt to provide for most aspects of plantation forestry as permitted activities, the NESPF strains the ability of the permitted activity framework to adequately deal with the matters it intends to control.

Jurisprudence directs that qualifying standards for permitted activities must be clearly specified and capable of objective attainment.[158] Some of the permitted activity standards within the NESPF do not appear to meet the legal standard of certainty required. For example, sediment from forestry activities has significant cumulative impacts on receiving freshwater and marine environments. In relation to this potential effect, the relevant NESPF provision for earthworks says:

> *26 Permitted activity conditions: sediment*
>
> *Sediment originating from earthworks must be managed to ensure that after reasonable mixing it does not give rise to any of the following effects on receiving waters:*
>
> *(a) any conspicuous change in colour or visual clarity:*
>
> *(b) the rendering of fresh water unsuitable for consumption by farm animals:*
>
> *(c) any significant adverse effect on aquatic life.*

"*Reasonable mixing*" is not defined. What constitutes a "*significant adverse effect on aquatic life*" entails a degree of judgement that makes the standard incapable of objective interpretation. Issues with this standard and others that are similar are further addressed in the 'Fresh and Coastal Water' section.

Other provisions have limited enforceability, as regulators cannot practicably identify non-compliance. For example, fords across rivers are a permitted activity, subject to standards including that:

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

This standard acknowledges the adverse impacts of turbidity on aquatic ecosystems that can occur when fords are used for regular river crossings. However, the permitted activity framework for fords does not provide for the risk of river crossings to be assessed and

outcome-focused conditions to be imposed. In place of such an assessment, this practically unenforceable standard has been used. It is unlikely to be effective in controlling the turbidity effects it is aimed at controlling.

The NESPF aims to be consistent with ss 6(a) and (c) of the RMA by specifying that most forestry activities may not occur as a permitted activity or must be set back from ONLs and SNAs. However, many districts and regions have not identified ONLs or SNAs.[159] The NESPF deals with this in relation to SNAs by defining those terms to include areas that meet criteria in a regional policy statement or plan (areas do not need to be mapped as SNA to be considered as such), but the issue remains for ONLs. While this is an improvement on the notified NESPF, which was limited to mapped SNAs, it still provides for a framework where forestry activities are permitted unless the forestry operator identifies that an area meets regional policy statement or plan criteria as an SNA. An example of where this does not appear to have worked effectively is afforestation within South Marlborough shrubland that is identified as meeting SNA criteria but is not mapped as such within the plan.

Several plantation forestry activities are permitted subject to the forestry operator submitting a management plan to the relevant local authority.[160] Because permitted activity rules cannot reserve discretion to the council to approve or decline plans,[161] compliance with the regulations is achieved simply by submitting the plan. The plan requirements are topic-focused rather than outcome-focused. For example, the forestry earthworks management plan must:

> *(d) describe clearly the management practices that will be used to avoid, remedy, or mitigate risks due to forestry earthworks that have been identified on the map, including the proposed erosion and sediment control measures to be used and the situations in which they will be used, in sufficient detail to enable site audit of the management practices to be carried out:*
>
> *(e) include the following for earthworks management:*
>
> *(i) water run-off control measures:*
>
> *(ii) sediment control measures during construction and during harvest:*
>
> *(iii) the method used to manage excess fill for large-scale cut and fill operations, and if end haul, the proposed disposal location:*
>
> *(iv) methods used to stabilise batters, side cast, and cut and fill:*
>
> *(v) post-harvest remedial work (timing and methods).*

Provided those matters are addressed in the plan, it must be accepted. There is no verification, feedback, or peer-review step. Councils are unable to reject a plan or require changes to it where they consider the plan uses inappropriate methods or is inadequate for some other reason. The same issue arises in respect of the WCC (see the 'Wilding Conifers' section). Compliance monitoring is limited to whether the plan's provisions are implemented, rather than whether mitigation activities are appropriate, or environmental outcomes acceptable.

There is a risk that plan content is 'cut and pasted' from other sites and operations rather than being site-specific.

The unverified management plan approach assumes that forestry operators will submit management plans that are high quality, and which adequately address the environmental risks that they are intended to manage. That assumption is untested, and this 'high trust' model of regulation is unlikely to be warranted across the board.

Hunua

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INTERVIEWS

In writing this report the authors spoke with experts, council representatives, industry representatives, consultants, and mana whenua. The input of everyone spoken with was invaluable and very much appreciated. Interviewees are not quoted nor referenced by name.

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ENDNOTES

1 Reg 2, NESPF

2 For example, the 2017/2016 forestry compliance review undertaken by Marlborough District Council found 50% non-compliance and 20% serious non-compliance, making a total of 70% non-compliance. See Marlborough District Council, 2018.

3 MPI, 2017b, 12

4 New Zealand Forest Owners Association, 2017

5 New Zealand Forest Owners Association, 2017

6 New Zealand Forest Owners Association, 2017

7 Dyck W J, 1997, 6–9

8 Pawson S M et al, 2010

9 New Zealand Freshwater Sciences Society, Submission on the NESPF.

10 It also does not set out the relationship between NPSs and NESs.

11 ss 43, 44A RMA

12 s 43(1)(a)–(c) RMA

13 s 43(2) RMA

14 s 43A RMA

15 s 43A(3) RMA

16 s 44A(2) RMA. The same applies to bylaws: s 43E RMA. Designations are treated differently. A designation prevails over a NES until either it lapses or one (or more) of its conditions to which the NES is relevant is altered. A NES also prevails over an existing designation if, when the NES is made, there is no outline plan for the designation: s 43D.

17 s 43A(4) RMA

18 That is, if it is classified as controlled, restricted discretionary, discretionary, or non-complying.

19 That is, a regional or district plan could not simply install a controlled, restricted discretionary, discretionary, or non-complying consent requirement. It could include a permitted standard specifying, for example, that the activity must not occur in a specific area, with failure to comply resulting in a consent requirement.

20 s 5 RMA

21 *Environmental Defence Society Inc v New Zealand King Salmon Company Ltd* [2014] NZSC 38 at [85]

22 Being the part setting out the RMA's purpose and principles.

23 MPI, 2016, 3

24 Reg 5

25 Reg 3 definition: "*(a) means planting and growing plantation forestry trees on land where there is no plantation forestry and where plantation forestry harvesting has not occurred within the last 5 years; but (b) does not include vegetation clearance from the land before planting.*"

26 Reg 3 definition: "*means pruning plantation forest trees and thinning to waste involving the selective felling of plantation forest trees within a stand where the felled trees remain on site.*"

27 Reg 3 definition: "*(a) means disturbance of the surface of the land by the movement, deposition, or removal of earth (or any other matter constituting the land, such as soil, clay, sand, or rock) in relation to plantation forestry; and (b) includes the construction of forestry roads, forestry tracks, landings and river crossing approaches, cut and fill operations, maintenance and upgrade of existing earthworks, and forestry road widening and realignment; but (c) does not include soil disturbance by machinery passes, forestry quarrying, or mechanical land preparation.*"

28 Reg 3 definition: "*(a) means a structure that is required for the operation of a plantation forest and provides for vehicles or machinery to cross over a water body; and (b) includes an apron and other structures and materials necessary to complete a river crossing; but (c) does not include a stormwater culvert or a culvert under a forestry road or forestry track.*"

29 Reg 3 definition: "*(a) means the extraction of rock, sand, or gravel for the formation of forestry roads and construction of other plantation forestry infrastructure, including landings, river crossing approaches, abutments, and forestry tracks,—(i) within a plantation forest; or (ii) required for the operation of a plantation forest on adjacent land owned or managed by the owner of the plantation forest; and (b) includes the extraction of alluvial gravels outside the bed of a river, extraction of minerals from borrow pits, and the processing and stockpiling of material at the forest quarry site; but (c) does not include earthworks, mechanical land preparation, or gravel extraction from the bed of a river, lake, or other water body.*"

30 Reg 3 definition: "*(a) means felling trees, extracting trees, thinning tree stems and extraction for sale or use (production thinning), processing trees into logs, or loading logs onto trucks for delivery to processing plants; but (b) does not include— (i) milling activities or processing of timber; or (ii) clearance of vegetation that is not plantation forest trees.*"

31 Reg 3 definition: "*(a) means using machinery to prepare land for replanting trees, including root-raking, discing, ripping, roller crushing, clearing slash, and mounding the soil into raised areas; but (b) does not include— (i) the creation of alternating drains and planting mounds using a V-shaped blade attached to the front of a bulldozer; or (ii) earthworks or forestry quarrying.*"

32 Reg 3 definition: "*means the planting and growing of plantation forestry trees on land less than 5 years after plantation forestry harvesting has occurred.*"

33 Reg 6

34 MPI, 2017b, 8

35 Reg 3

36 Regs 14, 54

37 Regs 17, 61

38 MPI, 2017b, 88

39 MPI, 2017b, 88; 2017a, 4.10.1

40 See Section AA, NPSFM

41 See Appendix 1, NPSFM

42 See Appendix 1, NPSFM

43 See Policy 15(c)(viii), NZCPS

44 The two other main types of abatement are reducing domestic emissions and international purchasing of emission reductions.

45 Office of the Minister for Climate Change, 2018

46 Regs 8–17, 62–71, 76–81

47 Ministry for the Environment, 2010, vii

48 Of course, as discussed elsewhere in this report, the resource consent process can protect environmental values that are ignored by a narrow alignment analysis.

49 Reg 3

50 See Forestry Reference Group, 2018

51 Ministry for the Environment, 2010, vii

52 Te Uru Rākau–Forestry New Zealand, 2019

53 Lindenmayer D B et al, 2012

54 Pinkard L, 2010

55 Reg 5(3)

56 Reg 3

57 Reg 3

58 Reg 3

59 Regs 12, 14, 16

60 Regs 30, 55

61 Reg 43

62 Reg 78

63 Schedule 4

64 These are required for earthworks involving more than 500m² of soil disturbance in any 3 month period.

65 Schedule 3, Clause 3(3)

66 Reg 27(2)

67 Reg 55

68 Reg 59

69 North Island brown kiwi, Eastern falcon, Bush falcon, North Island weka, and any indigenous bird species classified as Nationally Critical, Nationally Endangered, or Nationally Vulnerable.

70 Reg 102

71 Reg 3

72 Reg 40

73 Reg 91

74 Reg 6

75 *Director-General of Conservation v Invercargill City Council* [2018] NZEnvC 175 at [36]

76 Reg 93

77 Specific examples include long-tailed bats roosting at Waiotapu in Kaingaroa Forest, and a population of Hochstetter's frogs inhabiting an area within plantation forest in Rodney District, Northland. Other species known to use plantation forest include various skink and gecko species and many invertebrates including *Powelliphanta* snails and peripatus.

78 At Iwitahi (Kaingaroa Forest) 36 species of native orchids grow within an area of plantation forestry.

79 Scion, 2015

80 The example of the Eyrewell beetle (only 10 individuals ever found, the 5 most recent findings from a Canterbury plantation forest) was described recently; see Hancock, F, 2018a

81 FSC, 2013, Indicator 6.24

82 Indicator 6.2.12

83 Indicator 6.2.13

84 Indicators 6.2.14 and 6.2.15

85 Criterion 10.5

86 Peterson P and E Hayman, 2008

87 Ministry for the Environment and Statistics New Zealand, 2015

88 Gillespie P, 2007

89 Reg 3

90 Reg 14(3)

91 Reg 3 definition: "*means a river that is a continually or intermittently flowing body of freshwater, if the intermittent flows provide habitats for the continuation of the aquatic ecosystem.*"

92 Reg 68

93 Reg 74

94 Reg 78

95 Significant natural areas are subject to a permitted activity control relating to deposition, which is addressed below.

96 Reg 29

97 Reg 54

98 s 70(1) RMA: "*Before a regional council includes in a regional plan a rule that allows as a permitted activity—*

(a) a discharge of a contaminant or water into water; or

(b) a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water,—

the regional council shall be satisfied that none of the following effects are likely to arise in the receiving waters, after reasonable mixing, as a result of the discharge of the contaminant (either by itself or in combination with the same, similar, or other contaminants):

(c) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials:

(d) any conspicuous change in the colour or visual clarity:

(e) any emission of objectionable odour:

(f) the rendering of fresh water unsuitable for consumption by farm animals:

(g) any significant adverse effects on aquatic life."

99 Regs 26, 65, 74, 90

100 Regs 31, 32, 67, 74

101 Regs 20, 30, 55, 68

102 Regs 20, 69

103 Reg 30(2)

104 Reg 55(1)

105 Reg 68

106 Except in earthflow terrain: Reg 60(3)

107 Regs 27, 59, 66, Schedule 3

108 Reg 39(a)

109 Reg 40

110 Regs 41, 42

111 Reg 43

112 Reg 44(a)

113 Reg 44(b), (c)

114 Reg 44(d)–(f)

115 Reg 45

116 Reg 84

117 Reg 85

118 Reg 86(1)

119 Reg 86(1)

120 Reg 86(1)

121 Reg 87

122 Reg 89(a)

123 Reg 89(b), (c)

124 Reg 89(d)–(f)

125 Reg 90

126 Davies-Colley R J et al, 2000; Reeves P et al, 2006; Parkyn S M et al, 2003; Parkyn S, 2004; Daigneault A J et al, 2017

127 See the 'Structure and Language' section.

128 Wyeth J, 2018, 9.10

129 Reg 31

130 *Hawkes Bay and Eastern Fish and Game Councils v Hawkes Bay Regional Council* [2014] NZHC 3191

131 'Objectives' in this context means both policy objectives and numerical objectives developed under Part C NPSFM and the National Objectives Framework. This conclusion is reached due to the changes from the draft NESPF, which referred only to a "*freshwater objective*," to the gazetted version which refers to objectives generally.

132 Noting that specific activity statuses are recommended under the 'Erosion' section.

133 For example, Regs 35(2a), 73(2c, 2d), 75(1b)

134 Reg 66(3)

135 For review, see Satchell D, 2018

136 Hill R and I Blair, 2005

137 See Satchell D, 2018

138 Reg 3

139 Noting that depending on the location and species used this may not necessarily be consistent with achieving wider indigenous biodiversity outcomes.

140 Phillips C et al, 2018

141 Regs 11, 16

142 Reg 11(5)

143 Reg 79

144 Regs 17, 81

145 Reg 6(2)

146 Reg 11

147 Newsroom, *New Zealand's Super Sized Weed Problem,* www.newsroom.co.nz/2018/11/14/320273/nzs-super-sized-weed-problem.

148 Reg 3.

149 Reg 12, 17(1)(c)

150 Reg 13, 15(4)

151 Regs 14, 53, 54

152 Noting that this approach has its own issues, as discussed in the 'Structure and Language' and 'Indigenous Biodiversity' sections.

153 The Kaipara District Plan, Auckland Unitary Plan, Thames-Coromandel District Plan (proposed), Waipa District Plan, Waitaki District Plan, Marlborough Environment Plan (proposed), Gore District Plan, Mackenzie District Plan, and Wellington City District Plan had not, and it does not appear that the Regional Policy Statement or Natural Resources Plan (proposed) do either.

154 An example of a plan that does is the Marlborough Environment Plan (proposed).

155 s 87A(2) RMA

156 Brown S, 2003

157 Reg 5(1) sets out the activities the NESPF applies to

158 *Maclean v Thames-Coromandel District Council* A046/03 at [19]–[21]

159 For example, Marlborough, Tasman, Nelson, Thames-Coromandel have not identified SNAs.

160 Reg 27 forestry earthworks management plan, Reg 58 quarry erosion and sediment management plan, Reg 66 harvest plan.

161 *Bryant Holdings Ltd v Marlborough District Council* [2008] NZRMA 485 (HC)

Annexure 2

Environmental Defence Society

12 January 2023

Media Release
EDS calls for Formal Inquiry into Forestry Practices following East Coast disaster

The Environmental Defence Society says that the latest disaster on the East Coast needs a formal Commission of Inquiry into forestry practices.

"We have seen yet again the consequences of inadequate controls over exotic plantation forestry operations, with massive inundation of private property by slash and debris from upstream forestry land," says EDS CEO Gary Taylor.

"Entire houses at Tolaga Bay have been smashed to smithereens, rivers and streams completely blocked with debris causing extensive flooding of property, and bridges and beaches covered with massive quantities of slash. This is completely unacceptable. It is a repeating occurrence and must have legal consequences.

"The wider context includes several recent prosecutions of forestry companies for breaching even the weak regulatory regime that currently applies. The courts have slammed operators not only for their breaches, but also their cavalier attitudes.

"The Government is currently reviewing the National Environmental Standards for Plantation Forestry, but the limited terms of reference mean it will only result in tinkering of the rules applying to plantation forestry. Agencies seem in thrall to the sector which is dominated by offshore interests which are powerful and influential. Industry representatives, with clear conflicts of interest, dominate the Government review of the Forestry Industry Transformation Plan.

"It is time for a full-blown, independent Commission of Inquiry to take a fresh look at the sector, the rules that govern it, whether clear-felling with its adverse consequences should continue, and where liability should lie for any and all offsite damage such has occurred at Tolaga Bay.

"It is patently unjust that private landowners and councils should bear those costs.

"A formal inquiry is urgently needed because these extreme weather events will become more frequent with climate change. A Commission of Inquiry with all its powers, including those to subpoena witnesses, is required to undertake a proper investigation into the forestry sector. A reset in this area is well overdue," Mr Taylor concluded.

More: Gary Taylor 021 895 896

Environmental Defence Society

Annexure 3

16 January 2023

Media Release
EDS calls for Minister Nash to rethink an Inquiry into plantation forestry

The Environmental Defence Society is calling on the Minister of Forestry, Hon Stuart Nash, to think again about the merits of an independent Inquiry into exotic forest planting and harvest methods.

"On Morning Report today, Minister Nash said there was no need for such an inquiry. But he couldn't explain away the very serious policy failings revealed by the disaster on the East Coast," said EDS CEO Gary Taylor.

"The reality is that the public has lost confidence in the commercial plantation forest sector because these events keep happening. There has also been a series of recent prosecutions of forest companies in which the Courts have slammed the performance and cavalier attitude of forest managers. The sector has no social license to continue operating in a way that leads to sediment and slash pollution across large swathes of Aotearoa New Zealand.

"Ironically, the President of the Forest Owners Association, as recently as November last year, criticised EDS for raising concerns about the environmental performance of the sector:

> *"Grant Dodson says the Environmental Defence Society has failed to provide any evidence of 'significant adverse environmental impacts' 'in most instances' from when plantation forests are harvested. ...*
>
> *Just look at the effect of the recent storms on the East Coast, where forests held and pasture collapsed on a vast scale. The evidence is there to see in plain sight."*[1]

"The evidence is indeed there in plain sight and it's time for FOA and Minister Nash to front up and accept that, with climate change increasing the severity and frequency of high rainfall events, the old way of managing plantation forests isn't good enough anymore. The days of clear-felling are over. Environmental regulations need tightening.

"The Minister should focus on the interests of the wider public and accept that a fundamental reset of the policy framework is urgently required. The present tinkering with the National Environmental Standards for Plantation Forestry isn't going to address the much bigger issue of continuing environmental harm. The present regulatory agencies are overseeing a failing regime and can't be relied upon to come up with effective solutions.

"An independent Public Inquiry under the Inquiries Act 2013 is needed to recommend what a modern regime for plantation forestry, that is fit for purpose in a climate-changing world, should look like.

"We respectfully call on Minister Nash to think again," Mr Taylor concluded.

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[1] https://www.nzfoa.org.nz/137-news/foa-news/foa-media-releases-2022/1701-wooden-cities-key-to-cutting-worldwide-carbon-emissions-to-combat-climate-change-4

Te Uru Rākau
Forestry New Zealand

Annexure 4

Report on the Year One Review of the National Environmental Standards for Plantation Forestry

Prepared for Forestry Ministers
By Te Uru Rākau

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Contents

Page

Report on the Year One Review of the National Environmental Standards for Plantation Forestry

1. Executive Summary

The National Environmental Standards for Plantation Forestry (NES-PF) are regulations under the Resource Management Act 1991 (RMA). They came into force on 1 May 2018 and apply to any forest of at least 1 hectare that has been planted specifically for commercial purposes and will be harvested. This means that the NES-PF do not apply to permanent forests planted solely for the sequestration of carbon.

The NES-PF was developed during a time when net deforestation was occurring, and well before the One Billion Trees programme and reforms to the Emissions Trading Scheme. Those programmes have significantly changed some of the incentives for forest planting and attracted new entrants to the broader forest sector.

In December 2018, Forestry Ministers asked Te Uru Rākau and the Ministry for the Environment to carry out a review of the NES-PF that considered the matters agreed in the Terms of Reference (Appendix One).

We have found that, overall, the NES-PF is effective, but some changes could be made to improve environmental outcomes in some areas.

Further implementation support for councils and the forestry sector is required to lift performance and compliance, including:

- Specific guidance and training to improve compliance with wilding conifer controls, slash management, and the use of stringency; and

- Better national data on permitted activities, consent applications, and risk-based monitoring – this will allow development and implementation of a nationally consistent compliance, monitoring, and enforcement framework.

Changes to the regulations could improve environmental outcomes in some areas, including changes to the:

- Wilding Tree Risk Calculator to adjust some of the settings in the calculator, align how afforestation and replanting are treated, and strengthen the requirements about who is qualified to use it (refer to Section 4);

- Slash management provisions to clarify and strengthen the controls and improve management of slash (refer to Section 5); and

- Biodiversity provisions to improve clarity and accountability (refer to Section 6).

The making of any changes to the NES-PF regulations must comply with RMA requirements, including a public consultation process for changes that are more than minor or technical.

2. Background

2.1. OVERVIEW

The National Environmental Standards for Plantation Forestry (NES-PF) came into force on 1 May 2018.

