

Brief to Mana Taiao Tairāwhiti to support with Tairāwhiti Land Use Inquiry

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1. We submit that: due to the unique landscape of Te Tairāwhiti, adhering to Clause 69 of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 (NES-PF) is not possible for many Te Tairāwhiti's pine plantation forest blocks.

Key Recommendations

2. We recommend immediate cessation of all clear-fell harvesting of pine plantations in “very high-risk” (red) and “high-risk” (orange) as defined by NES-PF Erosion Susceptibility Classification (ESC)¹.
3. We recommend the reforestation of recently harvested areas and transitioning existing “very high-risk” (red) and “high-risk” (orange) plantations to old-growth native forests².
4. We recommend investigating the potential for on-site slash removals, such as chipping and biomass processing, and bio-energy with carbon capture and storage (BECCS).

Supporting information

Cyclones and human-induced climate change

5. Tropical Cyclones that form in the tropics but then migrate out of the Tropics towards Aotearoa New Zealand, always become extratropical cyclones. Cyclone Gabrielle was an extratropical cyclone. Extratropical cyclones have always impacted Aotearoa New Zealand. While there is little robust evidence as to whether the **frequency** of extratropical cyclones making landfall in Aotearoa New Zealand is increasing or decreasing, there is evidence that the **intensity** of such events may increase due to climate change (Figure 1).
6. A priority study by the global organisation World Weather Attribution found a “relationship between historical weather station data (1979-2023) and global mean

¹ See Figure 1.

² Available here: https://mpi_nes.cloud.eaglegis.co.nz/NESPF/

temperature to extrapolate back to colder climates, we found that the 2-day maximum rainfall over Te Matau-a-Māui/Te Tairāwhiti region is now about 30% more intense than it might have been had human greenhouse gas emissions not warmed the climate by 1.2°C. This also means a rainfall event of this magnitude is now about four times more likely to happen than it was when the world was 1.2°C cooler than it is today.” (Harrington et al 2023). They suggest that events like this are rare but will be made increasingly likely with future warming that the world will experience in the coming decades.

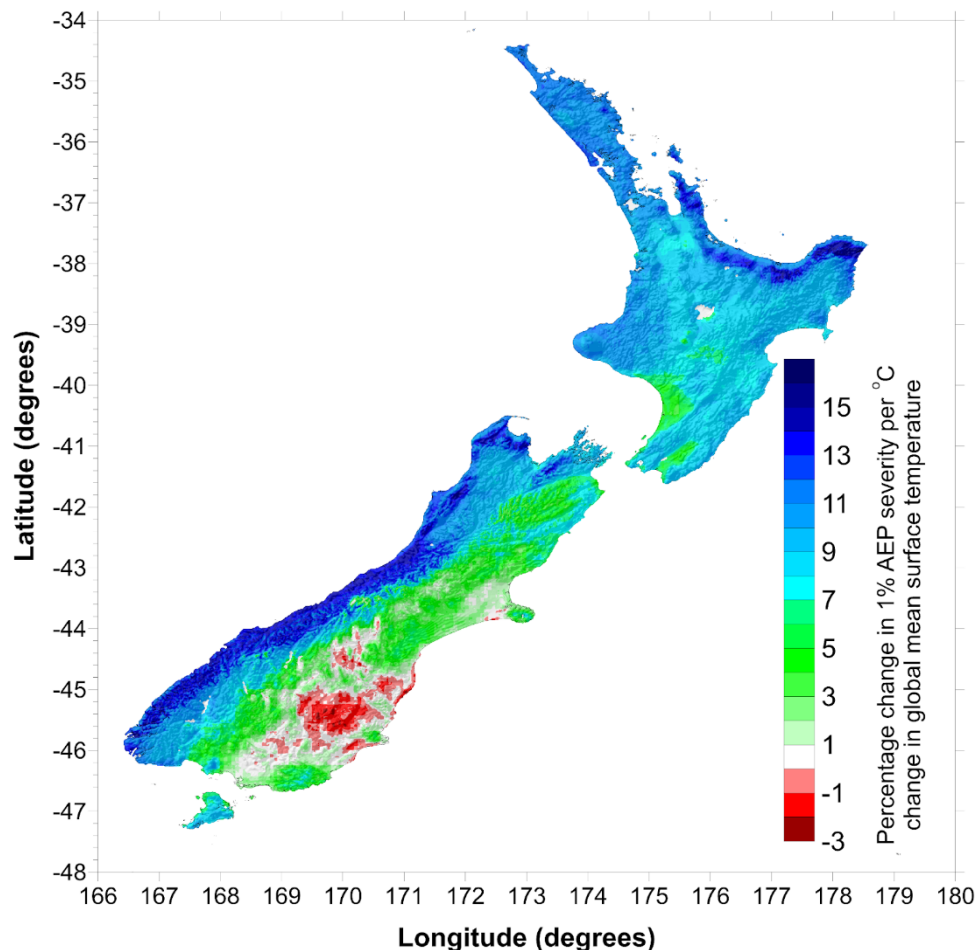


Figure 1. Measured daily rainfall where we have inferred how the intensity of 1-in-100 year rainfall events (1% annual exceedance probability; AEP) is likely to change with increasing global temperatures

7. Storm events cause:

- 7.1. **Mobilisation of slash** and debris flows ([Debris flows info sheet.pdf \(scionresearch.com\)](#)), Melia et al. 2019.
- 7.2. Windthrow (trees blown over) (Basher et al. 2012) and stem snap ([Climate-change-Info-Sheet wind.pdf \(scionresearch.com\)](#))
- 7.3. River flooding and coastal storm surge.

Erosion Susceptibility

8. Te Tairāwhiti contains the largest concentration of “very high risk” or ‘red-zone’ land outside of the high alpine areas of the South Island (Figure 2).