The objectives of the NES-PF are to:

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

At that time, net deforestation was occurring, and initiatives such as the One Billion Trees programme and Emissions Trading Scheme were yet to incentivise forest planting and attract new entrants to the broader forest sector. In December 2018, Forestry Ministers asked Te Uru Rākau and the Ministry for the Environment to carry out a review of the NES-PF that considered the following matters in the Terms of Reference:

Implementation issues

a. The extent to which councils have aligned their plans with the NES-PF (as required by section 44A of the RMA), and where they have applied more stringent rules than those in the NES-PF, as enabled through regulation 6;

b. The way in which charging to monitor permitted activities has been implemented, and the impact (if any) this is having on councils and foresters and the objectives of the NES-PF;

c. The issues and trends that have arisen from implementing the regulations during the first year;

d. Whether changes are required to the three decision support tools incorporated by reference in the NES-PF (the Erosion Susceptibility Classification, the Fish Spawning Indicator, and the Wilding Tree Risk Calculator), including whether the Wilding Tree Risk Calculator can be made into a spatial tool; and

e. Whether foresters operating under existing resource consents, or who have existing use rights under section 10 of the RMA, can be subject to controls under the NES-PF.

Specific issues that have arisen since gazettal

f. Whether the settings in the NES-PF relating to harvesting and slash management are appropriate for controlling the environmental effects of plantation forestry on erosion-prone land, including whether the controls for ESC orange and red zone land are too narrow;

g. Whether any changes to the afforestation and replanting provisions in the NES-PF are required to ensure it is consistent with the One Billion Trees programme;

h. The wilding tree controls within the context of the government's Wilding Conifer Management Strategy; and

i. Biodiversity protections in the NES-PF, including protections for indigenous flora and mobile fauna such as birds and fish.

The timing of the review was amended by ministerial agreement in March 2020 in recognition of the significant response the forestry sector faced from the COVID-19 disruption; specifically, that public consultation on any proposed changes would need to occur in 2021. This report details our findings from the review.

2.2. THE REVIEW PROCESS

The review commenced in May 2019 after the NES-PF had been in force for one year.

Te Uru Rākau engaged with foresters, councils, and members of the NES-PF Stakeholder Implementation Working Group (SIWG)[1] to understand how the NES-PF were being implemented and any issues that had been identified during the first year.

While a formal public consultation process was outside the scope of the review, advice was sought on specific issues from technical experts, particularly relating to wilding conifer control, slash management, and indigenous biodiversity.

2.3. THE REVIEW CONTEXT

National Environmental Standards (NES) are regulations made under the Resource Management Act (RMA), which may:

- Set out technical standards, methods, or requirements relating to matters under the RMA; and
- May provide consistent rules across the country by setting planning requirements for specified activities.

An NES prevails over district or regional plan rules, except where an NES specifically allows more stringent plan rules.

The NES-PF provides a consistent set of regulations for eight core plantation forestry activities. It sets the conditions under which these can be carried out as permitted activities, and the potential environmental effects that must be managed. Where it is not possible to manage these effects through permitted activity conditions, resource consent is required.

The NES-PF applies to any forest of at least one hectare that has been planted specifically for commercial purposes and will be harvested.

Regional councils are the enforcement authorities for the NES-PF, though district and city councils have functions relating to significant natural areas, noise, dust, and setbacks from roads and dwellings. Due to this, the experience of regional councils has been the primary focus of the review.

The review focuses on the nine matters in the terms of reference, along with the objectives of the NES-PF. Plantation forestry operates within a wide regulatory environment that includes other legislation and several national direction instruments under the RMA. We have considered how the NES-PF aligns with these in its implementation and operation. In several cases there are proposed changes to other national direction instruments and legislation that will require future assessment to ensure alignment with the NES-PF.

[1] SIWG members: Kate Dunlevey (Environment Southland), Dean Evans (Hawke's Bay Regional Council), Sally Gepp (Forest & Bird), Brett Gilmore (Brett Gilmore Consulting); Meg Graeme (Natural Solutions), Oliver Hendrickson – Chair (Te Uru Rākau), Kerry Hudson (Gisborne District Council), Scott Ihaka (Greater Wellington Regional Council), Jack Kos (Fish and Game Council), Patrick Walsh (New Zealand Farm Foresters Association), Kit Richards (PF Olsen), Greg Severinson (Environmental Defence Society), Sally Strang (Hancock Forest Management), Vince Udy (Waikato Regional Council), Peter Weir (Ernslaw One Ltd), and Louise Wood (Taupō District Council).

3. Key Themes in Review Findings

3.1. SOME CHANGES TO THE REGULATIONS COULD BE BENEFICIAL

Overall, the NES-PF has increased regulatory oversight of plantation forestry, and increased attention to good forestry practice, however, changes could improve environmental outcomes in some areas.

Regulatory changes to the NES-PF could improve environmental outcomes, including changes to the:

- Wilding Tree Risk Calculator to adjust some of the settings in the calculator, align how afforestation and replanting are treated, and strengthen the requirements about who is qualified to use it (refer to Section 4);
- Slash management provisions to clarify and strengthen the controls and improve management of slash (refer to Section 5); and
- Biodiversity provisions to improve clarity and accountability (refer to Section 6).

Any changes to the NES-PF must comply with RMA requirements, including a public consultation process for changes that are more than minor and technical.

3.2. GUIDANCE AND TRAINING ARE NEEDED

Guidance and training are needed to improve environmental outcomes and efficiency from plantation forestry activities. Greater clarity about the purpose and intent of the regulations will support the uptake of best practice and enable the development of comprehensive decision-making metrics based on data and evidence collected over time. For example, the initial Wilding Tree Risk Calculator scores together with weather records could in future be compared with compliance and monitoring information to better inform the decisions of councils and foresters concerning species selection.

Councils and members of the forestry sector told us they need support to ensure the regulations are well understood and can be consistently and effectively implemented. Support is particularly important where:

- Councils lack capacity and experience with forestry activities and/or had not provided a high degree of regulatory oversight prior to the NES-PF coming into effect; and
- Foresters and forestry contractors, particularly farm-foresters with first rotation forests, lack experience in identifying and managing environmental risks and applying appropriate practice.

Te Uru Rākau has a role in promoting forestry best practice, and forestry-specific environmental management. In order to target implementation support that will enable greater national consistency, better data and evidence is required. Further implementation support for councils and the forestry sector is required to lift performance and compliance, including:

- Specific guidance and training to improve compliance with wilding conifer controls, slash management, and the use of stringency; and
- Better national data on permitted activities, consent applications, and risk-based monitoring. This will allow development and implementation of a nationally consistent compliance, monitoring, and enforcement framework.

3.3. WIDER REGULATORY ALIGNMENT IS IMPORTANT

Plantation forestry as a land use provides a range of beneficial environmental effects, but it can also create some adverse effects. The intent of the NES-PF is to manage the environmental effects of

plantation forestry as a land use, including many of those being addressed through other national direction or legislation.

Councils and foresters have told us that planning processes are becoming more complex as the volume of national direction increases, and that it can be challenging to reconcile the various instruments. Councils are required to implement national direction through their plans. Given the review identified a lack of capacity within some councils to manage the new requirements for forestry, we expect councils, particularly regional councils, will need increased support to align national instruments and regional priorities for land use.

There are currently six national instruments under development that have clear interactions with the NES-PF. These are set out in Table 1 below.

Table 1: Key national instruments that interact with the NES-PF

National instrument	Areas of interaction with NES-PF
Resource Management Act: Amendments to the National Policy Statement for Freshwater Management (NPS-FM)	Sets new attributes[2] for turbidity and deposited sediment.
Resource Management Act Proposed National Environment Standards for Freshwater (NES-F)	The NES-PF and NES-F both require setbacks for wetlands and the provision of fish passage. The conditions vary depending on the relevant activity, with each instrument being more stringent than the other in some regards.
Resource Management Act Proposed National Policy Statement on Indigenous Biodiversity (NPS-IB) (Public consultation in 2019/20)	Sets the policy approach for managing the impact of plantation forestry on significant indigenous fauna and flora. The proposed criteria for significant indigenous vegetation and significant habitats of indigenous fauna are likely to mean the productive area of many plantation forests would be classed as Significant Natural Areas (SNAs). This would require extensive change to the NES-PF and to forestry practice.
Resource Management Act Proposed National Policy Statement on Highly Productive Land (NPS-HPL)	Limits activities in Land Use Capability system (LUC) class 1-3 land. The NES-PF assigns rules for land use based on mass-movement erosion risk, which is a different effect to that governing the NPS-HPL.
Biosecurity Act, including Regional Pest Management Plans made under the Act	Wilding conifer control is carried out under the Biosecurity Act and individual regions set strategies to control pests. When making a Regional Pest Management Plan, a council must be satisfied that the plan is not inconsistent with a regional policy statement or regional plan made under the RMA.
Climate Change Response Act (CCRA), Emissions Trading Scheme (ETS)	The ETS incentivises tree planting, and plantation forests may register to gain New Zealand Units. There are no direct links with the NES-PF, but there is a perception that the ETS drives increased permanent forest planting and that permanent forests are regulated by the NES-PF (which is incorrect).

[2] An attribute is a measurable characteristic of fresh water, including physical, chemical, and biological properties, which supports particular values.

4. Wilding Conifer Management

4.1. WHY ARE WILDING CONIFERS AN ISSUE?

Exotic conifer species grow well in New Zealand and make up 96% of the national plantation forest estate (90% *Pinus radiata*, 6% Douglas fir), with the remainder made up of eucalypts, and other softwood and hardwood species.

However, over time conifers may spread outside the forest itself, causing financial and environmental loss for neighbouring properties.

Wilding conifer spread in New Zealand is extensive and costly to control.

- In 2016, wilding conifer spread affected over 2 million hectares.
- Biosecurity New Zealand and the Department of Conservation are spending over $40 million in the 2020/21 financial year on long-term control and eradication of existing wildings. Regional councils and landowners also have control costs.

Wilding conifer spread in New Zealand is often a legacy of erosion control planting by central and local government, as well as forests and farm shelter belts. *Pinus contorta* and *Pinus nigra* make up a significant part of current wilding spread and these species are no longer used in plantations. However, potential new spread must be controlled to avoid exacerbating the problem.

Douglas fir is a commercial species of significant concern due to its high wilding risk under certain conditions. Some of the areas to which it is best suited are close to areas with high conservation values, which would be compromised by exotic invasion (such as native tussock land). *Pinus radiata* has a lower risk of spread, though it is still an issue in some areas.

Preventing wilding spread requires a systematic approach

The regulatory system can work well where all parties have a good understanding of wilding risk, or the ability to access the correct information.

Managing wilding risk from plantation forests requires a series of steps to be effective:

- Site-specific proposals must be assessed by suitably qualified people using the Wilding Tree Risk Calculator in accordance with the Scion guidelines;
- Where wilding risk is high, resource consent is required, and the council will need suitable forestry and wilding knowledge to set conditions to limit wilding risk;
- Foresters must comply with conditions of the resource consent to limit risk; and
- Where risk changes, or wildings establish despite compliance with conditions, foresters need to comply with broader containment measures through Regional Pest Management Plans.

We have found that there are gaps and issues across the regulatory system that have the potential to result in new wilding establishment. Changes are more likely to substantially reduce wilding risk when they are applied across more than one part of the system.

4.2. SUMMARY OF WILDING ISSUES IDENTIFIED IN THE REVIEW

Issues identified in the review related to:

- Limitations in the Wilding Tree Risk Calculator, which can lead to subjective assessments;

- The resource consent threshold based on the Wilding Tree Risk Calculator score;
- The adequacy of direction provided by the activity status;
- The definition of a 'suitably competent person';
- The limited species covered in the Wilding Tree Risk Calculator, and wording in the regulations that requires consent for species that aren't covered;
- Insufficient experience and knowledge of wilding conifer risk and risk assessment in some councils, exacerbated by insufficient local government policy for afforestation and wilding control; and
- Unclear wording in the NES-PF, or wording that does not give effect to intent.

4.3. WILDING CONIFER MANAGEMENT

New Zealand's forestry industry is largely based around sustainably managed plantation forests, with most planted species being coniferous evergreen trees. About 90% of our plantation forests are radiata pine. The remainder are Douglas fir (6% of plantation area), eucalypts, and other softwood and hardwood species.

New Zealand has a significant legacy issue with wilding conifers, and eradicating those trees is expensive and ongoing. Legacy wilding conifers are regulated under the Biosecurity Act 1993 and through the subsequent rules in Regional Pest Management Plans. *The Right tree in the right place: The New Zealand wilding conifer management strategy 2015-2030* (WCMS) is a non-statutory strategy which supports collaborative action between land occupiers, researchers, regulators, and communities to address the critical issues facing wilding conifer management. The Ministry for Primary Industries (MPI) led the development of the strategy in collaboration with a multi-stakeholder working group. The strategy identifies actions for key parties involved in wilding conifer management under four principles: individual and collective responsibility, cost-effective and timely action, prioritisation, and coordination.

The WCMS provides the framework for the National Wilding Conifer Control Programme, which aims to prevent the spread of wilding conifers and to progressively remove them from land already invaded. MPI, the Department of Conservation, and Land Information New Zealand are leading the work, with support from other central and local government agencies. Forestry and farming industries, landowners, researchers, and communities are also providing support.

The oversight of research, policy, and management is undertaken by the New Zealand Wilding Conifer Management Group. As an Incorporated Society, the New Zealand Wilding Conifer Management Group aims to raise awareness of the wilding conifer issue, advocate for funding for wilding conifer control, and provide nationwide coordination of, and advice to, community groups involved in wilding conifer management.

The NES-PF does not regulate the management of legacy wilding conifers, but it does regulate wilding conifer risk for new plantation forests. The NES-PF is supported by the powers and functions that the RMA provides councils. These powers include the ability to make plan rules for matters outside the scope of the NES-PF, impose and monitor resource consent conditions, review the conditions of a resource consent, and take enforcement action.

The One Billion Trees (1BT) programme and the Emissions Trading Scheme (ETS) both provide incentives to plant trees but use the NES-PF process to determine whether a proposal has managed wilding conifer risk adequately. This means the accuracy of risk estimation in the NES-PF process will affect these programmes.

The WCMS, NES-PF, ETS, and 1BT programmes all seek to prevent new afforestation generating new wilding problems. The policies in these programmes need to work together to achieve a

coordinated outcome relating to wilding conifers, ensuring they can be operationalised by foresters, councils, and central government.

4.4. HOW THE NES-PF CONTROLS WILDING CONIFERS

The intention of the NES-PF standards is to recognise that risk varies according to the characteristics of the site and species used, and to manage these risks appropriately. These standards replaced any wilding conifer spread risk rules (for afforestation) in existing resource management plans, and provided clarity where plans were silent. The standards that relate to wilding management are detailed below.

- Regulation 11: Any person seeking to afforest[3] with a conifer species must have a suitably qualified person[4] calculate a wilding tree risk score and provide a copy of that score to the relevant council no more than six months before notice of afforestation. It must be calculated in accordance with the Wilding Tree Risk Guidelines, which were developed by Scion in 2012. If the score is 11 or less, the afforestation activity may be carried out as a permitted activity.

- Regulation 11(5): Permitted activity control measures require that wilding conifers that have established in significant natural areas or wetlands be eradicated at least every five years after afforestation. However, this only applies to the forest property or adjacent properties with the same owner(s). This is because an NES cannot authorise a person to enter onto someone else's land.

- Regulation 16: If the score is 12 or more, the activity may only be carried out if the council grants a restricted discretionary resource consent (the risk rating range is 1 to 21). The council may refuse that consent.

- Regulation 79: If replanting an existing site in a different conifer species, the assessment under regulation 11 must be undertaken. Although wilding risk is an issue for existing forests, the NES-PF permits the planting of the same species in the same place to give people a degree of certainty, like an existing use right. This was an important feature of the policy behind the NES-PF. Existing use rights as defined by section 10 of the RMA do not apply because wilding tree risk and control are controlled as regional activities in the regulations.

When a consent is required under the NES-PF, the council considering the consent may consider 'the mitigation proposed to restrict wilding conifer spread, including the species to be planted'. Although a council can't impose a condition in a resource consent to require a third party (i.e. a neighbour) to do or not do something, neighbours may agree suitable access conditions, so the council may have the discretion to make wilding removal on neighbouring properties an ongoing condition of the consent. This is more likely to happen if the forest owner is required to either notify the neighbour or obtain a written approval. However, it also increases the risk that a neighbour impedes an afforestation proposal for reasons other than wilding risk, because they don't want a forest next door.

If a wilding risk calculator score is 12 or more, the default resource consent activity status is restricted discretionary, which means the council has discretion to refuse the consent. We consider these matters to be sufficiently broad to allow for a wide range of conditions (specifically, the level of wilding risk, the mitigation proposed to restrict wilding conifer spread, including the species to be planted, and information and monitoring requirements). The activity status provides councils with power to refuse or place conditions on an application.

[3] Afforestation means planting and growing plantation forestry trees on land where there is no plantation forestry and where plantation forestry harvesting has not occurred within the last 5 years.

[4] This means a person with (a) tertiary qualifications in silviculture and forest ecology and at least 2 years' experience in the field of silviculture; or (b) at least 5 years' experience in silviculture that includes forest establishment.

4.4.1. System alignment – other wilding requirements

Foresters are also required to comply with the requirements of instruments made under the Biosecurity Act 1993, including regional pest management plans. For example, pest management plans prohibit the planting of *Pinus contorta*.

The NES-PF definition of a plantation forest includes the words 'for harvest', meaning 'permanent forests' are not covered by the NES-PF. RMA controls for these forests remain within the authority of councils, including wilding risk and any other environmental effects that the council considers require control. However, it is very likely that many councils are not aware of this as they may assume the NES-PF covers all planted forests.

It is also possible that permanent forest planted with conifer species will fall under the mandate of the relevant Regional Pest Management Plan. Most of these now include wording provided by Biosecurity New Zealand to the effect that 'wilding conifers' are a pest species, and the term refers to 'any introduced conifer tree … unless it is located within a plantation forest, and does not create any greater risk of wilding conifer spread to adjacent or nearby land than the plantation forest that it is a part of.'

4.5. REVIEW PROCESS AND ANALYSIS OF IDENTIFIED ISSUES

It is difficult to assess the performance of the wilding control settings in reducing spread after only 18 months. Coniferous trees typically produce their first cones at 8-10 years of age, and there is a long lag phase where the impacts of spread are not felt for many years after initial spread occurs. This lag means it is not possible to assess what effect the NES-PF rules have had in achieving the intended purpose of reducing spread risk at afforestation.

We considered user feedback from selected councils and other stakeholders who have raised concern about performance issues with the calculator and the suitability of wilding control policy settings. This includes members of the NES-PF Stakeholder Implementation Working Group, the Wilding Conifer Governance Group, and wilding experts including foresters. Potential options to address issues were also tested with these groups. We also considered a small number of Wilding Tree Risk Calculator scores, but it is almost impossible to draw conclusions from paper-based scores without making site visits and this was beyond the scope of the review.

4.5.1. Issues relating to the Wilding Tree Risk Calculator

The Wilding Tree Risk Calculator (the calculator) was developed as a decision support tool to guide better afforestation decisions and is referenced in the New Zealand Wilding Conifer Management Strategy (WCMS). It is used in the NES-PF to assess the risk of wilding spread and sets a threshold for when resource consent is required for afforestation. Assessment of spread risk is based on:

- Spreading vigour of the conifer species;
- Palatability of seedlings to grazing stock;
- Exposure of planting site to prevailing winds;
- Downwind land use; and
- Downwind vegetation cover.

Scion developed guidance[5] for the use of the calculator, and the regulations require that a calculator score must be calculated in accordance with this guidance. The guidance sets out the multiple criteria that should be considered to ensure a site-specific assessment is carried out.

[5] Guidelines for the use of the Decision Support System 'Calculating Wilding Spread Risk from New Plantings,' Scion June 2015.

Calculator is underpinned by criteria that can be subjectively applied

The calculator can be complicated to apply as several of the criteria are subjective in nature, require expert knowledge to assess, or are subject to change over the lifecycle of a plantation forest (which typically ranges from 25-45 years). This can result in inconsistencies at a regulatory level, where a high degree of certainty of wilding conifer risk mitigation is important.

The calculator underestimates the spread risk of Douglas fir

Douglas fir is a conifer species that thrives in places that *Pinus radiata* does not. It is planted primarily in the South Island and in high-country areas as it is tolerant to frosts and heavy snow loading. It has a high risk of wilding spread, as its cones are lighter than some other species and grow towards the ends of branches and are thus easily spread by wind. The areas in which it is preferred to other species (high, dry, and cold) are more likely to be dryland ecosystems, including tussock and farmland.

Douglas fir plantations make up approximately 6% of the New Zealand plantation forest estate by area,[6] with the majority in the South Island. Tree stock sales for Douglas fir in the 2018 survey show a significant decrease over time for Douglas fir seedlings (from 5.1 million seedlings in 2011 to 1.4 million in 2018).[7] This was understood by the surveyors to be a response to concern about wilding potential as well as increased interest in the *Pinus attenuata/Pinus radiata* hybrid, which grows in similar conditions to Douglas fir but appears to have a lower wilding risk and faster growth.

It is not known yet whether the requirements of the NES-PF have influenced planting of Douglas fir. Any effect is likely to be obscured by general economic drivers, including changes to the carbon price and the relative value of forestry and marginal farmland.

Some South Island councils and wilding control groups are concerned that the NES-PF under-estimates the risk associated with Douglas fir plantations. Douglas fir requires some drought stress during bud formation in late summer to ensure cone buds are formed in the following season, so wilding risk is low in moister areas.[8] To accommodate this, the calculator allows for a lower score (1) in wetter parts of New Zealand. However, it does not provide any independent criteria that would enable foresters and councils to determine whether an area is 'high moisture' for the purpose of the calculator.

This illustrates a wider concern about the treatment of climate by the calculator. Douglas fir as a species automatically scores 7 out of a potential 9 (4 for spreading vigour and 3 for palatability), so it is only able to score 4 more points to remain as a permitted activity, which means it must achieve low scores for siting and downwind uses.

We are aware that some South Island councils have asked foresters to revisit assessments where the lower score has been used for areas they consider to be drought-prone. An assessment may be made in good faith during wetter years where risk appears low, but over the 45-year life of the forest this may not adequately reflect drought and therefore wilding risk in a warming climate.

The calculator does not provide score reduction for lower-risk alternative species

As understanding of the risk of wilding spread from Douglas fir has grown, there has been renewed interest in the use of a hybrid of *Pinus radiata* crossed with *Pinus attenuata.*[9] This hybrid has similar climatic tolerance to Douglas fir, but a wilding spread risk similar to *Pinus radiata.*[10]

The planted extent of this species is currently low. However, nursery sales indicate planting is increasing, particularly as a buffer species for primarily Douglas fir forests. Further work is needed to

[6] National Exotic Forest Description, Ministry for Primary Industries 2019.

[7] Provisional results for 2019 show an increase in Douglas fir to 1.9 million seedlings.

[8] Scion, op cit, p.10.

[9] 'A promising new species option for inland South Island sites – hybrids of *Pinus attenuata* with *Pinus radiata*,' Dungey, Low and Burdon 2013, *New Zealand Journal of Forestry*.

[10] Thomas Paul, pers. comm. (29 October 2019).

develop commercial demand, including enabling enough supply to incentivise conversion of current processing infrastructure to provide the forestry sector with the confidence to use the species more widely. Given the long-term nature of forest cycles and investment, it will be some time before we know what place this hybrid species has in the industry.

The NES-PF permits the use of tree species, provided the wilding calculator and on-site assessment indicates a wilding risk score of 11 or less. As a precaution, species not listed on the calculator require a resource consent for afforestation, but this may act as a disincentive to use of the hybrid. Scion is seeking to understand the risk profile of the hybrid species in greater detail before including it on the wilding calculator. We understand this work will take several years to complete.[11]

Land use is likely to change over time

The calculator only allows for an assessment of a site and the surrounding land use as it exists at the time of assessment. However, the surrounding land use may not remain static for the plantation forestry cycle. It may change in response to market demand, or landowner preferences.[12]

Land use change can increase the risk of wilding spread as existing mitigations may change, particularly grazing patterns. Changes in grazing pressure may be more prevalent in drought years where farmers move stock away from drier areas, and this is when spread risk increases naturally for Douglas fir.

4.5.2. Issues with application of the calculator

Current documentation requirements do not provide confidence in assessment

The NES-PF requires foresters to provide a copy of the Wilding Tree Risk Calculator score to councils. A score sheet is included in the guidelines, but the regulations do not require additional documentation to be provided, outlining how the assessment was undertaken.

Some councils consider this makes a desktop assessment of site risk more difficult. Providing more detailed assessments may assist councils to understand the risk management approach being taken, particularly for larger sites with varied landscapes. For example, the guidelines specify that where a planting site is made up of areas with different risk profiles, each area needs to be assessed separately. This is a matter of site-specific judgement that can't be regulated with objective criteria.

We understand some foresters are providing additional documentation to councils showing how assessments have been made, some of which has been prepared to a high standard in accordance with the Scion guidance. This level of quality assessment could provide a minimum standard that could be included in the regulations. Clarity in the NES-PF about requirements should improve the quality of assessment and increase confidence that permitted activity conditions have been complied with.

The definition of a suitably qualified person is insufficient to ensure accurate risk assessment

Regulations 11 and 79 of the NES-PF require that the wilding calculator assessment is undertaken by a suitably competent person. This is defined in the regulation as a person with:

> *(a) tertiary qualifications in silviculture and forest ecology and at least 2 years' experience in the field of silviculture; or*
>
> *(b) at least 5 years' experience in silviculture that includes forest establishment.*

The availability of a suitably competent person can be both limited and costly. Wilding assessment can be complex and relies on the assessor having good knowledge of the site over time, or the experience

[11] Thomas Paul, pers. comm. (November 2019).

[12] 'Analysis of drivers and barriers to land use change', Ministry for Primary Industries (2017).

to understand what additional information is required to understand the site, and where to find it. This includes wind and rainfall information at a local scale, and local land-use patterns and planning rules.

The suitably qualified person is providing evidence to support a permitted activity land use over many years, so all interested parties need to have a high level of confidence in the assessor's abilities. Several experts, including foresters, suggested that the assessor should be independent of any funding or consenting process, to remove potential conflicts of interest.

Experts, including council staff, agreed that some councils lacked the experience to assess wilding scores. This means that a resource consent may not be appropriately calibrated to manage wilding risk (potentially being too restrictive of low-risk activities, or insufficiently targeted to reduce high risk).

Several experts, including foresters, suggested that silviculture experience alone is insufficient to guarantee a good understanding of site-specific wilding risk. This is particularly true where the experience was gained overseas or in parts of New Zealand with different conditions.

Conversely, placing too much reliance on a suitably competent person to undertake an assessment may create barriers to establishment of small woodlots in low-risk areas. This is both a cost and capacity issue, particularly where there is insufficient capacity amongst rural service professionals to undertake these assessments.

4.5.3. Policy settings

The policy intent of the wilding provisions of the NES-PF permit plantation forests where the wilding risk is low or can be managed appropriately. This policy intent is effective and does not need to change. However, there are several ways in which the settings in the NES-PF and the Wilding Tree Risk Calculator are not giving effect to this intent, as well as some risks that are not currently managed appropriately.

Permitted activity threshold does not take account of activity to lower spread risk

The regulations specify that a score of 12 or more indicates a high risk of spread from the planted site, and this has been adopted as the threshold for resource consent. A high risk does not mean that trees should not be planted, but resource consent (if granted) can require that additional mitigations be applied. A change of species, siting, or downwind land management can significantly lower spread risk.[13]

The regulations do not specify that a score lower than 12 equates to low risk. One forest sector expert considered scores over 9 of concern because they rely on assessed conditions remaining static over a long period. As noted, grazing of land downwind is an effective way to keep wildings under control, but even a few years without grazing, particularly coinciding with good coning conditions, can enable wildings to establish.

What threshold is suitable to permit afforestation requires further assessment by experts. It has been suggested that the downwind land-use criteria should be removed from the calculator. Given that grazing is an effective control method, any move of this nature would require deeper consideration with Scion. However, where downwind grazing intensity is reduced such that a wilding score would have been greater than 12, some means of realigning risk is required.

Controlling wilding spread on neighbouring properties can't be authorised through a permitted activity

Agreements can be used to ensure that wilding spread is addressed on adjacent land. However, the NES-PF cannot undermine property law to grant access to a property owned by someone else without agreement.

[13] Scion, op cit, p. 22, June 2015.

The requirement under the NES-PF to remove wildings from Significant Natural Areas[14] and wetlands is limited to trees on properties under the same ownership as the source forest because the NES-PF cannot grant access to, or require an individual company to undertake work on, a property under different ownership.

Under the Biosecurity Act, MPI and regional councils can issue directions to require a landowner to remove wilding trees from their property, but this does not extend to issuing notices to the source property.

Where forests have been established as a permitted activity under the NES-PF, there is no requirement to manage spread and remove trees from neighbouring properties. This includes spread that may extend many kilometres from the source site, which makes it difficult to determine the source of the wilding spread. This is another reason to consider a more precautionary consent threshold.

Settings misaligned for replant

Wilding conifer control is treated differently between the afforestation and replant provisions in the NES-PF because the activity of replanting a forest has traditionally had existing use rights, if it is of the same scale and intensity. If replanting with a different conifer species, the same wilding calculator requirements must be met. Except for this difference, the intention was to treat the activities in the same way.

However, regulation 79(6), which sets out requirements for eradicating wildings established in SNAs and wetlands does not include any property limits as set out in regulation 11(5). Because a permitted activity cannot authorise an activity on another person's property the provisions in regulation 11(5) need to be duplicated in regulation 79 so the intent (and limits to) the regulation are clear.

If the replanting controls were expanded to be like those for afforestation, this would provide consistency in the policy intents and clarity in the land-use obligations. Undertaking this expansion would possibly require a change to existing use rights. This change may increase control, which would decrease the cost of preventative measures over time.

Notification periods are too short for forest preparation

For afforestation to proceed as a permitted activity, regulation 10 requires foresters to provide regional and territorial councils with written notice of where it will occur, between 20 and 60 days from the date when afforestation is planned to begin. Where a calculator score is required, this must be provided at the same time as notice, though it can be carried out any time within six months of notice being given.

Although foresters can plan their afforestation and order seedlings accordingly at any time before this, any dispute over the calculator score will occur at a point after most investment decisions have been made. This may be difficult for smaller landowners with little experience of forestry and/or wilding risk. It also puts councils in the difficult position of needing to question a score and potentially require resource consent for a planting programme – and associated economic activity required that is ready to begin.

Process for challenging a score is not straightforward

Where a person thinks they have fulfilled the conditions for a permitted activity, and in the case of wilding control they have submitted a calculator score of less than 12 to the council, the legal process for the council to query the score is limited. A council officer could question the score informally, but if the score remains contentious, the only legal option is to serve an abatement notice. This is a relatively significant compliance exercise, and it introduces potential uncertainly, delay, and cost for both parties.

[14] An area of indigenous vegetation or habitat of indigenous fauna that is identified as significant, in a regional policy statement or in a regional or district plan. An SNA is identified in the policy statement or plan, including a map, a schedule, or a description of the area by using significance criteria.

Site-specific assessment could be aided by reference to known high-risk areas

At present, someone seeking to afforest must carry out an assessment using the calculator, which includes two assessment criteria for downwind land use (grazing and vegetation cover). The Guidelines[15] require that the assessments consider these criteria within 2 kilometres of the afforestation site, though in some cases this may not be enough, depending on wind strength, and potential changes in land use.

The criteria for downwind vegetation are descriptive of cover type, but do not include a requirement to consider the value of that cover, such as high conservation value. New Zealand has a Geographic Information System (GIS) dataset showing areas of current wilding conifers, and this could be aligned with areas of high conservation value to provide more information about downwind risk. There is potential for a geospatial layer (an interactive geographic information system) of this nature to be used by councils in assessing resource consents or, if sufficiently robust, incorporated into a future version of the calculator.

Matters outside the scope of the NES-PF

Greater alignment between the NES-PF, councils, the forestry and farming sectors, and the National Wilding Conifer Control Programme would help to ensure that the limits of regulation do not leave gaps in control and prevention efforts, while maintaining the beneficial aspects of forestry.

New entrants to the forestry sector may have less understanding of wilding risk than more established parts of the forestry sector. This may mean there is more call for both private and council wilding assessments. It is not known what effect this is having in the private sector, but it is increasing pressure on council staff to process consents and provide opinions on the suitability of planting proposals.

The NES-PF sets rules for plantation forest for harvest and applies controls for eight core forest activities.[16] It was not designed to cover forests that are intended to be planted solely for permanent carbon sinks. Plantation forests established for harvest have a different set of environmental effects compared to permanent forests, and councils retain the ability to make rules in relation to afforestation in these areas. However, we are not aware of any councils that have rules for managing the adverse effects of wildings from permanent forests. We do acknowledge that there is a level of confusion about the regulatory controls of permanent carbon forests, and clarification over the scope of the NES-PF in this regard would be helpful.

[15] The guidance produced by Scion: https://www.mpi.govt.nz/dmsdocument/19124-guidelines-for-the-use-of-the-decision-support-system-calculating-wilding-spread-risk-from-new-plantings

[16] The eight core plantation forestry activities covered are: afforestation (planting new forest); pruning and thinning to waste (selective felling of trees where the felled trees remain on site); earthworks; river crossings; forestry quarrying (extraction of rock, sand, or gravel within a plantation forest or for operation of a forest on adjacent land); harvesting; mechanical land preparation; and replanting.


JOHN DEERE

5. Slash Management

5.1. WHY IS SLASH MANAGEMENT AN ISSUE?

'Slash' is defined in the NES-PF as 'any tree waste left behind after plantation forestry activities'. The term 'harvest residues' is also used to describe this material.

5.1.1. Slash generation

Slash is generated during mechanical land preparation, pruning and thinning, road building, and harvest. However, the bulk of material is generated at harvest.

Left on site, slash is useful for returning nutrients to the ground and providing cover from surface erosion and, up to a point, it provides important habitat in waterways. However, it can create problems where there is too much slash, or it is left in the wrong place.

5.1.2. Intense storm events drive slash mobilisation, and more intense events are expected

Slash on stable ground presents little risk. However, on steeper slopes, particularly where land is highly prone to erosion, it can mobilise and create significant problems. When slash mobilises in heavy rainfall events, it can become entrained in flood waters, causing or exacerbating slope failures, and contributing to debris flows.[17] These can cause significant damage to waterways; downstream infrastructure such as roads and bridges; and land, beaches, and estuaries.

Landslides and debris flow during high rainfall events are not uncommon in New Zealand, in plantation and native forests, and on land under pasture. Damage from these events is exacerbated where forest slash becomes entrained in the flow. For example, within weeks of the NES-PF coming into force on 1 May 2018, there was a significant localised rainfall event in the Tairāwhiti/Gisborne district, which caused several landing and slope failures and mobilised a significant quantity of forestry slash in the Uawa and Pakarae catchments. This caused damage to waterways, bridges and land downstream, and ended up on the beach at Tolaga Bay. NIWA has described the event as a 5.7% annual exceedance probability (AEP) event. This means there is an 18% chance that a flood of that size could happen every year.[18]

Climate change models predict an increasing frequency of high-intensity rainfall events for some parts of New Zealand,[19] including regions that have a high proportion of erosion-prone land. Forests provide important cover for erosion-prone land, both intercepting rain and stabilising erodible soils through their root systems. However, land managed for plantation forestry is more vulnerable to high rainfall events in the period when it is exposed following harvest; the previous crop's roots have broken down; and a new tree canopy has not yet established. This is called the 'window of vulnerability' and lasts between 3 and 8 years from the time of harvest, depending on the species and the inherent erodibility of the site. Managing slash to reduce the risk of mobilisation over this period is an important part of forestry planning and management.

5.1.3. Failure of landing sites where slash is piled

Slash is often left in piles (known as 'birds' nests') on the landing[20] where logs have been processed. Where the pile is located on stable ground, it can safely decompose over time.[21] However, the weight

[17] A debris flow is a very rapid surging flow of saturated debris in a steep channel. They have very high sediment concentrations by weight and are much more powerful and destructive than water alone. They may or may not contain woody material from forests. 'Debris Flows: New Zealand planted forests environmental facts', Scion https://www.nzfoa.org.nz/resources/file-libraries-resources/environment/factsheets/582-debris/file retrieved 6 July 2020.

[18] https://www.gdc.govt.nz/hydrology-data-from-june-floods retrieved 25 June 2020.

[19] https://niwa.co.nz/our-science/climate/information-and-resources/clivar/scenarios#regional retrieved June 2020.

[20] A landing or skid site means an area of land where logs or tree lengths extracted from a plantation forest are accumulated, processed, and loaded for removal.

[21] Piles of slash are a fire risk, but fire risk is not covered in the NES-PF. Forest companies manage this risk under other legislation and processes.

of slash piles on landings that have unstable soils, particularly under high cumulative or episodic rainfall, can cause slope failure and mobilise slash.

Designing earthworks and landings to minimise risk of failure is necessary to manage the risk of slash generation and mobilisation, particularly on terrain at higher risk of erosion. For this reason, management of slash, and minimising the risk of damaging slash events, must be considered alongside planning of earthworks control and management.

5.1.4. Waterways affected by slash

Slash in waterways can block fish passage, sediment, and water flow. Wood from broken limbs and fallen trees accumulating in waterways is a beneficial process in forests but becomes a problem when too much material builds up. Clear-fell harvest of a forest can result in a volume of slash far exceeding what is normally seen in a natural system. Accumulated slash in waterways can blow-out under heavy rain; this can scour out the waterway, harming fish, invertebrate, and vegetation communities.

5.2. SLASH MANAGEMENT SUMMARY

- Overall activity status and regulations are largely appropriate for a national-level regulation addressing on-site harvest residue management. Harvest on LUC 8e land is a restricted discretionary activity, which means most red-zone land requires resource consent for harvest. Measures to contain and remove slash are a matter of discretion that councils can apply to that consent.

- Safe and effective slash management is one component of good harvest management practice and should not be addressed in isolation.

- Geomorphologists agree that where a weather event is severe enough, or part of a sustained weather pattern, no form of land cover will prevent slope failure. In relation to plantation forestry, even the best forestry management practices will not prevent slope failure and landslides, and these can entrain slash. However, good practice can significantly reduce risk. Regulations on their own can't solve the issue of slope failure on highly erosion-prone land, which will remain a risk no matter what land-use practices are put in place. They can only make a limited contribution to good slash management as part of a wider forestry management system.

- Some changes to the regulations could be made to increase clarity of obligations, provide greater direction to foresters and councils, and align with policy intent.

- Real improvement will require consistent understanding and application of site-specific best practice from foresters. This needs to be supported by sound understanding of risk factors, and consistent and proportionate enforcement from council officers. Practice in this regard is inconsistent across the country.

- In the most extreme cases, the best option will be to retire some land from production forestry, and some forestry companies are doing this on the highest-risk land. This has significant cost and practical implications, including the need to ensure such land is replanted in some form of forest cover. How this is accomplished must be worked through over the longer term.

5.3. SLASH MANAGEMENT CONTROLS IN THE NES-PF

The intent of the NES-PF is to ensure slash is managed in such a way that it does not enter waterways where it can mobilise and cause downstream damage or block fish passage, or cause erosion and slope failure on landings or cutover. This is achieved through the requirement for ongoing monitoring until the risk from slash is significantly reduced.[22]

[22] Schedule 3(6) sets out the requirement to include management practices for maintenance and monitoring, including post-harvest monitoring of residual risks and the corrective action processes.

The NES-PF provisions for slash management were developed with input from council land managers, industry, and geomorphologists, and take a risk-management approach based on known risk factors. There is a considerable body of academic literature on slope stability, debris flows, and the role of different factors in their cause, including plantation forestry operations. Council and academic reports on past debris flow events provide some important lessons on cause and effect as they relate to forestry practices, though they also point to the limits of practice in preventing or causing debris flows.

Key provisions in the NES-PF:[23]

- Regulation 20 sets requirements for managing slash during pruning and thinning operations. At this time there is a standing crop of trees so the potential for slash to mobilise is minor, but the regulations require that slash is not deposited into waterbodies, onto land that would be covered in water during a 5% AEP, or into coastal water.

- Regulations 30-33 set permitted activity conditions for earthworks that are required to ensure that landings and roads are stable. Activities are permitted in green and yellow zones, and in orange zones where the slope is less than 25 degrees. In orange zones with steeper slopes and red zones, earthwork activities are permitted with height and volume restrictions. Resource consents are required in orange and red zones for earthworks exceeding these restrictions, and most first-rotation harvests in these zones will require consent for earthworks. The most important principle in managing risk in earthworks is water management, to ensure it is rapidly diverted away from earthworks. The regulations relate to management of fill and spoil; sediment and stormwater control; stabilisation; and roads, tracks, and landings. A forestry earthworks management plan is required for all earthworks that involve more than 500m^2 of soil disturbance in any 3-month period.

- Regulation 69 covers permitted activity conditions for managing slash and debris at harvest. It covers where slash must and must not be placed, and the downstream effects that must be avoided if slash enters waterbodies.

- Regulation 70 specifies that harvest is a controlled (consent required) activity in green, yellow, and orange zones, and red zones that are not LUC class 8e,[24] if slash management conditions, *inter alia*, cannot be met under regulation 69.

- Regulation 71 specifies that harvest is a restricted discretionary activity in red-zone land that is LUC class 8e.

- Schedule 3(5)(c) sets the requirement for harvest management plans to include the management practices that will be used to avoid, remedy, or mitigate risks due to forest harvesting on features identified and mapped under clause 3(3), including a range of slash management procedures.

5.4. REVIEW PROCESS FOR SLASH

There is no national-level data on the efficacy of particular slash management practices. It is also difficult to compare practices and outcomes across different districts and regions given the highly variable land types and land uses in New Zealand.

The current regulations have been tested by forestry and council representatives, with review by a consulting forestry engineer. This advice has been incorporated into the review.

The review used the information from the Tolaga Bay storm event that was publicly available (while prosecutions work through the courts), and past reports.

Three elements were considered:

[23] See regulations for full wording and detail.

[24] LUC class 8e refers to land for which the dominant limitation is erosion, so this covers the most erodible land in New Zealand.

- Whether the operative NES-PF appropriately provides for the environmental risks associated with slash to be avoided, remedied, or mitigated;

- Whether the guidance material published by the NZFOA[25] and Te Uru Rākau[26] appropriately supports the effective application of the regulation by councils, foresters, and silviculture and harvest operators; and

- Whether the regulations are being adhered to by operators, and council officers are applying a suitable risk management framework to slash risk and following this up as appropriate.

5.5. ISSUES IDENTIFIED IN THE REVIEW

The slash management requirements set out in the NES-PF are generally appropriate in directing operators to assess, plan for, and manage the environmental risk from slash. In particular, the provisions of *Subpart 6 – Harvesting* and *Schedule 3 Forest Earthworks Management Plan and Harvest Plan* provide specific direction to the factors that should be considered.

However, the regulations could be amended to improve clarity and clearly direct effort to the most important areas of risk.

5.5.1. Issues to do with clarity

Slash management regulations are set out in regulation 69 and in Schedule 3(5). Regulation 69 has minor clarity issues, but some of these have caused disputes in the field.

- 69(1) implies that all slash must be placed on stable ground, which is beyond the intent of the provision. This provision was intended to require that processing slash[27] be placed on stable ground to ensure that it does not become a hazard by contributing to or causing slope failure. As drafted, this exposes harvesters to legal risk if they leave any slash on 'unstable' ground in any ESC zone. The term 'stable' is ambiguous, and the science on slope stability shows that under the 'right' circumstances any ground can fail. Clarifying this wording will remove an impossible regulatory situation.

- The term 'processing slash' is ambiguous. It focuses on a known forestry process, but the intention of the regulations is to address risk factors, and in this case the risk is of unsafe storage of weighty slash.

- 69(2) requires 'slash from harvesting that is on the edge of landing sites to be managed to avoid the collapse of slash piles'. It is not clear whether this refers to slash on the landing, or slash below the landing. All slash should be managed to avoid the collapse of slash piles, so this seems to make a distinction that may be misleading. Wording should be unambiguous, to ensure both operators and compliance officers understand where action is required to manage risk.

- Schedule 3(5) sets out requirements for management plans, including requirements for managing slash. 5(c) is drafted in such a way that it mixes requirements for protecting identified sites (such as SNAs), which may be subject to several risks, with management of slash in general. If a narrow interpretation is taken, it may be to the detriment of broader slash management requirements.