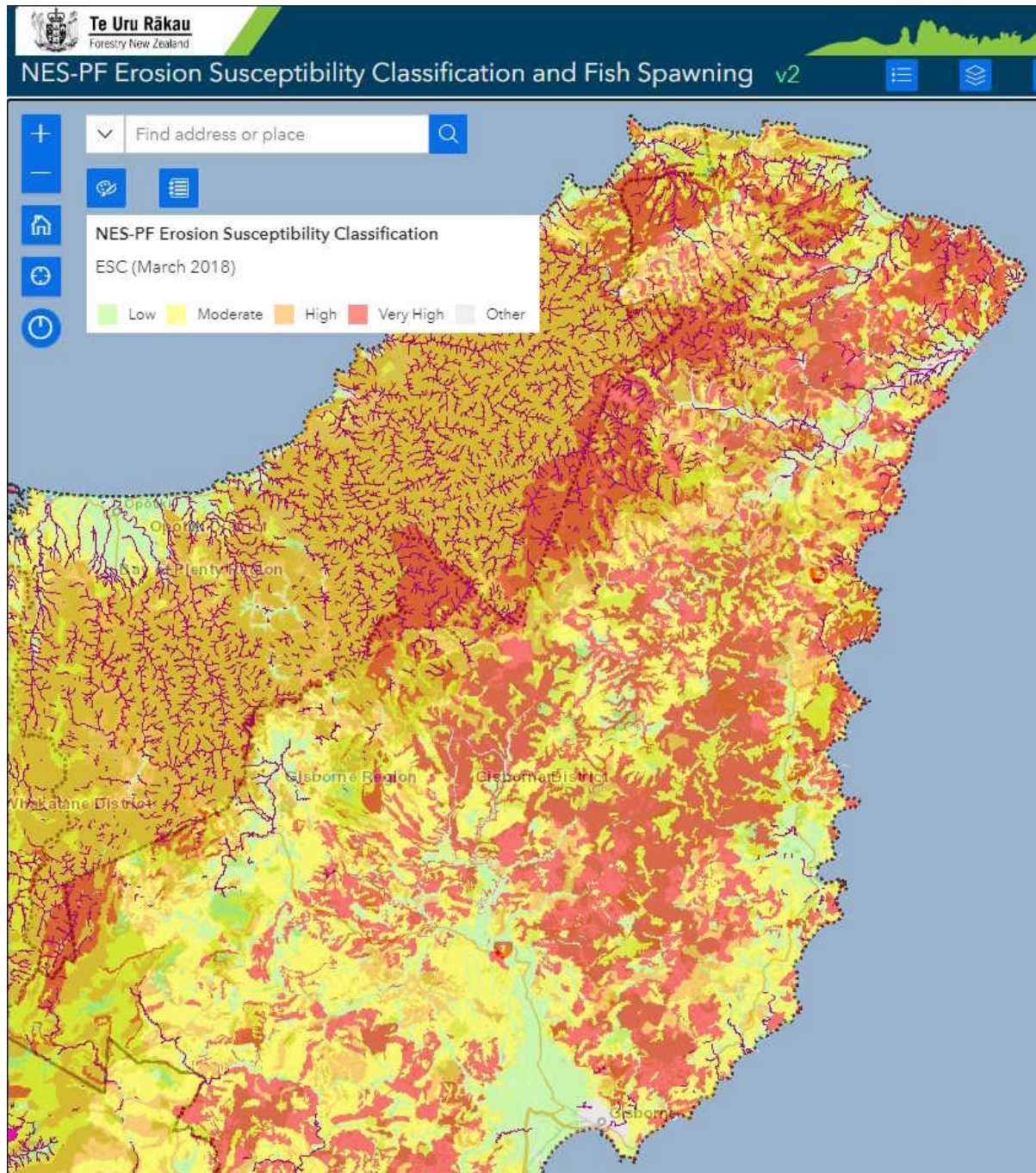


Figure 2. MPI National Environmental Standards for Plantation Forestry Erosion Susceptibility Classification for Tairāwhiti “very high risk” or ‘red-zone’ areas from https://mpi_nes.cloud.eaglegis.co.nz/NESPF/.

9. As evident in the Hawke's Bay silt events, pine trees do a good job of mitigating erosion compared to pasture, although pine plantations are not as robust as old-growth native forests in defending East Coast landscapes.
 - 9.1. However, there is a window of vulnerability for land cleared of pine plantations and recently planted with juvenile pines **under eight years old** (Phillips et al. 2012, Marden 1991, Marden and Rowan 1993).
 - 9.2. The land is vulnerable between 2-8 years once pine plantations have been clear-felled up until pine plantations have been re-established. During this window of vulnerability, the landscape is susceptible to erosion during storm events.
10. *Pinus radiata* is the dominant plantation species in the area; it is harvested via clear-felling approximately 28 years post-planting. The last planting cycle was in the early 1990s. Multiple flooding, slash, and forest debris events have occurred in Tairāwhiti in the last five years following clear-fell harvesting of the 1990s planting cycle.

Forestry 'Slash'

11. Slash is left on-site post-harvest to return nutrients to next rotation on stable central north island plantations e.g. Kaingaroa Forest. This approach works better than fertiliser (Smaill et al. 2008).
12. Slash can be mobilised in storm events from steep-land forests (Garrett et al. 2015).
13. Slash used to be burnt (Visser 2016), but: Burning inhibits native forest regeneration and councils regulated against burning.
14. Slash management is regulated under National Environmental Standards for Plantation Forestry (NES-PF) – pruning and thinning permitted activity is a permitted activity.

Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 (NES-PF)

15. The New Zealand Legislation relevant to slash and debris management with reference for flooding is contained within the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017. Clause 69 of this legislation reads as follows:



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.

Resource Management (National Environmental Standards for
Plantation Forestry) Regulations 2017

16. Annual exceedance probability (AEP):

- a. AEP means the annual exceedance probability, which is the chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage.
- b. A 5% AEP is equivalent to a 1 in 20-year event.
- c. Due to increased precipitation from climate change AEP is a non-stationary number and should to be given baseline e.g. an AEP (for 1990 – 2010).

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