There is no specific reference to slash management in regulation 66, which sets out the requirement to produce a harvest plan. Including reference to slash management provisions would emphasise the

[25] New Zealand Forest Owners Association, Forest Practice Guides: https://docs.nzfoa.org.nz/forest-practice-guides/

[26] Te Uru Rākau NES-PF guidance: https://www.teururakau.govt.nz/growing-and-harvesting/forestry/national-environmental-standards-for-plantation-forestry/nes-pf-guidance/

[27] Processing slash is waste material that is discarded after the log is processed at a landing/skid site. It includes slash in a range of sizes and is often discarded over the side of the skid site.

importance of slash management requirements in the harvest plan and reduce potential for misunderstanding.

5.5.2. Issues to do with information and experience

How do operators assess where a 5% AEP storm will reach?

Regulations 20 and 69 set out requirements to 'not deposit' or move slash that would be covered by water during a 5% AEP[28] event. The intent is that slash is not left where it could mobilise in a rainfall event with a 1 in 20 annual probability of occurring.

These requirements are well understood by foresters and enforcement officers with hydrological training and/or extensive practical experience, or where modelling is available that is widely agreed and understood. Applying this to a specific site requires a high degree of judgement but where this hydrological experience or skill is limited this may not be straightforward. These skills are not common or easily acquired.

Harvest plan requirements for slash management

The harvest plan regulations (Schedule 3(5)) set achievement standards for slash management, but do not set out:

- The risk assessment information/techniques that have been applied; and
- What management actions (including ongoing maintenance) have been selected as appropriate as a result.

A responsive risk-based regulatory structure is vital because site-specific assessment and practices are critical to good outcomes, and the harvest plan was developed as a mechanism for encouraging and documenting this. However, more direction could be included to require foresters to show how they have assessed slash risk and why they have chosen particular management actions.

Information requirements should be proportionate to the activity. They should ensure there is a clear link between risk identification and assessment, so that required actions are clear to both operators and compliance officers.

Safety issues

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

Removing slash from waterways, particularly in very steep land, can be a hazardous undertaking. The use of setbacks can help to reduce the likelihood of slash getting into streams, but at present there are many waterways that do not have setbacks. There is also a need to balance the benefits of removing slash with the environmental and safety costs of putting foresters and machines into waterways.

'Unsafe' is a subjective term, and operators are continually required to make judgement calls on site, and sometimes under pressing conditions. Because worker safety is a crucial factor in decision-making, clarity is essential to reduce risks to worker safety. The forestry sector has put a considerable emphasis on worker safety in recent years, and it is important to acknowledge that in some instances environmental outcomes will be compromised by health and safety 'bottom lines'.

Worker safety is controlled under the Health and Safety at Work Act 2015, and foresters have planning, documentation, and compliance requirements in relation to this Act, which should not be duplicated in the regulations. Clarity in the regulations is important to enable foresters to give effect to these requirements. However, the need to use on-site judgement daily means this issue will not be

[28] Annual Exceedance Probability refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage.

addressed through changes to the regulations. This requires conversations over time with compliance officers and mutual understanding of risk and trade-offs between safety and environmental controls. Guidance developed in conjunction with the Forestry Industry Safety Council (FISC) could be a useful impetus for those conversations.

Slash removal logistics issues

Volumes of slash are likely to be greater on steeper slopes and areas that are difficult to access because felling options are more limited than those on easier land. The felling options available on steeper land can result in greater stem breakage and therefore greater waste.

Slash is also more likely to be left on the land where there is no market for wood residue, and this usually coincides with increased distance to market and more difficult terrain. Removing or securing a higher proportion of forest residues/slash in these circumstances is a cost that could make some operations uneconomic, so any potential changes in regulatory requirements need to carefully balance costs with downstream risk. However, given the potential losses to downstream human and ecological communities in some parts of the country, a precautionary approach is required to ensure slash in high-risk areas is secured on site, or removed where it cannot be secured.

New Zealand does not have well-developed risk assessment tools or risk modelling for slope failure and debris flows that can be applied to forestry management to determine where efforts should be concentrated. The NES-PF has addressed the key risk of erosion through the ESC, but this only provides a high-level assessment at a scale of 1:50,000 and site-specific assessment is essential. Although the regulations require site-specific mapping down to a scale of 1:10,000, site-specific risk assessment information is not readily available.[29] Proposals to the Endeavour Fund in 2019 and 2020 to fill gaps in the science and provide risk modelling and assessment tools were unsuccessful, though there is potential to develop these if they can be funded.

While reducing slash may be desirable, where it is unsafe it should not be done at the expense of worker safety. Given that standing forests are on some highly erosion-prone land (and the significant erosion control they provide), site-specific assessment is essential to good decisions in this regard. A transition path to improved risk assessment, management practice, and replanting, or else retirement, is required. However, it will take a long time to reduce overall risk.

Following the Tolaga Bay storms in 2018, the Forest Owners Association and Forest Growers Research developed a work plan for addressing slash management on erosion-prone land. This plan includes a range of actions to reduce slash volume, which include alternative felling technologies and chipping harvest residues to reduce slash. The Eastland Wood Council in Gisborne has been working with forestry companies and Gisborne District Council to ensure best practice is followed, as well as improving communication with downstream communities and assessing where land should be retired. Many of these techniques will be transferable to other high-risk areas.

Earthworks and harvesting on highly erosion-prone land presents a special risk

The NES-PF was designed to acknowledge and plan for the greater risk of earthworks and harvesting on highly erosion-prone land. It is more difficult to design safe, effective controls for this land than for land which has lower erosion risk. As already noted, site-specific assessment is essential, and extensive experience with that kind of land is invaluable both for forest earthworks and harvest planners, and the councils that are responsible for issuing resource consents.

New Zealand has very experienced forestry engineers and harvest planners, but this is specialised work and forestry companies may compete with civil engineering companies for staff. In more remote parts of New Zealand, attracting and retaining such highly skilled staff can be difficult.

Better environmental, safety, and commercial outcomes could be achieved through greater discussion between industry experts, experienced council staff, and less-experienced staff over what good practice and risk management look like. We have seen some good examples of this working in some regions, but it is not happening across all regions. Some councils have compliance officers and land

[29] See Section 11.2 on the Erosion Susceptibility Classification for further information on scale issues.

managers with long experience working with the forestry industry in their regions, but we are aware of a generational shift in personnel as many of the most experienced staff move to retirement. The experience and judgement gained over successive harvest cycles and storm events takes many years to acquire. In some councils this loss of skills is being replaced with a high degree of caution and condition-heavy resource consents that may or may not be effective in reducing risk.

The skills and experience of forestry roading and harvesting contractors is another crucial element, yet these skills and experience vary enormously. It is important to recognise that a contractor with good skills and high practice standards in one region may not understand the impact of those same practices in a region with very different soils. Where contractors are working with experienced forestry engineers and harvest planners these differences can be accommodated, but on smaller-scale operations this may not occur.

Issues to do with slash traps

Slash traps are structures designed to intercept and trap slash in waterways before it can move further downstream. For plantation forests these structures are often small and simple, and may be set over a stream or river, in the bed of a river, or on land beside a river. Regulations 83-91 set the conditions under which constructing, installing, using, maintaining, or removing slash traps is a permitted activity.

The regulations set environmental performance requirements for slash traps but do not specify design requirements. However, the upper limit for a permitted activity within the bed of a river is a catchment of 20 hectares. This is a very small catchment and it precludes anything other than a small structure being constructed without resource consent.

This is an issue if councils take a highly risk-averse approach to slash trap design. It is becoming harder to get resource consent for slash traps in some regions. Some regional councils are directing companies to have engineering design and sign-off before approval. Councils do not want to approve something that then fails. However, this caution may result in expensive, over-engineered slash traps to cover uncertainties and the liabilities of engineering firms. If this in turn means simpler, effective structures are no longer being considered, other slash management practices will become more important.

For example, one company is moving away from use of slash traps in favour of extracting all wood without pulling through waterways at all. This significantly reduces the chance of slash getting into streams but requires them to build more landings and roads for access. This has the additional benefit of distributing residual slash across several landings in smaller, lighter piles, which are less likely to fail. However, it also means more earthworks are required, which increases the disturbance of land and its potential to erode. This represents a trade-off of different risks.

There is little information available on slash trap design. A recent paper provides an important advance in this discussion for New Zealand,[30] and the issues of size, design, and appropriate thresholds for a permitted activity should be revisited as more information is available. There is a need for more information where heavily engineered, permanent structures are not required or desirable, as risk of slash mobilisation decreases over time following harvest.

Slash traps will have site-specific design requirements, including surrounding environmental and safety conditions, and downstream land use and structures. Slash traps must also be carefully designed to minimise the consequences of failure. If a slash trap fails in a storm event, the release of stored energy and material can pose a risk to downstream infrastructure and communities. A national regulation cannot provide good regulation of design, which becomes increasingly technical as size and risk increase. More research is required to understand when slash traps are beneficial and where they increase risk.

It is not clear how slash trap regulations interact with land use. Although most of the conditions refer to in-stream effects, slash traps that are large enough to require land-based anchorage also need clear reference to land-use rules. For example, 85(1) does not allow a slash trap in a catchment bigger than

[30] Visser, R and Harvey, C, April 2020, *Design of Debris Slash Traps: Considerations for NZ Forestry Operating on Steep Terrain* Envirolink Contract 1968-GSDC158.

20 hectares to be within the bankfull channel width of a river, but if conditions in 84-91 are complied with, a slash trap on land is a permitted activity. Where a slash trap may fail and have a significant adverse effect on downstream communities, the regulations are silent.

5.5.3. Issues of enforcement and education

A sound slash management system includes suitable risk assessment and enforcement by councils. This requires that councils have consent staff, and compliance and enforcement staff, who understand where and how there is risk of slope failure, and the appropriate slash management practices that can be taken to manage that risk. They also need to understand where factors are outside the control of foresters, such as cyclonic storm events.

In some parts of New Zealand, councils have little experience of forestry practice, and/or high levels of staff turnover in compliance and enforcement. In others there are staff with many years' experience, which enables them to work productively with the forestry sector to identify risk and work cooperatively to find solutions and ensure these are implemented.

Similarly, some forestry operators do not have the required skills or capacity to assess and manage slash and slope failure risk, particularly where they have little experience in red and orange-zone lands. Practices that work well in one part of the country may be inappropriate in another part with a different lithology. Where expectations of compliance activity are low and/or pressure to harvest is high, poor practice has been observed.

Proactively upskilling both forestry and council sectors to understand risk factors and management options would provide greater certainty that good decisions will be made. This could be achieved in part by identifying regions where good practice is regularly achieved and sharing best practice, between and among councils and forestry companies. Although councils are in a regulatory position in relation to the NES-PF, they also have much wider functions in relation to land management in their regions. The NES-PF was developed with an expectation that planning, consenting, and compliance staff would work together, with industry, to improve forestry outcomes. We are seeing this in some regions, but the sharing of their experiences more widely would be helpful.

Advice on slash management is available through the Forest Practice Guides developed for the NES-PF, and the FOA is proposing further work. At present the information available describes some practice options and describes when they might be useful. However, they don't bridge the gap in experience that enables an inexperienced person to determine the level of risk and how that should be addressed. The FOA has recently updated its Forest Road Engineering Manual and produced a companion Operators' Manual.[31] This doesn't address slash but shows the type of detailed technical and practical information that can increase understanding of problems and potential solutions. A similar exercise for harvest management would provide an important source of education and information for both industry and councils.

As noted, New Zealand does not have good risk assessment tools that can be immediately applied to slash management as part of wider harvest management, but some companies have their own tools and checklists that they apply to site-specific assessment. Providing such a tool nationally could be helpful in focussing attention on the obvious risks and areas that are commonly neglected. In doing so, this runs the risk of becoming a tick-box exercise that shouldn't be a substitute for careful weighing of site-specific factors. Developing such a tool would need to be done within a wider education and enforcement strategy.

5.5.4. What can't regulations do?

Some slash risks are reasonably within a forest manager's control, but others are not. These include inherent land properties, such as underlying geology, soil, climate, slope steepness, shape, and other landform factors. Risks also include variables such as wind velocity or its direction, which creates windthrown timber that may mobilise in heavy rain events.[32] These create potentially large quantities

[31] New Zealand Forest Owners Association, *New Zealand Forest Road Engineering Manual*, *Operators' Guide 2020*: https://docs.nzfoa.org.nz/live/nz-forest-road-engineering-manual-operators-guide/

[32] Trees which are felled by wind and open up further potential for wind damage.

of non-merchantable decaying slash, that can't be harvested but can create a significant slash risk. Market conditions are also out of a forest manager's control yet have a significant impact on the amount of wood left in the cutover where markets don't exist for low-grade wood.

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

The following table (Table 2) has informed our review by identifying where slash risk exists, assessing whether that risk is addressed by the regulations, and whether it can be effectively addressed. Regulations need to be clear, unambiguous, and enforceable to manage site-specific activities and risk. In several cases additional methods are required to address effects and risk.

Table 2: Control methods for slash risk attributes

Slash risk attribute	Is it currently included in the NES-PF regulations?	Should it be included in the NES-PF regulations?	Can it be included in non-regulator methods, such as education, training, and advocacy?
Identify when too much slash is a risk.	No	Possibly, through application of risk-based tools	Yes
Quantify slash risk parameters, e.g. remove slash >10cm diameter, where in-stream volume is >Xm^3/10m stream length.	No	Possibly, but there is limited evidence to determine these parameters	Yes
Focus action where slash risks are more likely to be a problem.	Partially	Yes	Yes
Address cumulative operational slash risks, e.g. planning, operations, post-operations.	Partially	Yes, within the Schedules	Yes
Recognise time-based risks, e.g. short-, medium-, or long-term (5+ years).	No	Possibly, but more appropriate as a time-bound consent condition	Yes
Access additional information on operations where there is a perceived greater risk of a poor outcome irrespective of ESC, e.g. specific companies, forest size, or forest owners.	Partially, through consent mechanisms	Partially, as currently done	Yes
Address all operations that generate a slash risk.	Partially, as ignores minor slash generated by some operations	Keep partially as not worth the administrative effort for low-risk activities	Yes, e.g. additional material for earthworks and quarrying
Target practice that creates additional risk, e.g. slash in gully heads, on convex slopes above rivers, use of suitable harvest systems.	Partially	Possibly, but challenging to determine as site-specific	Yes
Acknowledge that slash is part of a natural forest system and that it cannot be entirely eliminated.	No	No (some slash is part of a natural forest system)	Yes

Slash risk attribute	Is it currently included in the NES-PF regulations?	Should it be included in the NES-PF regulations?	Can it be included in non-regulator methods, such as education, training, and advocacy?
Acknowledge and identify when potential health and safety risks must override slash management risks.	Partially	Yes	Yes, additional information
Identify that most in-stream slash control is not guaranteed, e.g. slash traps won't trap all slash or could fail under load.	No	No	Yes
Provide engineering solutions or designs to slash traps or other slash retention devices.	No	No	Possibly, but pressure increasing for these to be engineered structures as part of a resource consent process

6. Biodiversity

6.1. BIODIVERSITY IS DIFFICULT TO MANAGE THROUGH REGULATION

6.1.1. Plantation forests could be Significant Natural Areas

A Significant Natural Area (SNA) is an area of indigenous vegetation or habitat of indigenous fauna that is identified as significant, in a regional policy statement or in a regional or district plan. An SNA is identified in the policy statement or plan, including a map, a schedule, or a description of the area by using significance criteria.

Plantation forests, particularly long-rotation plantations or late periods within a harvest rotation, provide significant habitat, especially for mobile fauna. Plantation forests develop habitat characteristics over time, such as a closed canopy, vertical stratification and understory development, that are favourable to indigenous species. These in turn encourage fauna to inhabit the forest for part, or all, of their lifecycle. For example, this development of habitat leads to North Island brown kiwi being present in plantation forests across the upper North Island. Likewise, the plantation forestry rotation cycle can also provide opportunities for specific species. For example, kārearea are known to hunt in areas of cutover,[33] using adjacent unfelled trees for perching.

General land-use trends, the loss of other preferred habitat, and the individual characteristics of some species may also increase the chance that fauna will interact with humans in a plantation forest. For example, kea are well known for their curiosity and intelligence, and are attracted to human activity. In the Nelson Lakes area, kea are well known for investigating forestry skid sites in plantation forests. A project undertaken by the Kea Conservation Trust is currently under way to identify how they interact with plantation forests.[34]

These examples may mean that a forest could be treated as an SNA in its own right. In each of the above cases, indigenous species interact with a forestry activity, and the forest *might* be providing significant habitat value.

6.1.2. Identifying areas of significant indigenous biodiversity within the productive area of a plantation forest is a new approach for forestry

The presence of indigenous biodiversity in plantation forests is highly variable across and between forests. Many foresters make provision for protecting certain species or areas of habitat, either voluntarily or as conditions of resource consents. Approximately 1 million of the 1.7 million hectares of New Zealand's plantation forest is managed under Forest Stewardship Council certification. This sets requirements for managing indigenous biodiversity beyond the matters that are covered in the NES-PF. Several smaller farm foresters protect biodiversity values and biodiversity as a matter of personal conviction and responsibility.

To date councils have not designated the productive area of a forest as an SNA. SNAs within or adjacent to the productive area must be protected, but this has been done through place-specific controls. Where an SNA is mapped in forest management plans, it is clear to forestry personnel what must be protected and avoided. This becomes more complex where new protection practices are required within the productive forest.

The NES-PF does not manage terrestrial biodiversity[35] within a forest except by existing provisions protecting nesting birds and SNAs. The NES-PF was based on the concept that SNAs can generally be 'avoided' while undertaking forestry operations. It did not anticipate that the entire productive area of the forest would require protection as a result of developing over time into an area of significant indigenous biodiversity.

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[33] Cutover is the term for the land following harvest until the replanted forest has been established.

[34] Kea Conservation Trust, 'Supporting Forestry Kea': https://www.keaconservation.co.nz/projects/supporting-forestry-kea/

[35] Terrestrial biodiversity refers to organisms (plants, animals, and microbes) that live on land, as opposed to aquatic environments.

6.1.3. Conflict between productive use of land and managing the values of areas of significant indigenous biodiversity

Plantation forests are planted for productive purposes. This requires that the forest is harvested, most commonly through clear-felling that destroys habitat. The effects on biodiversity are variable and depend on the nature and speed of felling, refugia (biodiversity supporting habitat) that remain, and the surrounding land uses.

The forestry representatives we spoke to accept the need to protect biodiversity. They also expressed concern about what that entails in terms of costs, restrictions, and disincentives to establishing production forests. Providing protection for biodiversity presents costs for foresters, including:

- Lost use of productive land;
- Restrictions on activities at certain times of the year;
- Increased infrastructure and operating costs; and
- Forestry activities that are not commercially optimal in the way they are required to be managed.

Clarity is needed for the degree of responsibility plantation foresters should have for protecting the indigenous biodiversity that has been fostered through their establishment of a plantation forest, and how that fits into the wider community's responsibility for assisting protection efforts that have wider community benefits.

6.1.4. The proposed National Policy Statement for Indigenous Biodiversity has implications for plantation forests

The government has consulted on a proposed National Policy Statement for Indigenous Biodiversity (NPS-IB), which includes a proposal for criteria for identifying SNAs. These criteria include 'the habitat of rare and endangered species', which would mean that many plantation forests would be identified as SNAs. For example, any forest where kiwi are known to be present would become an SNA, which would potentially include most North Island forests. However, instead of this approach, the proposed NPS-IB proposes that where there are threatened and at-risk flora or fauna in plantation forests, these be known as 'plantation forest biodiversity areas'[36] not SNAs, with a flexible effects management regime for those species.

Submissions from consultation are still being summarised, so no decisions have been made about final policy or how this process might operate.

Under the NES-PF there is the potential for a number of activities which are currently permitted to require a resource consent, though the NPS-IB has been written with the intention that non-regulatory as well as regulatory tools be used. New Zealand has 1.7 million hectares of plantation forest and there would be additional financial and administrative burden where these species are found if current management practices could not meet any new requirements (for example, through current industry standards).

Achieving the policy intent of the NES-PF requires that adverse effects are managed while allowing harvesting to occur. Improving indigenous biodiversity outcomes to help enable the proposed NPS-IB will require clear understanding of where changes to practice are required to protect indigenous biodiversity, and where the risk of harm to indigenous biodiversity is low.

[36] Plantation forest biodiversity areas are deliberately established plantation forests which have been identified as containing significant indigenous vegetation and significant habitat of indigenous fauna using Appendix 1 *proposed National Policy Statement for Indigenous Biodiversity*.

6.2. KEY FINDINGS

6.2.1. There is no clear policy about what biodiversity outcome is expected from a plantation forest

During the review process, it was clear there was no common understanding of what a plantation forest was expected to deliver in the way of biodiversity outcomes, or the policy settings that would underpin additional regulation for biodiversity. Two general approaches have been discussed, but without reaching conclusions about which approach should inform policy. The first considers how a plantation forest can ensure activities are carried out in such a way that threatened species are protected. The second considers all the ways in which a plantation forest can enhance biodiversity.

Forest environments in general help a range of species survive, and some foresters seek to enhance biodiversity in their forests. It is not currently clear how this could be achieved through regulation. It is also not clear where the balance should be struck between requiring protection of species already in the forest and enhancing the forest habitat for those species.

6.2.2. It is difficult to obtain optimal commercial viability for a plantation forest that is also a habitat for indigenous fauna

Biodiversity protection is not easily simplified into the RMA effects management process, as plantation forestry potentially has both positive and negative effects on indigenous fauna. The scale of effect varies depending on what biodiversity value is being managed. Effects also vary through time, space, and context. For example:

1. Plantation forests may provide significant opportunities for indigenous biodiversity over previous land uses. For example, the conversion of an unproductive hill-country farm, or other areas that are too steep or hard to plant, into a forest results in areas being set aside in riparian setbacks. These non-productive areas may regenerate into native forest refugia, which over time can become habitat for indigenous fauna.

2. Surrounding land-use changes over time can increase the significance of a forestry block for indigenous biodiversity. For example, the harvesting of a small block that is isolated within a primarily pastoral farming landscape results in the loss of one of the few local refugia for native bats. The lack of other local refugia means bats cannot re-colonise the block, as most other suitable local habitat has been lost to dairy conversions over the last 15 years.

3. The scale of plantation forest operations may allow for better indigenous species management practices. For example, a large forest can be sequentially harvested and replanted so it includes a diverse range of stand ages. This habitat suits a population of kārearea, and the scale of the forest means the operator can isolate nests and vulnerable birds during the nesting season.

Each of these examples has markedly different management issues. These are difficult to generalise in a national environmental standard and may require different approaches to meet the sustainable management objective of the RMA.

In the first example above, the addition of a forest in an otherwise low biodiversity environment results in positive biodiversity effects. Activity standards create an additional compliance burden that did not exist for the previous land use. This creates an increasing regulatory burden where the management expectation rises over time. As biodiversity increases, the requirements to protect it will grow and the forester's costs will increase.

The NES-PF does not create an increase in obligation to protect biodiversity where a forester has actively fostered an increase in biodiversity. For example, afforestation must not occur within 10 metres of an SNA. This creates a setback in which plantation trees must not be grown. Some activities within the setback space are restricted, but others are allowed. Although we heard differences of opinion over what activities should or shouldn't be allowed in the setback, there are two principles directing rules:

- The setback is not part of the SNA; and

- The setback provides a buffer area to protect the SNA, so activities must be undertaken in such a way that they do not damage the SNA.

If all activities were to be prohibited in a setback, the SNA could expand into the setback. This would eventually require a further setback to protect the new biodiversity values.

In the second example above, the issue is a potential cumulative effect. Over time, land-use change has reduced available habitat in the area, resulting in the plantation forest becoming the last refuge for the bats. Requiring protection of the forest benefits the landowners who have already changed land use, placing responsibility and costs solely on the forest owner.

In the third example above, the forester has clear management actions that must be taken to protect the kārearea – identify nests and protect these during the nesting season. These can be communicated to staff, plans for management documented, and affected areas clearly marked. While this requires additional effort and cost, it is achievable through practical, time-bound actions.

6.2.3. A cyclical forest regime conflicts with providing continuous habitat for species

Different fauna use plantation forestry in different ways, so mitigating adverse effects on them requires a variety of management approaches. In some cases, management for habitat values may be compatible with the plantation forestry cycle. In others, a standard plantation forestry cycle may result in cyclical periods of growth and decline in biodiversity values.

Managing any species in a forest requires an understanding of the species needs at a particular site, along with an understanding of the effect of forestry activities on the habitat. This may constitute a conflict with the productive forestry cycle. For example, in large forests, nesting birds can be cordoned off until the birds have fledged, allowing for other parts of the forest to be harvested. This is much harder where the forest is small and the harvest window is short. The forester is still required to protect the nesting birds, but it comes at a cost that may not have been anticipated.

Multiple significant fauna species may require management within a plantation forest. Managing the needs of multiple species at the same time may require different, and potentially conflicting, management interventions. There is no agreed way of weighing different biodiversity values in order to prioritise actions. In the extreme, the biodiversity values of a plantation forest may be so high that economically sustainable harvest is not possible. It is not clear what would happen in this case.

6.2.4. Foresters do not control all biodiversity actions

The rules for protecting indigenous biodiversity in the NES-PF are intended to be within the control of foresters as they carry out forestry activities. However, some factors that are significant to good biodiversity outcomes are not within the control of foresters. These include:

- *Surrounding land uses*: The nature of the surrounding land uses can help or hinder protection efforts by foresters. For example, nearby areas of native vegetation can provide refugia at harvest, additional food sources, and an increased genetic pool for biodiversity in a forest. Conversely, pasture farming next door provides none of these things when the forest is harvested. The practices a forester would need to put in place will vary accordingly.

- *Weed control and seed source*: Setting aside areas from production forestry to provide enduring biodiversity habitat is one way of providing refugia for species at harvest. However, there is no guarantee that these will develop into useful habitat without ongoing weed control and a source of native seed. This is particularly difficult on ex-farmland where seed sources may have been exhausted for some time.

- *Genetic diversity in remnant populations*: Protection measures will be in vain if a population is so small and separated by distance from other populations that it can't survive in the long term. In this case, translocations of members of the population may be the best ecological

outcome, but this requires expert assistance from experienced ecologists, such as Department of Conservation staff.

- *Agreed actions for protection*: New Zealand has well-agreed actions for protecting kiwi and kārearea in plantation forests, but information for other species is insufficient. It is difficult for foresters to know what actions they need to take where there is no general agreement on what is required.

6.2.5. RMA regulation puts responsibility for biodiversity on parties with limited control

The RMA requires that adverse effects of activities are avoided, remedied, or mitigated. Protecting and enhancing biodiversity requires a range of positive actions, often by different parties unrelated to the effect that they may mitigate. For example:

- *Pest control*: Foresters often carry out pest control in their forests as this is one of the most effective protections for indigenous species. They do not have control over efforts by their neighbours, including those on the public estate. Therefore, where neighbours are not controlling pests at the same rate as the forester, their forests can easily be re-colonised.

- *Accountability*: Some mobile species will use plantation forests as one part of a larger habitat. It is not clear how a forester can be held accountable for the survival of mobile species and how that accountability is shared with other landowners in a catchment.

- *Catchment effects:* Cooperation between landowners/across a catchment can result in better biodiversity outcomes. For example, different forest owners could coordinate their harvest efforts to ensure that enough habitat is always available for mobile species, maintaining a corridor between habitat patches. This is not easily achieved by setting rules for specific activities. A permitted activity cannot be subject to a third-party approval, and while requiring multi-party conditions in resource consents is possible, it is highly case-specific. It is not apparent how this would work through an NES.

- *Set-asides:* Forest Stewardship Council rules enable foresters to meet some biodiversity requirements by setting aside a portion of their land for protection while carrying on their usual activities in the rest of the forest. This concentrated effort generally has greater benefits for biodiversity than several smaller areas. This is not easy to achieve under the RMA, which requires that adverse effects are managed, as it would tacitly allow the biodiversity effects in some areas to be ignored.

6.2.6. There is insufficient data to develop national provisions that are efficient and effective

The lack of empirical data makes the development of informed policy options and the national implementation of effective provisions difficult.

- There is no evidence of prevalence of species in plantation forests. There have been limited studies in some forests: for example, there is general agreement that kiwi will be found in many North Island plantation forests, but this doesn't lead to conclusions about other species.

- There is a range of options for how to improve operating practices to protect some of these species, but the literature in New Zealand is not enough to make informed decisions and management interventions. For example, providing refugia for mobile species at harvest is an intuitively reasonable approach, but there is no evidence for how effective this is.

- There is a risk of not acting, but we are unable to determine how big this risk is as there is no cohesive view of the value of plantation forests as habitat.[37] Some literature suggests that for many indigenous species, plantation forests are less preferred habitats (or 'sink' habitats).

[37] Conversely, for other biodiversity issues there is significant evidence that suggests the risk of not acting is large, even if the value of particular interventions is not fully understood. For forestry, we don't even know the scale of the problem we may be trying to manage.

However, in some cases any habitat can be important for maintaining the viability of a population.

We also sought information on the way in which the current regulations are being implemented, including whether it would be possible to develop biodiversity monitoring indicators. That work has not progressed, because although monitoring a suite of biodiversity attributes is possible, it would need to be site-specific, and there is no suitable baseline data against which to measure progress. Individual forest companies have some data, particularly where they are reporting to Forestry Stewardship Council for certification, but this is site-specific and not applicable at a national level. However, lessons from this type of monitoring would be useful in future for considering the most important factors in good biodiversity outcomes over a forestry cycle.

The environmental planning and design consultancy firm Boffa Miskell asked regional councils whether they run a check over mapped SNAs when foresters submit activity notices. Of the eight regional councils they spoke to, most, though not all, run a check of the activity notices against their GIS databases containing spatial maps of SNAs. Council staff noted that foresters generally check their proposed activity sites against council online information prior to submitting the notification, so the forester generally identifies the requirement for authorisation themselves. Where SNA mapping hasn't occurred, or data isn't maintained, foresters may not know whether an area of vegetation is an SNA. Larger companies may have access to ecological advice, either through in-house ecologists or contractors, but this is less likely for smaller companies and farm foresters. Reliable SNA mapping has been identified as a key input to better management of indigenous biodiversity during the NPS-IB process.

6.2.7. Biodiversity provisions can raise equity issues for forestry landowners

In New Zealand, plantation forestry owners are in the unique situation of producing a commercial crop which has potential biodiversity benefits. Other productive land sectors, including pastoral and arable farming, are not expected to protect biodiversity that appears as a result of the productive land use. They are only required to manage the external effects of their activities.

The policy challenge is to define an acceptable level of management for biodiversity within forests, and where the balance lies between foresters paying to provide a public benefit and where the government is responsible for doing this on behalf of all New Zealanders. Other land-use sectors (once established) manage effects external to their crop.

6.2.8. The NES-PF does not set rules for vegetation clearance prior to afforestation

One of the causes of a reduction in indigenous biodiversity is land-use change where indigenous vegetation is converted to productive uses such as farming, forestry, and urbanisation. The NES-PF does not include rules for vegetation clearance prior to afforestation: district and city councils are responsible for these rules. Afforestation under the NES-PF may only occur if it is allowed under the district plan.

It has been suggested that the NES-PF should include vegetation clearance rules to ensure that afforestation does not occur on land that has, or may develop, high indigenous biodiversity values.

6.2.9. Some minor changes to existing biodiversity provisions are required for clarity

The review has focussed on fauna and habitat issues as they are areas of significant concern to stakeholders, particularly given the development of the NPS-IB. It is important to test the existing provisions. There are some ways in which they could be strengthened without waiting for further development of policy relating to biodiversity in plantation forests.

6.2.10. The systemic issues that justified the development and consultation of a national policy statement need to be addressed

The proposed NPS-IB identified that there is a need for a National Policy Statement to address some of the shortcomings of the current RMA regulatory system. These shortcomings include poor

identification of habitat, poor and variable protection between different local authorities, and the lack of a systematic approach to managing biodiversity within a landscape or region.

Each of these shortcomings applies to the management of biodiversity values within plantation forestry. Outcomes for biodiversity in a plantation forest will be sub-optimal unless these are addressed, as the forestry industry cannot address landscape-scale issues individually. Nor does the industry have the mandate, skills, and expertise to manage biodiversity without a strengthened role for local authorities and central government.

6.2.11. Without resolving these issues, modifying the NES-PF is of limited value as it is a set of rules, rather than a site-specific application of principles

The NES-PF provides rules, standards, and matters of discretion, so modifying it to address comprehensive management of biodiversity values is of limited value. Other than clear-cut cases that can be managed by performance standards or a management plan, the lack of direction on how to balance competing objectives is likely to result in conflict between foresters and regulators. This is because the core regulatory driver (on an individual or site-specific basis) is the management of adverse effects, rather than the balancing and prioritising of particular objectives.

If policy issues are resolved, the NES-PF can be used to address these issues. This can be done by either providing the methods to councils, or a structure and process that enables foresters to identify the relevant outcomes and the process to demonstrate compliance.

6.2.12. Increasing regulatory intervention to manage biodiversity in forests is theoretically possible, but comes with significant costs and high risks

The following increased regulation was considered to manage biodiversity in plantation forests:

- Require foresters to produce and implement management plans that manage habitat for specific species. We have not considered the detail of these plans, including the degree of direction and support a forest owner would have, and the role of the regulatory authority.

- Specific performance standards, as used in some jurisdictions overseas.

At a high level, these interventions could be valuable and are within the scope of regulatory and non-regulatory tools available to government. However, the limited amount of information to support any intervention makes it challenging to develop any of these potential interventions further. Risks include:

- Lack of effectiveness where we do not have enough information to design regulatory controls or provide a structure that gives enough guidance to foresters.

- Adverse outcomes and unintended consequences, as requiring greater biodiversity management may encourage lawful activities that reduce the chance that biodiversity will develop. This includes the risk that new afforestation will not occur because of its real or perceived biodiversity management costs.

- High costs, as interventions are potentially costly, with uncertain benefits on both a site-specific and national level.

Any regulatory programme must consider how these risks would be addressed, and how further information is included in a positive feedback loop that ensures the regulations are clear and fit for purpose.

6.2.13. Clarity and certainty can be improved

These enhancements include improvement to standards that manage SNAs, while alignment with the NPS-FM and NES-F will result in change that may further protect aquatic biodiversity. These improvements are limited, however, and will not address the core issues that inhibit effective management of biodiversity in plantation forests.

6.2.14. Voluntary initiatives are beneficial, but don't align well with RMA requirements or capture all owners

The Forest Stewardship Council and the Endorsement of Forest Certification programme currently certify a significant proportion of the plantation forest estate (1.2 million hectares). These programmes require areas to be set aside for biodiversity preservation and management. The uptake of these programmes represents a significant non-statutory opportunity to encourage biodiversity management. The significant areas of land that are managed for enhanced biodiversity value, and the foresters that manage and encourage these areas, should be recognised for their important contribution to biodiversity maintenance and enhancement.

There are limitations to these programmes. There is no guarantee that they capture biodiversity values within the productive part of the forest as they often encourage dedicated areas for biodiversity. They may not manage and enhance biodiversity values in a coherent way that meets the purpose of the RMA and the aspirations of New Zealanders. Certification schemes may not address mātauranga Māori and cultural values that are inherent in RMA biodiversity management. From an RMA regulatory perspective, there are legal and principle constraints on delegating compliance to a certification scheme.

Certification schemes also have a gap because they predominantly certify larger forests. Small forests, such as farm woodlots, sit in different landscapes and have different aggregate adverse effects to those of larger forests. Certification may not address biodiversity issues for small forests, and current requirements of these schemes may be unworkable and prohibitively expensive for smaller forests.

6.2.15. Setting vegetation clearance rules is a district and city council activity

The NES-PF does not set rules for vegetation clearance prior to afforestation. Control over this activity remains within district and city councils. The NES-PF sets plantation forestry activity rules within a certain scope. The NES-PF is agnostic about where afforestation occurs, except in relation to the erosion potential of land.

Setting national rules about vegetation clearance would be extremely difficult given the range of vegetation types and local considerations of biodiversity value. The biodiversity values in vegetation on a site will be compromised by clearance, not in general by the type of activity that occurs following clearance. As such, it would not be appropriate to set forestry-specific rules where all land uses are likely to have adverse impacts on biodiversity through vegetation clearance.

6.3. BIODIVERSITY SUMMARY

- The NES-PF is a regulatory instrument that must give effect to section 6 of the RMA. This requires protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. It is unclear where an equitable distinction can be drawn between the protection of what is there while carrying out a productive activity, and altering the activity, that is plantation forestry, to provide enduring habitat for biodiversity.

- Plantation forests provide habitat for a range of New Zealand's threatened or at-risk species and support a range of other indigenous and non-indigenous species. Good forestry management practices successfully allow for the appropriate management of indigenous biodiversity within plantation forests.

- The cost of this protection is borne by forest owners, with little support from central or local government. Most big forest companies in New Zealand carry out biodiversity protection under the requirements of the Forest Stewardship Council certification system, which has extensive requirements. Several smaller foresters proactively protect biodiversity, but fear that the cost of formalised requirements will undermine the incentive to afforest.

- The territory for biodiversity is broader than the plantation forest because species are mobile, as are the pest species that prey on them. Fauna such as kiwi, bats, and falcons are not static in

plantation forests, and their successful protection requires activities (including predator control) throughout the wider landscape and community.

- The NES-PF reflects the difficulties of codifying biodiversity protection in activity-specific regulations, especially where biodiversity outcomes are dependent on matters that can't be controlled within the forest. This remains a significant problem.

6.4. THE NES-PF PROTECTS BIODIVERSITY

6.4.1. The NES-PF must protect areas of significant indigenous vegetation and significant habitats of indigenous fauna

As an RMA instrument, the NES-PF must recognise and provide for matters of national importance set out in section 6, including the protection of areas of indigenous vegetation and habitats of indigenous fauna, defined as SNAs in the NES-PF. The NES-PF contains regulations which seek to give effect to this requirement, though they are limited in what they can achieve. Some people consider they are not strong enough or do not go far enough; others that further regulation is not the best way to encourage or increase better outcomes for biodiversity.

An RMA instrument is also required to balance a range of factors in achieving the sustainable management of natural and physical resources under section 5, including providing for social, economic, and cultural wellbeing.

The government has been developing and consulting on a proposed NPS-IB which seeks to arrest the decline of New Zealand's biodiversity by strengthening RMA processes. The NPS-IB development included discussion of policy for plantation forestry, because it is recognised as having significant potential as habitat for indigenous biodiversity.

6.4.2. SNAs are identified areas of indigenous biodiversity value

Areas that are significant for their indigenous biodiversity values are often mapped or identified through criteria in a district or regional plan, or regional statement. These SNAs are places that are protected for their biodiversity value by objectives, policies, and rules in a district plan. Areas may be identified as requiring protection because they are patches of remnant native vegetation or contain threatened or at-risk species. SNAs have been identified both within and adjacent to plantation forests. The NES-PF sets rules for how the SNAs must be protected through setbacks and restriction of forestry activities.

6.4.3. The NES-PF includes provisions that manage the impact of forestry activity on indigenous biodiversity

These include:

- Setbacks from SNAs;
- Requirements to provide fish passage and protect habitat of aquatic biodiversity (particularly through extensive controls for erosion and sediment control);
- Constraints on the clearance of indigenous vegetation within the plantation forest;
- Requirements to avoid and mitigate the effect of plantation forestry on certain nesting indigenous birds; and
- The ability for councils to put more stringent rules in place if the rule recognises and provides for the protection of SNAs.

The NES-PF does not set rules for vegetation clearance prior to afforestation, and control over this activity remains within the control of district and city councils.

6.5. REVIEW PROCESS

Much of the discussion of biodiversity in plantation forests was carried out with the Stakeholder Implementation Working Group (SIWG) and between Te Uru Rākau, the Ministry for the Environment, and the Department of Conservation. It was driven by the NPS-IB process and the advice provided by the Biodiversity Collaborative Group to the government.[38] There was agreement across all groups that whatever protection plantation forests should provide, the right to carry out plantation forestry activities, including harvest, should remain. What this means in practice has not been determined and remains an area of significant work both at a policy and a practical level.

The SIWG considered:

- An objective for improving the management of threatened and at-risk species in plantation forests, and a potential approach for incorporating this in the NES-PF; and
- A management plan to deal with threatened or at-risk species in the NES-PF. This would entail development of species management templates so foresters could produce site-specific species management plans.

The SIWG agreed that before changes to the NES-PF could be considered, more information was required on the presence of indigenous species in plantation forests, and the effects of forestry activities on those species. Better information would enable the government to identify where changes might be required, and what those changes might be. It would also indicate where broader system matters are required to improve biodiversity management in plantation forests that can't be achieved through regulation.

We commissioned an ecologist to provide information on:

- What threatened species are likely to be found in plantation forests;
- What processes exist for identifying threatened species;
- What actions are required to protect different species;
- What resources exist to assist foresters in managing threatened species; and
- What are best-practice forestry methods around significant areas of vegetation.

This work has provided a picture of what is known about indigenous flora and fauna, and how they are likely to interact with plantation forests. It makes suggestions for some of the ways in which changes to the regulations could improve outcomes for indigenous biodiversity overall. Better outcomes could be achieved with a policy framework that addresses practical considerations, and equity and cost issues.

The work provides a broader view of biodiversity protection in plantation forests. This has helped to identify issues in managing biodiversity. In many cases, a regulatory solution through the NES-PF will require a considerable change to the NES-PF.

6.6. CONTROL METHODS FOR BIODIVERSITY

The biodiversity work commissioned identified a wide range of options for protecting and enhancing biodiversity in plantation forests (Table 3). Some of these, such as riparian setbacks, relate to existing provisions in the NES-PF. Others are outside the scope or powers of the NES-PF. Most would need to be considered within the broader context of what New Zealand requires private landowners to do to protect indigenous biodiversity.

[38] Biodiversity Collaborative Group advice: http://www.biodiversitynz.org/uploads/1/0/7/9/107923093/final_online_-_biodiversity_group_report_1_oct_4pm.pdf

The advice provides a Western ecological overview of best practice at a landscape level. Further research is required to synthesise the findings with mātauranga and Te Mana o te Taiao.[39] These perspectives will need to be incorporated into national policy for public consultation.

Table 3: NES-PF biodiversity control methods

Biodiversity recommendations	Is it currently included in the NES-PF regulations?	Should it be included in the NES-PF regulations?	Can it be included in non-regulator methods, e.g. education, training, advocacy?
Provide clear guidance about the alignment and interaction of other national directions (e.g. draft NES-F and proposed NPS-IB) for foresters.	Partially through stringency regulation	Limited to direction on stringency	Yes
Review NES-PF regulations to require avoidance and/or stipulate the amount of riparian zone disturbance that is acceptable.	Yes	Yes	Yes
Develop threatened species management plans (where not already available) to provide general guidance.	No	No	Yes
Tailor species management plans to site-specific forest situations where threatened species are present and well documented.	Partially through nesting requirements	Yes	Yes
Identify and plan for the protection/ establishment of wildlife refuges and linkages between indigenous vegetation remnants.	No	No	Yes
Require replant planning to identify any harvest areas that damaged riparian vegetation and adjust replanting to avoid or further minimise such damage in the future rotation.	No	Partially	Yes
Consider leaving plantation trees unharvested where they can provide riparian protection value or wildlife habitat value.	No	Possibly	Yes
Undertake detailed operational scale erosion risk mapping as a prerequisite for roading, harvesting, and replanting operations within orange and red ESC zones.	Yes	Yes	Yes
Assess the options for establishing constructed wetlands below vulnerable erosion risk land to help absorb excessive sediment until land retirement/catchment clearance limits become effective.	No	No	Yes
With limited resources it is a priority to focus management on the most threatened species first before more common species are given attention.	Yes	Yes, subject to wider approach	Yes
Avoid damage to riparian buffers by hauling away from buffers and/or plan and use haul-through harvesting corridors to minimise (e.g. <10%) stream length damaged.	Yes	Yes	Yes
Require retirement of highly vulnerable erosion risk land (identified in detailed operational scale erosion risk mapping) from clear-fell forestry.	Not directly, though consent conditions could require this	Possibly	

[39] Section 8 of the RMA requires that in achieving the purpose of the RMA, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Biodiversity recommendations	Is it currently included in the NES-PF regulations?	Should it be included in the NES-PF regulations?	Can it be included in non-regulator methods, e.g. education, training, advocacy?
Avoid damage to indigenous remnants or, if unavoidable, minimise damage with well-planned haul-through harvesting corridors and plan replanting to avoid future damage.	Yes	Yes	Yes
Ensure best practice is followed by the industry for disease transmission, and pesticide and fertiliser use.	No (out of scope)	No	Yes

7. Implementation Issues

Te Uru Rākau considered implementation issues specified in the terms of reference:

- Whether councils had undertaken plan alignment appropriately;
- Whether and how councils are applying more stringent rules;
- Adoption of charges for monitoring permitted activities; and
- The efficacy of tools incorporated by reference.

The review of alignment, stringency, and charging is a snapshot based on the time it was undertaken. Most of the information comes from desktop plan reviews undertaken in 2019, so councils may have subsequently modified their plans to undertake alignment or introduce stringency since that time.

The desktop review involved sampling regional and district plans, discussing the issues with the SIWG, and individual communications with stakeholders about rules that may have been more stringent or out of scope. These individual contacts and SIWG discussions have informed our view or given examples of how stringency is applied in situations.

Sometimes the more stringent rules had been clearly identified, while in other cases it was less clear, and staff exercised judgement based on their understanding of the alignment and planning documents.

Information on monitoring charges has been derived from a survey of monitoring charges in regional councils from data in the 2018-19 annual planning cycle.

Boffa Miskell carried out an early review of implementation of the NES-PF, which included an assessment of monitoring activity. We have also heard directly from some forestry companies about how they are being charged, and from some councils on how they are charging.

8. Council Plan Alignment

8.1. SUMMARY

- When an instrument of national direction is introduced, councils must amend their plan(s) to remove any duplication or conflict with that instrument as soon as practicable, under section 44A of the RMA.

- The NES-PF allows councils to retain rules that are more stringent than the NES-PF in a limited number of circumstances.

- Most regional and unitary councils have undertaken, or are undertaking, alignment of the major parts of their plans which deal with forestry. Fewer district and city councils have undertaken this process, reflecting the more limited impact of the NES-PF on these plans and the capacity of these councils to undertake this work.

- Any changes to the NES-PF will require councils to review the regulatory changes and determine if they need to undertake further plan alignment. The degree of additional work will be significantly greater for councils if the scope of the NES-PF is changed or the matters for stringency are modified. This is a significant potential cost and administrative burden for councils.

8.2. THE RMA REQUIRES PLAN ALIGNMENT WITH THE NES-PF

Following the introduction of a national environmental standard, councils must amend their plan(s) to remove any duplication or conflict with that instrument, as soon as practicable after the standard comes into force. This council plan alignment is required by section 44A of the RMA and does not require a Schedule 1 plan change process.

In practical terms, this means that councils must consider their current plans and if any rule that 'duplicates or conflicts' with the NES-PF is found, they must amend their plan to remove any duplication or conflict. However, if the conflicting rule is 'more stringent', the NES-PF allows this rule to remain.

This process is referred to as 'plan alignment' because it requires councils to identify and resource/plan users to understand:

- Where the NES-PF applies; and

- Whether the council has any relevant but more stringent rules, or any rules that are outside the scope of the NES-PF but are relevant to some forestry activities.

Section 44A alignment is a technical process in relation to a council's existing plans, but good practice would see councils clearly communicate if, and where, the NES-PF does not apply in their region or district. Council plan alignment has a direct impact on how effectively people can comply with their obligations under the RMA. Alignment enables people to identify what rules apply to their activity, and what standards they must meet.

Plan alignment needs to be comprehensive, across all aspects of the councils' plans; otherwise it can result in confusion and unintended non-compliance. Alignment which is poorly undertaken, or which results in retaining a significant number of more stringent rules, reduces the NES-PF's ability to meet the objective of national consistency.

Plan alignment shows us what councils consider more stringent, to enable us to understand how the NES-PF is achieving its objectives of consistency and environmental outcomes.

8.3. KEY FINDINGS ON THE WAY COUNCILS HAVE UNDERTAKEN ALIGNMENT WITH THE NES-PF

8.3.1. Most regional councils have undertaken alignment

All regional and unitary councils have undertaken, or are in the process of undertaking, alignment of the major parts of their plans that deal with forestry.

Many regional councils have more than one relevant plan. Some councils have a separate regional plan addressing discharges to air, or coastal activities. Others have catchment-specific plans, or former regional plans that are still in effect while a new plan is being notified and heard.

Where a regional council has more than one plan, alignment may have only been undertaken for the 'primary' plan in effect in the region. This may cause uncertainty in some situations. For example, if alignment has not been undertaken for the regional air plan, and a forestry quarry is discharging dust, it may be unclear if the forest quarry operator needs to comply with the NES-PF dust standards, or any relevant regional air plan standards.

8.3.2. Most district and city councils have not undertaken alignment

Te Uru Rākau reviewed a sample of district plans to determine if district and city councils have undertaken alignment. Most district plans in the sample had not yet undergone alignment.

This lack of alignment has less direct impact on resource users, because most NES-PF rules are regional rules. We consider this largely reflects district and city councils' limited capacity and the low priority the NES-PF has given its limited number of district rules. However, this creates a risk that foresters follow the NES-PF, carry out an activity in an area with a more stringent rule, and the council either does not realise, or enforces a consent requirement or standard after the activity has taken place.

Poor alignment is likely to create issues for resource users where an activity affects a matter for which council can retain stringency: for example, where it is unclear whether the relevant significant natural area rules are in the NES-PF or the district plan.

8.3.3. Councils do not have discretion to address rules that duplicate or conflict with the NES-PF

A council has no discretion if it determines a rule 'duplicates or conflicts' with the NES-PF. This is because section 44A does not allow a council to choose whether to keep a rule that is more stringent than the standard, even where they may prefer to adopt the NES-PF provisions in relation to a matter.

This means plan alignment has resulted in some regional councils retaining many rules that are technically 'more stringent' in some situations. These more stringent rules may have limited environmental benefit or may not be determined except on a case-by-case basis (therefore limiting the benefit of consistency).

Once alignment is complete, a council must retain any rules that have not been deleted in its plan (or plans). If a council wishes to rationalise its rules, or make them easier to understand, or address inconsistencies, the council must use a Schedule 1 RMA planning process to modify its rules. This is a significant time commitment and cost for the council.

Some councils have used plan processes (either already under way or planned at the time of the NES-PF) to simplify several more stringent rules that were retained through plan alignment. Councils such as Marlborough, Canterbury Regional, Greater Wellington, and Northland have used plan reviews or plan changes to consolidate more stringent rules into one location in the plan, easing the comparison burden a user must undertake.

8.4. OPTIONS TO ADDRESS ISSUES WITH ALIGNMENT

The requirement to undertake alignment is contained in section 44A of the RMA. Options for amending the RMA for alignment are outside the scope of the NES-PF review.

There remain areas where councils could improve their alignment processes to provide more certainty for the forestry sector and their communities. Notably, this includes:

- Ensuring alignment is carried out for all regional plans other than the 'primary' plan in a region; and

- District and city council plan alignment.


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9. Stringency

9.1. SUMMARY SECTION

- Stringency enables councils to manage the requirements of different instruments of national direction under the RMA. In effect, the stringency provision of the NES-PF recognises that the performance standards of the NES-PF cannot provide for all national policy outcomes.

- More stringent rules allow additional control, but it is hard to link some cases where stringency is applied to an environmental benefit. Stringency is seen as a major cause of inconsistency and additional cost by resource users.

- Councils retain the ability to make rules for activities that are not plantation forestry as regulated by the NES-PF. Sometimes, rules for matters that are outside the scope of the NES-PF apply to forestry activities, for example rules relating to water yield or archaeological sites. The distinction between 'scope' and 'stringency' is not always clear.

- Many regional and unitary councils are applying more stringent rules. A significant number of more stringent rules pre-date the NES-PF and have been retained through the plan alignment process, as required by the RMA.

- Many stringent rules reflect different (local) ways of solving similar problems. Stringency is being used to reconcile competing national direction and RMA objectives. Many of the more stringent rules in regional plans enable councils to implement the NPS-FM, including ecosystem health attributes. While national direction drivers remain, stringency is a core component of the NES-PF.

- The stringency provisions are drafted to enable councils to comply with all RMA obligations, but this does reduce the ability of the NES-PF to provide a nationally consistent rule set.

- Differences between regions cannot be solely explained by more stringent rules. It is unclear to what extent variation between councils is being driven by stringency, differing approaches, or business rules.

- Guidance and implementation assistance are more likely to improve the quality and consistency of rules than regulation changes to remove or reduce stringency.

9.2. WHY IS STRINGENCY AN ISSUE?

9.2.1. Stringency is intended to enable councils to reconcile competing policy objectives, but the link to the intended objective is not made clear

Stringency enables councils to manage the requirements of different instruments of national direction under the RMA. In effect, the stringency provision of the NES-PF recognises that the performance standards of the NES-PF cannot provide for all national policy outcomes in the local circumstances.

Councils must make trade-offs whenever they implement national policy. For example, achieving the desired attribute state for deposited sediment in a Freshwater Management Unit (FMU) might require sediment reductions from several land uses. In this case, the council might introduce more stringent rules on forestry as part of a package addressing sediment issues in an FMU.

Sometimes it is unclear how a stringent rule achieves a national policy objective, because the rule is indirect and the link is not made explicit. Frequently, stringency allows a council additional control over an activity, but it is unclear how the council uses the additional control, and therefore how the more stringent rule relates to a particular outcome.

9.2.2. Stringency is seen as a major cause of inconsistency and additional cost by resource users

A core objective of the NES-PF is increasing consistency in the management of forestry activities across New Zealand. As stringency is the provision in the NES-PF that allows councils to create or retain bespoke rules, it is seen as a direct cause of additional cost and frustration for foresters, who would prefer to comply with the NES-PF standards.

Te Uru Rākau cannot direct how the stringency provision is to be interpreted. A broad interpretation can significantly widen the scope of what kinds of more stringent rules are adopted. This produces inconsistency in the application of the NES-PF, leading to a lack of certainty for resource users and inequity between regions.

9.3. KEY FINDINGS ON THE WAY COUNCILS USE STRINGENCY IN THE NES-PF

9.3.1. Regional councils are making use of their ability to have more stringent rules

Many regional and unitary councils are applying more stringent rules. These rules have generally been applied only to matters specified by regulation 6 of the NES-PF. However, some councils have taken a broad interpretation of regulation 6, resulting in a proliferation of more stringent rules.

A significant number of more stringent rules pre-date the NES-PF and have been retained through the plan alignment process. If a rule pre-dates the NES-PF and is more stringent, it must be retained when councils align their plans. Councils have no ability to modify rules to minimise conflict between the plan and the NES-PF without undertaking a time-consuming and expensive plan change process. More stringent rules are therefore retained, adding to the regulatory burden placed on resource users and undermining the ability to achieve national consistency.

9.3.2. Many stringent rules reflect different (local) ways of solving similar problems

Many of the more stringent rules in regional plans enable councils to implement the NPS-FM, including ecosystem health attributes. Many of these rules have clear links between the stringency applied and the environmental outcome or issue being managed.

Several more stringent rules will remain because a council plan uses different methods of managing an environmental issue addressed by the NES-PF. For example, a council may have decided to use the consent process for activities that pose a risk of sediment discharge and have limited permitted activity rules. Councils may not have previously used the NES-PF's erosion risk-based approach, so retain pre-existing rules that are more stringent.

Sometimes more stringent rules may not be obvious to the user because they are contained in general rather than forestry-specific provisions. For example, rules that manage stormwater may, in some cases, apply to forestry earthworks, and be more stringent.

9.3.3. Stringency is being used to reconcile competing national direction and RMA objectives

More stringent rules give a council the control it needs (in a resource consent process) to implement national direction instruments. We have found that the NPS-FM is the most common reason for more stringent rules.

Other more stringent rules give a council the means to achieve matters of national importance in section 6, including outstanding natural landscapes and significant natural features.

The ability to be more stringent enables councils to manage the interaction between forestry and other resource users and address environmental conflict or allocation. Therefore, some effects – notably cumulative effects on common resources – are not addressed by the NES-PF. Councils are currently required to manage these effects coherently across all land uses, at a catchment or landscape scale.

For example, catchment or FMU planning processes may introduce or strengthen standards for sediment. Even if the water quality within a forest meets community objectives within the National

Objectives Framework[40] (NOF), further reductions in sediment from a forest may be necessary to meet NOF standards downstream.

9.3.4. The scope of the NES-PF has been unclear to some users

We have found that some councils are unaware of how the scope of the NES-PF interacts with their plans. Councils have felt that they are unable to create a rule that affects plantation forestry, because it does not fall within the NES-PF allowance for stringency. In some cases, these questions have related to matters that are out of scope of the NES-PF, so the council does have the ability to introduce a rule to address the matter.

We are also aware of some rules that were either retained or proposed that are within the scope of the NES-PF but not enabled by the stringency allowance in regulation 6. A broad interpretation can significantly widen the scope of what kinds of more stringent rules are adopted. This undermines the ability of the NES-PF to provide a nationally consistent rule set.

9.3.5. Councils have wide scope to interpret the NES-PF – differences between regions cannot be solely explained by more stringent rules

An objective of the NES-PF is to increase consistency between councils. However, we have found that the requirements needed to comply with the NES-PF varies by council. Some areas require a high level of site-specific information collection and detailed design to allow an activity to proceed as a permitted activity.

Stringency enables councils to operate differently but is not the only reason for variation between councils. It is unclear to what extent variation between councils is being driven by stringency, differing approaches, or business rules.

Even if more stringent rules are not applied by councils, there may still be different outcomes or processes between regions. These differences can occur because of:

- Different council interpretations of the NES-PF;
- Different council business rules for managing the interaction between consent holders and the council; and
- Different ways of undertaking monitoring and compliance.

We have been unable to definitively determine what variation occurs because of a more stringent rule and what occurs because of different council practices. Given that different interpretations and practices account for at least some of the variation, these practice issues should be considered for any implementation programme, or any change to the stringency provisions of the NES-PF.

Further work is required to identify how the stringency provision has been interpreted, the impact this is having on nationally consistent outcomes, and providing guidance on its use.

9.3.6. Guidance and implementation assistance are more likely to improve the quality and consistency of rules than regulation changes to remove or reduce stringency

The forestry sector has told us that stringency is a significant issue for the industry and reduces the value of the national consistency the NES-PF is intended to provide. The consistency issue is harder to address where there are many more stringent rules, in regions such as Gisborne and Southland.

In these cases, the regional plans pre-date the NES-PF, so more stringent rules were retained through plan alignment. Some of these rules link to clear environmental requirements (such as requiring butt

[40] The freshwater objectives set by the Ministry for the Environment to meet community and tāngata whenua values, which include the compulsory values of ecosystem health and human health for recreation. See https://www.mfe.govt.nz/fresh-water/national-policy-statement/about-nps.

suspension when hauling across a river). Others are more stringent only on a case-by-case basis, because of a different way of addressing a problem (for example, a measurement standard).

Different methods, when the environmental benefits are limited or difficult to identify, undermine national consistency. For cases where the more stringent rule requires a consent, we have been unable to determine the effect of the rule in practice, as the rule results in different outcomes per consent. Further work to improve consistency is likely to be highly technical, as it requires methods to be aligned between councils.

Te Uru Rākau cannot set policy about how more stringent rules should be used, their structure, or their content. It also cannot direct how the stringency provision is to be interpreted. Guidance and implementation assistance are more likely to improve the quality and consistency of rules than regulation changes to remove or reduce stringency. Support should include better integration across instruments of national direction.

9.4. THE NES-PF ALLOWS COUNCILS TO HAVE MORE STRINGENT RULES

The NES-PF allows councils to have 'more stringent'[41] rules to achieve some environmental objectives, and to provide for some matters of national importance.

9.4.1. Stringency enables councils to apply their own rules to forestry activities

A more stringent rule is one[42] that is in a district or regional plan, and allows a council to:

- Impose an additional performance standard on an activity that is permitted in the NES-PF;
- Require a resource consent for an activity that the NES-PF permits; or
- Expand the matters the council may consider when processing a resource consent, and therefore potentially add additional conditions on a resource consent.

Regulation 6 of the NES-PF sets out the matters over which councils may retain or make more stringent rules. A more stringent rule may only be used to:

- Achieve an objective in the NPS-FM or some policies of the NZ-CPS, in areas where the NES-PF standards are not stringent enough;
- Provide for the protection of some matters of national importance, including areas identified as outstanding natural landscapes and significant natural areas; or
- Protect some specific environments, for example separation point granites or karst landscapes.

Councils are responsible for determining if a rule meets the criteria to be more stringent in the NES-PF. If a council wants to introduce a new more stringent rule, it must do so through a standard planning process, supported by a section 32 analysis.

Councils have wide discretion within the NES-PF to apply different business practices and expectations for resource users. These practices and expectations may have a greater impact on the environmental outcome than 'more stringent' rules.

[41] Authorised by section 43B(1) of the RMA.
[42] Section 43B(2).

9.4.2. Councils maintain control over matters that are out of scope of the NES-PF

Councils retain the ability to make rules for activities that are not plantation forestry as regulated by the NES-PF. Sometimes rules for matters that are outside the scope of the NES-PF apply to forestry activities – for example, rules relating to water yield or archaeological sites.

These rules are sometimes perceived as being more stringent by users of the regulations. Users have this perception because it is an additional requirement above the NES-PF.

The distinction between ‘scope’ and ‘stringency’ is not always clear.

10. Charging for Permitted Activity Monitoring

10.1. SUMMARY

- Councils are required to monitor and enforce compliance with the NES-PF, including for permitted activities. Ensuring there is a high degree of compliance with the regulations has a financial and administrative burden.

- To ensure appropriate monitoring of the NES-PF takes place, including for permitted activities, councils are enabled through the NES-PF to charge for monitoring certain permitted activities. There are a large number of forestry activities carried out under the NES-PF, and it is the intention that monitoring, and therefore charging, be carried out on a risk-based model.

- Councils have adopted different charging methods, although this is in line with their charging powers under the Local Government Act.

- Councils may charge for 'site compliance' work, as well as office-based risk assessments, but there is some confusion over the point at which charging is not allowed. There is overlap between the (non-chargeable) process of ensuring documentation submitted complies with the NES-PF and the (chargeable) processes of a desktop-based risk assessment and site visit planning.

- Councils and foresters are adjusting to new charges for permitted activity monitoring. Many councils are developing risk assessment matrices to help them determine where oversight and monitoring are required. Ongoing consideration of council monitoring processes to ensure they are risk-based is required to ensure good environmental outcomes and fair charging.

10.2. THE NES-PF ALLOWS CHARGING FOR MONITORING PERMITTED ACTIVITIES

The NES-PF takes a risk-based approach to forestry activities. Where the risk of adverse effects is high and council oversight is required to manage that risk, a resource consent is required. Where the risk is lower and specific requirements can be met, the activities are permitted. Prior to the NES-PF coming into force, councils made their own assessment of what activities would be permitted, and which would require resource consent. Typically, monitoring charges have only been associated with resource consents.

Councils are required to monitor and enforce compliance with the NES-PF, including for permitted activities. Ensuring there is a high degree of compliance with the regulations has a financial and administrative burden. From a practical and natural justice perspective, councils should not have to absorb the costs of monitoring permitted activities under the NES-PF.

In order to ensure appropriate monitoring would take place, the RMA was modified[43] to explicitly allow for charging for monitoring permitted activities, if enabled by a National Environmental Standard.

Regulation 106 of the RMA sets out the charging powers, and this power is enabled by sections 36(1)(cc) and 43A(8) of the RMA. Any charges set under these sections must be carried out under the usual requirements of the RMA and the Local Government Act, including:

- Use of a special consultative procedure (either through a Long-Term Plan consultation or a separate consultation);

- Establishing clear links between charges and the activities being charged for; and

- Ensuring the charges are both actual and reasonable.

[43] S36(1)(cc) of the RMA.

10.3. KEY FINDINGS ON CHARGING FOR MONITORING PERMITTED ACTIVITIES

10.3.1. Charging for monitoring permitted activities varies across regions

Regional councils have adopted different approaches to charging for permitted activity monitoring. Based on 2018/19 annual plan information, we found:

- All councils have general monitoring charges, which apply to all resource users in the region.
- We identified five councils[44] that include a specific NES-PF monitoring charge (or charges). If other councils are charging for permitted activity monitoring under the NES-PF, this appears to be through standard administrative charges, and/or a general hourly rate (which applies to all resource users).
- Councils have adopted a range of charging methods, including annual charges, fixed fees, hourly charges, and on an actual cost basis for the use of consultants.

Foresters who work across regions have told us that charging varies between regions, as does the information provided by councils about what they will charge and when they will charge for it.

10.3.2. The power to charge for permitted activities does not cover all associated actions

The NES-PF is the first national environmental standard to apply permitted activity charging.[45] It recognises the fairness of charging the resource user for monitoring. It must be done fairly and proportionately. Councils may charge for the monitoring of forestry earthworks, river crossings, quarrying, and harvesting. Monitoring applies to all conditions associated with the activity, so the charging power is quite wide.

The NES-PF empowers charging for monitoring permitted activities. Monitoring is not defined in the regulations. It allows for a broad meaning from desktop assessments through to on-site compliance visits. Current guidance is that a risk-based approach should be taken to monitoring, as councils cannot monitor all permitted activities, and do not need to. For example, a small earthworks activity on stable soils during summer creates less environmental risk than a large activity on unstable soils in poor weather.

Receiving notifications and harvest plans for a permitted activity is not a monitoring activity. The council may only check that the requirements of the regulation are included. This is not a chargeable function.

We have heard that this is a grey area for both councils and foresters. There is overlap between the (non-chargeable) process of ensuring documentation submitted includes the matters required by the NES-PF and the (chargeable) processes of a desktop-based risk assessment and site visit planning.

We expect that this tension between chargeable activities and non-chargeable activities could be reduced with appropriate support and guidance.

10.3.3. Regional councils have increased compliance processes and costs cannot always be passed on to users

Councils appear to be undertaking permitted activity monitoring in much the same way as existing consent monitoring processes (sometimes with additional specialist resources).

[44] Taranaki Regional Council, Gisborne District Council, Greater Wellington Regional Council, Nelson District Council, and Environment Southland

[45] The RMA was amended in 2017 by the Resource Legislation Amendment Act to allow councils to charge for permitted activity monitoring.

Most councils are putting in place compliance processes in relation to the NES-PF. Some councils have employed dedicated officers to undertake monitoring, and, in a few cases, compliance and outreach work.

Research prepared for Te Uru Rākau on the development of compliance processes in eight regional councils also found:

- Most councils surveyed are developing or trialling a strategy of risk-based compliance monitoring for plantation forestry;
- All the eight councils obtain activity management plans from foresters as part of the NES-PF compliance monitoring;
- Most councils request activity management plans from foresters in every instance;
- Some foresters and councils collaborate on best-practice procedures; and
- Councils' awareness of operations within the forestry sector has generally improved, but capacity for effective compliance, monitoring, and enforcement is an ongoing issue for councils.

As the activities for which charges can be levied are principally regional council functions, we have focused on regional council charging. We have not sampled district and city councils to determine the uptake of charging for permitted activity monitoring under the NES-PF at this level.

10.3.4. Foresters have concerns about charging practices for permitted activity monitoring

Foresters have expressed a range of concerns, though many of these are specific to particular councils and do not represent national charging practices. In particular:

- Some councils have increased processes to check compliance with NES-PF regulations, often where they did not previously exist. With this increased oversight, some foresters report difficulties being able to engage with councils to work through issues together.
- Transparency about charging processes encourages improved practices. Councils are not all communicating their risk and monitoring criteria, to help foresters understand the charges they face.
- Some councils have not gone through the appropriate process for putting charges in place, although this is clear in both legislation and Te Uru Rākau guidance.
- Reports of some councils possibly double-dipping by charging targeted rates for forestry activities as well as permitted activity charges.

10.3.5. Risk-based approaches to monitoring and compliance are being developed

Best-practice compliance, monitoring, and enforcement guidance published by the Ministry for the Environment[46] recommends that councils take a risk-based approach to monitoring in general. This is important because we know that compliance resources are scarce. Effort needs to be focussed on activities, land, and operators that carry the highest risk of creating adverse environmental effects.

Many councils are developing risk assessment matrices to help them determine where oversight and monitoring are required. This is good practice and should be encouraged. Councils are at various stages in developing and communicating to foresters this type of approach.

[46] *Best practice guidelines for compliance, monitoring and enforcement under the Resource Management Act 1991,* ME 1376, July 2018.

Sharing information about what activities and practices they consider to be higher risk with the forestry sector in their region should encourage improved practice in the higher-risk areas/activities. This is not the same thing as setting out where compliance and monitoring will and won't be undertaken, but it is an essential part of a conversation between foresters and councils to lift understanding and practice.

10.3.6. Some, but not all, councils are building capability and expertise for monitoring

Some councils have employed dedicated NES-PF monitoring officers partially funded by monitoring charges. This should improve forestry monitoring and thus forestry practice. Where council staff have good forestry and land management experience, this is likely to be the case. We are aware of several councils where existing or new experienced staff are in place. We also know of several regions which are sharing, or trying to share, best practice and teaching across regions. This process has been hampered by the response to COVID-19 in 2020.

We have also heard cases where compliance and monitoring staff don't yet have the requisite experience to add value through monitoring, as well as some that appear to be taking a punitive approach to forestry operations. It is too soon to say how this will develop, but it is an area where the government can assist in training and clarifying expectations.

10.4. OPTIONS TO ADDRESS ISSUES WITH CHARGING FOR MONITORING PERMITTED ACTIVITIES

We consider that all parties would benefit from greater transparency on charging for monitoring for permitted activities. Best-practice guidance is published by the Ministry for the Environment, but this doesn't include forestry-specific advice. Compliance assistance for councils will aid understanding of forestry practice and risk factors. This will also help foresters and resource users to understand the charges they face.

11. Tools Incorporated by Reference Into the NES-PF

11.1. SUMMARY

- Three information tools are incorporated by reference into Schedule 2 of the NES-PF. These are the:

    1. Erosion Susceptibility Classification (ESC);

    2. Wilding Tree Risk Calculator (WTRC); and

    3. Fish Spawning Indicator (FSI).

- The two spatial tools (ESC, FSI) are based on national datasets, which may not always reflect local conditions.

- Issues and findings related to the WTRC are inherently linked to wilding conifer management and are included in analysis relating to wilding conifer controls.

- The tools are generally functioning as intended, resulting in forests in higher-risk areas requiring consents. However, there are some interpretation issues that require clarification.

- The tools were developed using the best information available at the time, and there is no new information available at a national level that would enable us to change them at this stage. We have identified some issues that require attention so that the tools can be improved over time.

11.2. EROSION SUSCEPTIBILITY CLASSIFICATION

The Erosion Susceptibility Classification (ESC) determines the risk of erosion based on rock type, dominant erosion process, and topography. The NES-PF typically imposes fewer controls on activities conducted on lower-risk green and yellow-zoned land, and more controls over activities conducted on higher-risk orange and red-zoned land.

11.3. ISSUES WITH THE ESC

11.3.1. The ESC is being applied at a scale that is not accurate enough for site-specific assessments

The 1:50,000 scale of the ESC provides an erosion risk screening tool for operational planning but requires further interpretation so it can be applied at a larger scale.

The intent of Schedule 3 was that the management plan requires reinterpretation of the ESC at a 1:10,000 scale. This has not been translated into regulations, which allow the 1:50,000 ESC tool to be used for management planning. The management plan needs to be drawn to reflect the observed landscape rather than the overlying ESC layer.

This is a problem for both foresters and councils because it provides a misleading picture of risk, and of the appropriate status under which the activity can be carried out. For example, at a 1:50,000 scale an area may be mapped as yellow zone, meaning no resource consent is required for forestry activities. Within that zone there may be areas such as gullies that, if mapped at a smaller scale, would be red. As such they would require both resource consent and different management practices to ensure that erosion risk is managed.

It is not clear what process should ensue from these composite ESC units. Councils are managing this situation differently: some are undertaking an assessment of the unit and applying the rules appropriate to the actual classification of the area where forestry activities will take place; others are

effectively requiring red zone consents for areas that may be yellow. This level of uncertainty adds cost and time to forestry operations, and guidance on the appropriate process to follow in this instance would be beneficial.

11.3.2. Some regions have questioned the accuracy of the ESC

Some regions have questioned the accuracy of the ESC based on their own knowledge of the land. Land managers in each region were asked to ground truth the results of the ESC before it was finalised, but the underlying data comes from the New Zealand Land Resource Inventory and some of the data has not been updated since the 1970s and 1980s. It is likely that in some cases local knowledge and evidence do provide more accurate assessments of erosion risk.

Remote sensing methodologies (e.g. LiDAR) are improving and are being mapped across several regions, and new techniques such as physiographic mapping[47] may provide new forms of data to understand erosion. These may supplement the ESC, or eventually replace it, but at this stage there is no national-level data to do this.

There is a published process for challenging the validity of an ESC unit, but this was intended to address local queries. To date, the few queries we have had have been settled by clarifying the need to map at a 1:10,000 scale, and no changes have been made to the ESC. We have published guidance on our website detailing why, and how, finer-scale mapping should be done.

However, this process was not designed for remapping of whole regions, and where regional information that contradicts the ESC becomes available, Te Uru Rākau will need to consider whether, and how, more wholesale changes can be made.

11.4. FISH SPAWNING INDICATOR (FSI)

Spawning is a vulnerable time in the lifecycle of fish species. The Fish Spawning Indicator (FSI) is a tool that maps where and when fish, that are sensitive to disturbance, are spawning. The underlying data is:

- Non-migratory species habitat range data provided by the Department of Conservation;
- Habitat range of freshwater species from NIWA's Freshwater Fish Database; and
- Modelled fish habitat ranges to fill in areas where data is not available, also provided by NIWA.

The NES-PF rules only permit activities in rivers when fish are not spawning. These rules are intended to ensure that forestry activities do not occur at a time and location that is likely to disturb fish spawning.

11.5. ISSUES WITH THE FSI

The review found that information about the use of the FSI was limited. The available information was used to identify the following issues.

11.5.1. Spawning vs. presence as appropriate protection

We have heard from several stakeholders that a focus on protecting spawning times is insufficient protection for non-migratory species (e.g. galaxiids), and semi-migratory species (e.g. eels/tuna) that do not spawn in freshwater. Presence of these types of species also needs to be considered in order to achieve the protection level. To address this, three regional councils are applying more stringent rules based on localised fish data to protect some threatened fish habitats outside spawning periods.

[47] Rissman, C. et al., https://ourlandandwater.nz/future-landscapes/physiographic-environments-of-nz

Since the NES-PF came into force, the Essential Freshwater Package has been approved by Cabinet, including policies related to fish passage. This includes requirements for regional councils to develop policies for desired fish species fish passage and those that should be prevented. Councils may seek to apply more stringent rules in relation to these policies. This may affect the integrity and intent of the FSI.

11.5.2. The FSI does not contain all information on fish presence

Mātauranga relating to fish presence is not always included in the databases that underpin the FSI. Some iwi do not want to release information about taonga species. This means foresters do not always have access to mātauranga.

11.5.3. The FSI observation data is overdue to be updated

It was intended that existing and new freshwater fish observation data be integrated annually through updates to the FSI. The first update has been delayed, and this could have a negative impact on the accuracy and integrity of the tool.

11.6. OPTIONS TO ADDRESS ISSUES WITH THE FISH SPAWNING INDICATOR

There may be a need to make changes to the FSI in future as councils make those policies, but it is too early to determine what this might mean. We consider protection for fish is best considered on a cross-sectoral basis, including a determination of whether spawning times, presence, or some other factor is the appropriate indicator to prompt protections during activities in waterways. Once final policy decisions have been made on other instruments focussing on protection of freshwater fish, these discussions can be had across government. We are not proposing any structural changes to the FSI as a result of the Year One Review. However, we recommend that the FSI is updated as a matter of urgency.

12. Consistency with the One Billion Trees Programme

We considered whether changes to the afforestation and replanting provisions were needed for consistency with the One Billion Trees (1BT) programme.

The government policy to plant an additional billion trees over 10 years is designed to achieve a number of benefits, including contributing to our Paris Agreement climate change targets, increasing employment and economic development in the regions, supporting Māori land use and aspirations, and increasing environmental sustainability.

The 1BT programme is considerably wider than plantation forestry and funds a range of different types of trees and plantings across New Zealand. However, the expected increase in trees in the landscape has raised questions about potential environmental effects that are different to those explicitly covered by the NES-PF. Broadly the questions relate to:

- Catchment scale effects, such as sediment generation and downstream risk from slash mobilisation;

- The potential for forests that fall outside the NES-PF definition to generate environmental effects that are not well managed; and

- Broader effects of plantation forestry on rural communities.

The NES-PF manages the adverse environmental effects of key activities involved in 'plantation forestry'. The intent of the NES-PF was to frontload controls on afforestation, to ensure that plantation forests were not planted in areas where they would generate legacy issues, such as wilding spread or areas that cannot be harvested safely, and with due care for the surrounding environment, including downstream communities. The intention was that where afforestation of a production forest was allowed, harvest should also be allowed.

We considered whether there was potential for 1BT funding to result in poor outcomes that wouldn't be controlled by the requirements of the NES-PF:

- *Could the species planted, or the way in which they are planted, have unanticipated impacts?* Consideration was given to the potential environmental impacts of tree planting during development of operational procedures for 1BT funding. Where a planting complies with the definition of a plantation forest under the NES-PF, Grantees are required to provide a copy of their notice to councils (with correspondence) including their wilding risk score (if relevant), otherwise a resource consent is required. If this evidence is not received, Te Uru Rākau will terminate the contract. Council controls apply as with any other forest planted under the NES-PF.

- *Could certain species or forests have unanticipated cumulative effects?* In theory, adverse cumulative environmental effects from afforestation could occur at the time of planting (e.g. extensive vegetation clearance or land preparation), during the growing phase (e.g. increased water take in dry areas, wilding spread), or at harvest (e.g. simultaneous harvest of large areas increasing risk of erosion and consequent sedimentation). This is true of any planting, and in general these matters are either dealt with through the NES-PF provisions or through the power that councils retain over vegetation clearance, planning for water quantity, and greater stringency for matters relating to the NPS-FM and the New Zealand Coastal Policy Statement. The risk of simultaneous harvest of large areas remains, though in the most erosion-prone areas (red zone), controlled consent for harvest is required, and timing and duration of harvest is a matter over which councils have control.

- *Where the NES-PF doesn't apply, could plantings create adverse environmental effects?* Where exotic planting is proposed but the NES-PF doesn't apply (for example, where permanent planting is proposed), applicants are not required to supply a Wilding Tree Risk Calculator score to Te Uru Rākau. However, wilding risk is a consideration in the Technical

Forestry Assessment; if the Te Uru Rākau Forest and Land Use Adviser carrying out this assessment has concerns about the wilding risk, they can recommend an acceptable wilding risk score as a condition of approval, which would necessitate changes to the planting proposal. As noted in Section 4, there are gaps in the regulations relating to wilding tree risk. These are also likely to apply to non-plantation forest plantings if councils do not have rules managing the environmental effects of non-plantation forest plantings.

We do not consider specific changes to the afforestation and replanting conditions in the NES-PF are required in relation to the 1BT programme. Although it represents a substantial increase in public funding of trees, it is projected that the fund could enable the planting of between 50,000 and 60,000 hectares over three years, and the goal is that two-thirds of those trees will be native.

However, we have clarified that the NES-PF does not apply to all potential forest plantings. The NES-PF definition of a plantation forest includes the words ‘for harvest’, which means that permanent forests (not for harvest) are not covered by the regulations. RMA controls for these forests remain within the authority of councils, including wilding risk and any other environmental effects that the council considers require control. However, it is very likely that many councils are not aware of this, as they may assume the NES-PF covers all planted forests.

13. Existing Use Rights and Resource Consents

13.1. THE NES-PF CONTAINS NO PROVISIONS FOR EXISTING USE RIGHTS AND EXISTING CONSENTS, SO STANDARD RMA REQUIREMENTS APPLY

Many existing plantation forests were operating (legally) under existing use rights or resource consents when the NES-PF came into force.

If an activity was lawfully established, it can continue subject to the provisions of s10 and s20A of the RMA.

Existing plantation forests were considered to have an existing use right, because they were established:

1. Before the resource consent regime under the RMA came into force in 1991; or

2. As a permitted activity under the relevant plans' rules.

All a NES can do for existing consents is require a review, which the NES-PF does not do. Therefore, existing consents continue per the terms of section 44A.

An NES cannot overrule the terms of s10 and s20A of the RMA, and these sections are comprehensive, therefore these sections apply to activities now regulated by the NES-PF.

13.2. KEY FINDINGS ON EXISTING USE RIGHTS AND RESOURCE CONSENTS

13.2.1. Existing use rights are time limited for most activities covered by the NES-PF

As it is now two years since the regulations came into force, any existing use rights in relation to regional rules have expired. Foresters seeking to carry out activities under regional provisions of the NES-PF would have needed to apply for a resource consent to continue operating within 6 months of the NES-PF coming into force.

13.2.2. Existing use rights are unlikely to undermine the effectiveness of the NES-PF when they are time limited

Existing use rights are unlikely to be undermining the effectiveness of the regulations because:

- The majority of existing use rights in relation to regional rules have now expired; and

- The few remaining existing uses relate to district rules and are unlikely to significantly undermine the NES-PF's operation.

We do not consider that there is any requirement to further address existing use rights under the NES-PF.

The permitted activity rules in the NES-PF allow, subject to appropriate conditions, most of the activities that would usually be considered to have an existing use right. These permitted activity rules are generally appropriate.

14. Findings on Implementation and Technical Issues

We have identified a number of minor implementation and technical issues. These are set out in Table 4 below.

Table 4: Minor implementation and technical issues

Issue	Description	Finding
Fords – Uncertainty in terms of meaning for the use of the exemptions listed in the NES-PF.	Provisions on fords within the NES-PF are not clear: How the exemption for up to 20 axle movements per day fits into the structure of the NES-PF and RMA. In clause 46(4)(b) of the NES-PF, what is meant by the 'use of a ford' and therefore what is meant by 30 consecutive minutes after the 'use of the ford'?	Further work to determine the wording of the clauses in the NES-PF relating to fords [clauses 46(4)(b) and 97(6)(a)] to bring greater clarity is needed.
Culverts – Diameter specifications or flow rate to meet intent.	Clauses 31(4) and 46(1)(c) of the NES-PF have restricted product choice in the market as culverts that previously met the specifications no longer do. It has been proposed that the specifications be changed from a minimum inner diameter to a minimum flow rate, as the diameter of a culvert pipe indicates its ability to carry flow.	Given the complications involved with measuring flow rates, and the fact the calculations must be done on a case-by-case basis, further work is needed to determine if flow rate is a suitable alternative to culvert diameter for the NES-PF specifications.
Notice periods – the frequency of requirements if activity is undertaken continuously.	Notification to council is proving more problematic than was intended of a simple notification of commencement. These include issues such as the requirement for annual notifications in large forests where harvesting is ongoing in perpetuity, or councils not accepting annual notifications if harvest areas are not contiguous in the same forest.	These are mostly practice issues, but further work is required.
Composite LUC units – management of risks not consistent.	In zones made up of a composite of more than one unit of differing risks, the management of this situation is handled differently between councils.	The provision of guidance to councils to undertake assessments and apply appropriate rules needs further examination to ensure consistency of approach.
2km on a public road – equity treatment for forestry when compared to other commercial enterprises.	It is unclear what can be reasonably expected in consent conditions if clause 57(c) of the NES-PF is not complied with. This causes uncertainty as the conditions imposed on consents can have different permitted thresholds depending on the territorial authority responsible. The practicalities around the use of public roads for forest quarrying activity is like that of commercial quarry activity, therefore any consent conditions shouldn't unduly disadvantage forestry quarry activity compared with commercial quarries.	Further work required to assess the need for consent based on 'traffic-generating activity', which is a common matter in a district plan.
SNA/vegetation clearance – meaning unclear for incidental damage.	Clarification needed around the intent of clauses 93(1), 93(4), and 93(5)(c) of the NES-PF regarding the clearance of indigenous vegetation.	Further work is required to examine how 'incidental damage' could be defined ahead of time to ensure compliance with the 18-month timeframe for recovery.
Dual culverts – missing in the NES-PF.	Installation of two adjacent culverts is not covered in regulation 46 of the NES-PF, e.g. 2 x 1,200mm culverts. There is no permitted activity rule for this, as in this case they don't meet the battery culvert height limitation of 800mm.	Further work required to examine their inclusion.

Issue	Description	Finding
Reasonable mixing.	Neither the RMA nor the NES-PF provide a definition for the terms 'reasonable mixing' and 'visual clarity'. The guidance provided in the user guide states that councils should use their own definitions for the terms provided in their regional plans. However, not all councils have the same definitions, and some are clearer and easier to enforce than others.	Ministry for the Environment is currently working on this issue. Once they have progressed their work, this issue has the potential to be revisited to ensure councils have appropriate guidance.
Matters of discretion – Settlement Areas consideration is not allowed.	An outstanding natural waterbody under the NES-PF may include Treaty settlement areas. Discretion for a consent for doing something within or adjacent to an outstanding natural waterbody in the NES-PF does not allow a council discretion to consider the settlement legislation and values, but they must still apply Part 2 of the RMA.	Further work is needed to examine the applicability to modify matters of discretion where a consent is required for being adjacent to an outstanding natural waterbody, to include reference to relevant cultural values.
Health and Safety exemption for slash removal is unclear.	Unclear when the Health and Safety exemptions apply for slash removal – need to ensure exemption is only for genuine Health and Safety reasons.	Further work is needed to examine how to confirm in the NES-PF that to qualify for exemption it must not be possible to remove slash while complying with relevant WorkSafe guidelines issued under the HSWA (the approved COP listed).

15. Matters Relating to Climate Change and the RMA

The government has passed changes to the Resource Management Act that require local authorities to consider emission reduction plans, and national adaption plans when making certain decisions under the RMA. Depending on the content of these plans, councils may have to consider a range of additional drivers, including a number related to forestry.

These plans may have a broader effect, because forestry has a unique role as a way to sequester and store carbon. If emissions budgets give forestry a large and ongoing role in emission reductions, councils will need to consider the role of forestry in their district and region, which will also require them to carefully consider the role they expect the NES-PF to take.

15.1. ADDITIONAL TREES ARE REQUIRED TO MEET OUR CLIMATE CHANGE GOALS, AND RECENT AMENDMENTS ENCOURAGE NEW TYPES OF FORESTRY

Changes across government incentivise planting of trees for harvest, erosion control, restoration, and as permanent forest. Following the government's final policy decisions on these instruments and proposed changes to the Emissions Trading Scheme, further consideration of the interactions with the NES-PF may be required to provide certainty and consistency for all resource users.

The Climate Change Response Act includes a permanent forest category in the Emissions Trading Scheme, and this category is intended to incentivise more planting of permanent forests. Permanent forests provide an important carbon sink. The NES-PF only applies to forests planted for harvest, so forests planted with no intent to harvest (whether for restoration or carbon value) remain within the rule-making authority of councils. However, some of the potential adverse effects of permanent forests are like those of plantation forests, including the potential for wilding spread, shading of roads and dwellings and mechanical land preparation.

Not including permanent exotic forests in the NES-PF may result in councils having to develop and maintain separate rules to manage them, or situations where clear rules do not exist. There is a risk that this may create unnecessary complexity and make it difficult for some resource users to understand what they need to do to comply with the RMA.

16. Conclusion and Next Steps

In December 2018, Forestry Ministers agreed a Terms of Reference for Te Uru Rākau and the Ministry for the Environment to review the implementation of the NES-PF (the review) once the regulations had been in force for one year. Those Terms relate to:

a) Specific environmental effects, including wilding controls, slash (on-site harvest residue such as branches) management, and biodiversity;

b) Council implementation, including council plan stringency, plan alignment, and charging for permitted activity monitoring;

c) The three decision support tools and their effectiveness;

d) Consistency with the One Billion Trees programme; and

e) Other matters such as existing use rights and resource consents, and issues and trends arising from implementation.

The review found that, overall, the NES-PF is effective, but some changes could improve environmental outcomes in certain areas. Regulation changes could be made to improve environmental outcomes relating to wilding conifer controls, slash management, biodiversity, and other minor areas.

For specific environmental effects, improving environmental outcomes requires comprehensive implementation support. The NES-PF is not designed to achieve environmental outcomes in isolation from other regulatory instruments and forestry industry practice. Regulation, and regulatory changes, are most successful when supported with non-legislative tools.

16.1. SUMMARY OF FINDINGS

16.1.1. Wilding risk controls

We found that changes to the calculator are needed to adjust some of the settings in the calculator, align how afforestation and replanting are treated, and strengthen the requirements about who is qualified to use it.

16.1.2. Slash (on-site harvest residue) management

We found that slash management requirements in the NES-PF, and its overall activity status, are generally appropriate. Changes could clarify and strengthen the controls and reduce accumulation of slash.

Amendments to the regulations could be made to increase clarity and strengthen controls for slash management.

Most improvements for slash management are better suited to non-regulatory approaches, including education and training, due to the highly site-specific nature of slash management.

Environmental outcomes and safety can be improved by wider adherence to best practice for both councils and foresters. Proactively upskilling both foresters and councils through guidance and training for slash management is one means of achieving best forestry practice.

16.1.3. Biodiversity

Plantation forests provide habitat for indigenous biodiversity, which is most vulnerable when harvesting occurs. A National Policy Statement for Indigenous Biodiversity is being developed, which will assist in providing a framework for managing threatened and at-risk species in plantation forests.

The balance between the use of land for forestry and the protection of the indigenous flora and fauna it harbours is critical in terms of meeting environmental and economic outcomes.

Minor changes to the regulations could be made to improve clarity and accountability with respect to biodiversity.

16.1.4. Council plan stringency

The stringency provisions are drafted to enable councils to comply with all RMA obligations. In some cases, the use of stringency has undermined the ability of the NES-PF to provide a nationally consistent rule set and some foresters continue to see a range of different rules in different regions. Guidance and implementation assistance could improve the quality and consistency of rules in the long term, including better integration across instruments of national direction.

16.1.5. Council plan alignment

NES-PF regulations are primarily regional rules, and most regional and unitary councils have undertaken, or are undertaking, alignment of the major parts of their regional plans that deal with forestry.

16.1.6. Charging for permitted activity monitoring

Councils are required to monitor and enforce compliance with the NES-PF, including for permitted activities, and may charge to do so. Training and guidance on monitoring and charging for permitted activities, including adoption of risk-based best practices, could be beneficial.

16.1.7. Tools incorporated by reference into the NES-PF

The Erosion Susceptibility Classification (ESC)

No changes to the ESC tool have been identified through the review.

Fish Spawning Indicator (FSI)

No changes to the FSI other than a planned update of the underlying data have been identified through the review.

16.1.8. Existing use rights and resource consents

We found that existing use rights and existing consents are unlikely to be undermining the effectiveness of the NES-PF. If a council considers that an existing consent is not sufficient to manage the effects of the activity, it has review powers under section 128 of the RMA.

16.1.9. Consistency with the One Billion Trees programme

In general, the NES-PF provisions were found to be consistent with the objectives of the One Billion Trees programme. However, during the review we clarified that permanent forests (not for harvest) are not covered by the NES-PF. RMA controls for these forests remain within the authority of councils, including wilding risk and any other environmental effects that the council considers require control. However, it is also likely that many councils are not aware of this as they may assume the NES-PF covers all planted forests.

16.1.10. Issues and trends that have arisen from implementing the regulations during the first year

Where issues raised were linked to matters included in the terms of reference, we have incorporated these into the substantive findings of the review. In a number of cases these relate to the capacity and capability of foresters and local authorities to interpret and implement the NES-PF in line with its intent.

A number of smaller issues around the workability of the regulations have also been identified by stakeholders and will be worked through with a view to addressing these in any future regulatory change.

Feedback from councils and the forestry sector is that they need support to ensure the NES-PF is well understood and can be consistently and effectively implemented. This is most needed where councils lack capacity and experience with forestry activities, and for foresters who lack experience in identifying and managing environmental risks associated with plantation forestry.

16.2. NEXT STEPS

This report and its findings will be considered by Forestry Ministers in order to make decisions on the next steps. If change is progressed that is more than minor and/or technical, consultation on these matters will be undertaken in line with the Resource Management Act.

16.2.1. The structure, form, and implementation of other regulatory programmes affects the NES-PF, even if their topic does not directly affect land use

In July 2019, the Minister for the Environment announced a comprehensive review of the resource management system, to be completed by an independent Resource Management Review Panel (the Panel). We understand the Panel's report will soon be made publicly available. Going forward, the NES-PF will need to be considered in the context of a much wider reform programme.

Several other RMA work programmes have been completed since the gazettal of the NES-PF, or are progressing concurrently with this review, including:

- The National Policy Statement for Urban Development;
- The implementation of the National Planning Standards;
- Fast Track Consenting to support the COVID-19 recovery; and
- Other reviews of national environmental standards.

These programmes are part of the broader RMA ecosystem, and while they do not interface directly with the NES-PF, they are implemented by the same organisations and fit in similar structures. Ensuring that, where possible, the NES-PF avoids duplication and uses similar administrative processes enables councils and stakeholders to interact consistently across the RMA system.

Appendix One: Terms of Reference for the Year One Review of NES-PF

The review will cover these specific matters.

Implementation issues:

a. The extent to which councils have aligned their plans with the NES-PF (as required by section 44A of the RMA) and where they have applied more stringent rules than those in the NES-PF, as enabled through regulation 6;

b. The way in which charging to monitor permitted activities has been implemented, and the impact (if any) this is having on councils and foresters and the objectives of the NES-PF;

c. The issues and trends that have arisen from implementing the regulations during the first year;

d. Whether changes are required to the three decision support tools incorporated by reference in the NES-PF (the Erosion Susceptibility Classification, the Fish Spawning Indicator, and the Wilding Tree Risk Calculator), including whether the Wilding Tree Risk Calculator can be made into a spatial tool; and

e. Whether foresters operating under existing resource consents or who have existing use rights under section 10 of the RMA can be subject to controls under the NES-PF.

Specific issues that have arisen since gazettal:

a. Whether the settings in the NES-PF relating to harvesting and slash management are appropriate for controlling the environmental effects of plantation forestry on erosion-prone land, including whether the controls for ESC orange and red-zone land are too narrow;

b. Whether any changes to the afforestation and replanting provisions in the NES-PF are needed to ensure it is consistent with the One Billion Trees programme;

c. The wilding tree controls within the context of the government's Wilding Conifer Management Strategy; and

d. Biodiversity protections in the NES-PF, including protections for indigenous flora and mobile fauna like birds and fish.

Annexure 5

Wednesday, January 18, 2023 at 21:15:59 New Zealand Daylight Time

Subject: LGOIMA Request - Forestry
Date: Thursday, 14 April 2022 at 1:11:27 PM New Zealand Standard Time
From: Bridget McCulloch-8127 on behalf of Tony Quirk-8077
To: Shay Schlaepfer
Attachments: Picture (Device Independent Bitmap) 1.jpg, FW Template.pdf

Hi Shay

I refer to your LGOIMA request dated 22 March and respond to the extent possible as follows:

1. **When was the notification system, whereby forestry operators could notify the Council of permitted NESPF activities, introduced?**

   The notification system commenced when the NES-PF came into force and that was 1 May 2018.

2. **Since the notification was introduced, how many activities under the NESPF have been approved by MDC annually and how many forestry resource consents have been approved annually.**

   Number of NES-PF notifications – 2018 – 63; 2019 – 80; 2020 – 74; 2021 – 89; 2022 – 7
   Forestry resource consents granted – 2018 – 13; 2019 – 9; 2020 – 17; 2021 – 15; 2022 – 4

3. **Any GIS Shapefiles which show NESPF notification of forestry operations and forestry resource consents.**

   To provide the full data in answer to this question would require that an officer go through each of the 300 plus applications. This is a considerable amount of effort and cost. It is unlikely that even with reimbursement of expenses we would have the officer resource. It is suggested you could access www.remotehq.co.nz in the first instance. It is understood this has all the Shapefiles we have received entered on to maps. If this is not adequate, then we would need to address whether or not s17 LGOIMA is applied which is refusal because of the collation and research needed.

4. **All of MDC's submissions on the NESPF as notified and any subsequent notified versions.**

   Attached material provided to me.

   https://marlboroughdistrictcouncil.sharefile.com/d-s3a3c591d3f68424ab26e24c5531df7d1

5. **All of MDC's correspondence with the Ministry of Primary Industries, etc relating to the Erosion Susceptibility Classification**.

   Attached material provided to me.

   https://marlboroughdistrictcouncil.sharefile.com/d-sc600fab27d21485c90e18ce38d4681a5

6. **All MDC reports (including those undertaken by contractors) commissioned in response to Cyclone Gita (in 2018) that relate to forestry related effects and/or sedimentation caused by the cyclone.**

   When looking at the reports in question, it is noted the reports were prepared for the purpose of Compliance investigation.

   Those reports are withheld in terms of s6 LGOIMA which relates to the likely prejudice for prevention for investigation and detection of offences. It is vital that the Compliance team are able to assess report, determine relevance of material for possible Compliance consideration and to then assess what action is appropriate in all the circumstances.

   It is important that the Compliance team can maintain confidentiality with such investigations and assessments. It may enable them to work more cooperatively with an alleged offender. There are also situations where an alleged offender might be more prepared to provide information, if information is kept confidential. For this it is seen that s7(2)(c)(i) applies. There is also the ability to allow free and frank expressions of opinion, especially related to Compliance matters, the ground for which would be s7(2)(f)(i).

7. **A copy of the formal warning given in relation to NESPF activities.**

   Attached is a template of the formal warning used.

8. **A copy of all the abatement notices, infringement notices and formal warnings referred to below.**

   2017/2018 – 2 x abatement notices, 10 x infringements, 1 x prosecution
   2018/2019 – 3 x infringements
   2019/2020 – 2 x infringements, 1 x formal warning

   For all abatement notices and infringement notices the information is withheld for the reason given above under s6, etc.

   The one prosecution was 2019 NZDC2602. The material that is available can be sourced by you from Court records using that reference.

9. **MDC's evidence and legal submissions from all forestry related prosecutions undertaken since 2018 (including but not limited to decisions, 2019 NSDC 2602; 2021 NZ EnvC 198 and the case referred to in the article quoted, which I am advised may well be the 2019 NZDC 2602 case.**

   We recommend that you source the evidence and submissions presented in the case related to 2019 NZDC 2602.

   The Stuff article appears to relate to a Court action CRI-2017-006-000593 MDC v Heagney, Woodward and Merrill & Ring NZ Ltd and you could access the Court file for details.

   In the case of the Environment Court, we are advised those proceeding are still before the Court and therefore the submissions are not available. You will be able to access the Court file in terms of any information that is available.

10. **Any Council evidence/reports relating to the effect of plantation forestry on the freshwater and coastal environments (since 1 January 2018).**

    The link for this report is:
    https://www.marlborough.govt.nz/repository/libraries/id:1w1mps0ir17q9sgxanf9/hierarchy/Documents/Environment/Coastal/Sedimentation%20Reports%20List/Sources_of_fine_sediment_Pelorus-NIWA_report.PDF

General
We have done our best to provide you with responses to the questions raised. When coupled with your first request, we have now expended a considerable amount of time and resource.

Further requests may well trigger a requirement for costs to be paid.

Tony Quirk
District Secretary

MARLBOROUGH DISTRICT COUNCIL

Phone: 03 520 7400

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Blenheim 7240, New Zealand
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Attachment 9

Minute of the Environment Court dated 7 February 2023

IN THE ENVIRONMENT COURT
AT CHRISTCHURCH

I TE KŌTI TAIAO O AOTEAROA
KI ŌTAUTAHI

IN THE MATTER	of the Resource Management Act 1991
AND	an application for declarations under section 310 of the Act
BETWEEN	ENVIRONMENT DEFENCE SOCIETY INCORPORATED
	(ENV-2023-CHC-2)
	Applicant
AND	MARLBOROUGH DISTRICT COUNCIL
	Respondent

MINUTE OF THE ENVIRONMENT COURT
(7 February 2023)

Introduction

[1] The court has received an application for declaration by the Environment Defence Society Inc. ('EDS') in relation to plantation forestry operations being undertaken on erosion prone land. The application was accompanied by a number of affidavits in support.

[2] EDS has also filed a memorandum in support which sets out an overview of the declarations sought, case study and proposed directions. The application pertains to activities in Marlborough district. In addition to relevant regional and district plans, the application also pertains to the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 ('NES-PF').

[3] The following persons have been identified as being directly affected by the application:

(a) Marlborough District Council;
(b) Forest Owners Association;
(c) Minister of Forestry;
(d) Minister for the Environment;
(e) Iwi Authorities identified by the Regional Policy Statement as tangata whenua in the Marlborough region: Ngāti Apa, Ngāti Kōata, Ngāti Kuia, Ngāti Rārua, Ngāti Toa, Ngāi Tahu, Rangitāne and Te Ātiawa.

[4] The NES-PF recently featured in the media in the context of forestry slash impacts in Tairāwhiti Gisborne following last month's Cyclone Hale. The application does not pertain to that region per se, being concerned with what may be transpiring in Marlborough. However, it does challenge the legality of aspects of the NES-PF. As such, counsel for EDS properly notes that declarations sought may have wider industry-wide and public interest significance.

[5] However, EDS does not consider other persons to be directly affected beyond those it has identified such that personal service of the application is required. Counsel points out that any other person who may be interested in the declarations may become a party to the proceedings if they meet the requirements in s274 RMA.

[6] I consider the proposed directions around service are acceptable, subject to adding Crown Law in view of the potential whole-of-Government interest in the proceeding. Media coverage can be anticipated in view of the present media profile of the NES-PF and this should assist to alert any others who may be interested in joining under s274.

[7] I note that EDS seeks that, following a judicial teleconference, a mediation date be allocated for these proceedings. The court would usually sets down a timetable for opposition, replies and submissions in the first instance for

declaration proceedings, but if all parties consider there is merit in attending mediation first then the court would be open to directing this. I agree, however, that a prior step should be to convene a judicial teleconference. That is advantageous here given these are declaratory proceedings such that any declaratory outcome must ultimately be a matter of judicial determination.

Directions

[8] Accordingly, I direct:

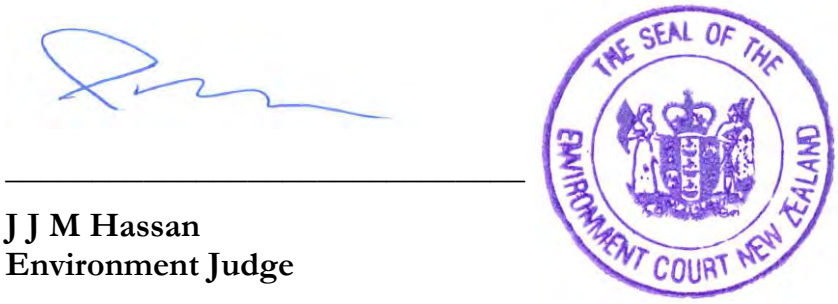
(a) EDS is to electronically serve the notice of application, supporting affidavits and a copy of this Minute, on the parties listed in [3] above and on the Crown Law Office by **Friday 10 February 2023**;

(b) any of those persons who wishes to oppose the application must lodge and serve, by **Friday 3 March 2023**:
   (i) a notice of opposition specifying grounds; and
   (ii) any affidavits stating the evidence relied on in support of (a).

(c) EDS is to confer with parties and file a case management memorandum by **Friday 10 March 2023** setting out matters proposed for discussion at an initial judicial conference including:
   (i) whether there is agreement for the proceedings to be referred to mediation (and if so, proposed dates parties are available);
   (ii) if mediation is not agreed, a proposed timetable for any affidavits in reply, legal submissions and any other hearing related directions required to determine the proceedings efficiently.

(d) unless the court then determines that directions can be properly made without the need for a judicial teleconference ('JTC'), parties are to ensure they are available at short notice for a JTC at a date to be confirmed by the case manager.

[9] Leave is reserved for any party to apply for further (or other) directions.



J J M Hassan
Environment Judge

Issued: 7 February 2023

Attachment 10

Joint Memorandum of Counsel dated 20 February 2023

IN THE ENVIRONMENT COURT
AT CHRISTCHURCH

I TE KŌTI TAIAO O AOTEAROA
KI ŌTAUTAHI

ENV-2023-CHC-00002

IN THE MATTER OF	**of the Resource Management Act 1991**
AND IN THE MATTER OF	**an application for declarations under section 310 of the Act**
BETWEEN	**ENVIRONMENT DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

JOINT MEMORANDUM OF COUNSEL IN RELATION TO DEADLINE FOR AFFIDAVITS

20 February 2023

CROWN LAW
TE TARI TURE O TE KARAUNA
PO Box 2858
Wellington 6140
Tel: 04 472 1719

Contact Person:
Amy Hill / Shannon Eldridge
Amy.Hill@crownlaw.govt.nz / Shannon.Eldridge@crownlaw.govt.nz

MAY IT PLEASE THE COURT:

1. This is a joint memorandum of counsel filed on behalf of the following parties:

    1.1 the Minister for the Environment and the Minister of Forestry (**the Ministers**);

    1.2 Marlborough District Council (**MDC**); and

    1.3 the New Zealand Forest Owners Association Incorporated (**NZFOA**).

2. On 8 February 2023 the Environmental Defence Society Inc (**EDS**) served the above parties with a copy of the notice of application, application for declarations, supporting affidavits and a copy of the Court's Minute dated 7 February 2023 (**the Minute**).

3. The Minute directs at [8](b):

> any of those persons who wishes to oppose the application must lodge and serve, by Friday 3 March 2023:
>
> (i) a notice of opposition specifying grounds; and
>
> (ii) any affidavits stating the evidence relied on in support of (a).

4. Leave was reserved for any party to apply for further (or other) directions.

Other directions sought

5. The Ministers, MDC, and NZFOA are currently determining their positions in respect of the proceedings. However they have identified that they would not be in a position to file affidavits in support of any notices filed by 3 March 2023.

6. The contents of the affidavits filed by EDS are technical and detailed in nature. The Ministers, MDC, and NZFOA would require more time to respond to the affidavits filed by EDS, instruct expert witnesses where required, and identify relevant documentation to inform their evidence.

7. The parties respectfully seek a variation of the directions at [8](b) of the Minute as follows:

7.1 Any persons who wish to join the proceedings must:

7.1.1 lodge and serve a notice of support or opposition specifying grounds by Friday 3 March 2023; and

7.1.2 lodge and serve any affidavits stating the evidence relied on in support of (a) by 3 April 2023.

8. Notwithstanding, the parties consider that the direction at [8](c) relating to the filing of a case management memorandum by 10 March 2023 can be met.

EDS view

9. Counsel have conferred with counsel for EDS. Counsel for EDS have confirmed EDS does not object to the directions sought as set out above.

10. EDS also request that those parties seeking to join the proceedings indicate whether they are agreeable to the proceedings being referred to mediation on this same date (3 March 2023). The Ministers, NZFOA, and MDC have no objection to doing so.

20 February 2023

G Chappell
Counsel for the New Zealand Forest Owners Association Inc

A Hill / S Eldridge
Counsel for the Minister for the Environment and Minister of Forestry

J Maassen
Counsel for Marlborough District Council

TO: The Registrar of the Environment Court of New Zealand.

AND TO: The Applicant.

Attachment 11

Environment Court directions email dated 20 February 2023

From:	McKee, Christine
To:	Amy Hill; Rob Enright; CWoodhouse@ellisgould.co.nz; John Maassen; Kim Lawson; Gill Chappell; Shannon Eldridge
Subject:	ENV-2023-CHC-02 EDS Declaration on NES Plantation Forestry
Date:	Monday, 20 February 2023 3:03:39 PM
Attachments:	image003.png 7196871_NES_ Joint memorandum of counsel - 20 February 2023.PDF

Good afternoon

In response to the attached memorandum, Judge Hassan directs:

Request granted, any persons who wish to join the proceedings must:

a. lodge and serve a notice of support or opposition specifying grounds (and indicate whether they are agreeable to the proceedings being referred to mediation) by **Friday 3 March 2023**; and
b. lodge and serve any affidavits stating the evidence relied on in support of (a) by **3 April 2023**.
c. EDS is to confer with parties and file a case management memorandum by Friday **10 March 2023** as previously directed.

J J M Hassan
Environment Judge
20 February 2023

Kind regards,

Chrissie McKee
Case/Hearing Manager
Environment Court of New Zealand | Land Valuation Tribunal
| 20 Lichfield Street | PO Box 2069 | WX11113 | Christchurch
E-mail: Chrissie.McKee@justice.govt.nz
Website: https://environmentcourt.govt.nz/

IN THE ENVIRONMENT COURT
AT CHRISTCHURCH

I TE KŌTI TAIAO O AOTEAROA
KI ŌTAUTAHI

ENV-2023-CHC-00002

IN THE MATTER OF	**of the Resource Management Act 1991**
AND IN THE MATTER OF	**an application for declarations under section 310 of the Act**
BETWEEN	**ENVIRONMENT DEFENCE SOCIETY INCORPORATED**
	Applicant
AND	**MARLBOROUGH DISTRICT COUNCIL**
	Respondent

JOINT MEMORANDUM OF COUNSEL IN RELATION TO DEADLINE FOR AFFIDAVITS

20 February 2023

CROWN LAW
TE TARI TURE O TE KARAUNA
PO Box 2858
Wellington 6140
Tel: 04 472 1719

Contact Person:
Amy Hill / Shannon Eldridge
Amy.Hill@crownlaw.govt.nz / Shannon.Eldridge@crownlaw.govt.nz

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20 February 2023

G Chappell
Counsel for the New Zealand Forest Owners Association Inc

A Hill / S Eldridge
Counsel for the Minister for the Environment and Minister of Forestry

J Maassen
Counsel for Marlborough District Council

TO: The Registrar of the Environment Court of New Zealand.

AND TO: The Applicant.