

EVANS ATTACHMENT 1

Information Requested under Section 92 of the Resource Management Act 1991

Application Number/s: CRC223481

Date: 21/03/2022

1. Ecological impacts

I have received advice from the Canterbury Regional Council (CRC) Environmental Science and Hazards team, who consider the plantation forestry land use applied for under this consent could have adverse effects on indigenous biodiversity and ecosystems, both in terms of direct (on-site) effects and cross boundary (off-site) effects. The application area and surrounding area appears to contain habitats and ecosystems likely to support significant indigenous biodiversity (such as rocky outcrops) and is likely to be habitat for threatened/ at risk fauna such as native lizards.

- a. Therefore, please describe measures to be taken to ensure no loss of significant indigenous biodiversity or indigenous biodiversity values as a result of the proposal. Include a monitoring plan designed to detect presence/absence of adverse effects and how and detected adverse environmental effects will be addressed.

Due to these boulder areas being unplatable they will be excluded from the planting area. This means the habitat of indigenous flora and fauna disturbance will be minimised. When these areas are identified, natural buffer zones between the trees and the boulders will be formed until soil depth is deep enough to support tree growth. This often needs to be >300mm. As a lot of these boulder areas have been classified as Significant natural areas afforestation must follow the rules stated in the National Environment Standard for Plantation Forestry (NES-PF). Policy 12 states: "Afforestation must not occur in a Significant Natural Area." The NES-PF also states that under Policy 14.3(b): "afforestation must not occur with 10m of a Significant Natural Area. By following these rules we will ensure there will be no disturbance or modification within 10m of a Significant Natural Area which will help preserve indigenous biodiversity or indigenous biodiversity values.

Afforestation of the proposed surrounding area will help increase the biodiversity of native flora and fauna in these rocky areas as grazing and afforestation will be excluded. Excluding cattle and sheep grazing will give native vegetation the opportunity to establish permanently as it is no longer being rotationally grazed. Stock will often seek these rocky areas for shade and shelter. Removing them from these areas will reduce soil compaction and tracking which will allow the indigenous flora and fauna to recover from trampling.

As we don't plan on planting these rocky areas for the reasons stated above then there would be no need to monitor the area for adverse effects.

I note that Canterbury Regional Policy Statement (CRPS) Policy 9.3.1: 'Protecting significant natural areas' and in particular Policy 9.3.1(3) "Areas identified as significant will be protected to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities."

- a. Please provide an assessment of ecological significance of both directly and potentially affected areas against CRPS criteria.

The National Environmental Standard for Plantation Forestry (NES-PF) is a national framework that all forestry activities must follow, with afforestation being one of them. Policy 12 states: "Afforestation must not occur in a Significant Natural Area." The NES-PF also states that under Policy 14.3(b): "afforestation must not occur within 10m of a Significant Natural Area. By following these rules we will ensure there will be no disturbance or modification within 10m of a Significant Natural Area which will help preserve indigenous biodiversity or indigenous biodiversity values.

2. Surface water and ecology

I sought advice from CRC surface water and ecology team who noted that the application states that there are no flowing waterways under the footprint of the proposed development area. However, there are likely intermittent if not at least ephemeral channels associated with this development area. These ephemeral systems are important sources of river catchments and their stability. In addition, the Taiko stream flows adjacent to the proposed development area, within 100m at some places. Therefore, it is useful to understand the relevant ecological values of this stream to assess the level of compliance of this development with national/regional policies and regulations outlined in the application.

- a. Please provide information on how the applicant plans to manage sediment loading and plantation debris accumulation in the waterways with and adjacent to the proposed development area (this applies to the other afforestation applications too).

Appendix 1 shows images of significant gully erosion and under runners that are occurring on the steep slopes that are proposed for planting. Afforesting these areas will help stabilise the ground once canopy closure occurs. The tree canopy will intercept heavy rain to slow its velocity before hitting the ground and slow seepage into the subgrade which increases cohesion in the soil structure and prevent slippage. Once the trees develop their root structure they will help bind the soil together and reduce the amount of erosion. Over time this will prevent sediment runoff into the Taiko stream, therefore increasing water quality for the native fauna that inhabit the waterway.

The owner has already fenced off 2km of the Taiko Stream from his farming operation and planted native species under his own funding to allow the development of native flora and fauna. This 20m exclusion area acts as an additional buffer from the afforestation project.

Debris from the plantations will be easily managed as there are no steep slopes present to encourage sliding from the top of the block to the bottom. As forest debris is associated with harvesting we must follow the NES-PF in regards to harvesting near waterways, sediment management and slash management. As none of the proposed planting area is within 100m of the stream then the risk of any slash build up or sediment runoff is highly unlikely as there are flat areas of pasture between the proposed forest and the stream. These pasture paddocks will not only act in slowing velocity of any sediment but also act as a filter and buffer.

- b. Please provide the details of the setback limits (proposed buffer areas) for this activity, especially related to the sensitive freshwater habitats next to the development area.

The NES-PF states in Policy 14.3(a) that: “No afforestation must occur within 5m either side of any perennial river <3m in width.” This clause will apply to some ephemeral water courses as often these channels will be unable to support tree species like radiata as they do not like “wet feet” or a saturated root system. This means buffer zones will be applied to these areas which will allow native reeds or rushes to establish as cattle and sheep grazing has been excluded. This will give the opportunity for native flora and fauna to establish with the potential of wetlands to form.

The owner has already fenced off the Taiko Stream from his farming operation and planted native species under his own funding to allow the development of native flora and fauna. This 20m exclusion area acts as an additional buffer from the afforestation project.

- c. Please provide an assessment of the Taiko stream’s ecological values based on available information including but not limited to the general habitat types, riparian features and more importantly fish biodiversity (as per NIWA-New Zealand Freshwater Fish Database and relevant ECan Map layers), current conservation status of the fish, the occurrence of any spawning habitats.

In areas of the Taiko Stream which will be affected by the afforestation there appears to be “Modelled” *Salmo trutta* (Brown Trout) and *Neochanna burrowsius* (Mudfish) spawning grounds. Brown trout are currently classified as a “group A” species which is a species with a conservation status of threatened or at risk, while the mudfish is a “Group B” species which is a species with a higher sensitivity to disturbance.

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The modelled area for brown trout is on the neighbour's land title and considering the afforestation project is not within 100m of the stream itself and that its proposed spawning location is modelled, it would be very unlikely for any adverse effects on this introduced species.

Canterbury Mudfish have been located upstream of the proposed afforestation area. This should be considered in any consent application as there are very limited waterways this species is present in South Canterbury. As our project does not plan to disturb the habitat or degrade the habitat it would be very unlikely that there would be any major disruption to the spawning grounds.

- d. If there are sensitive environments such as fish spawning grounds or habitats of indigenous fish fauna occurring within or adjacent to the proposed development area, please provide an assessment detailing likely impacts of the proposed developments on such ecological values and how the applicant avoid/ minimise those impacts.

A major issue that may disrupt fish habitat in the future could be sediment runoff. Sediment runoff decreases water quality which may disturb natural fish habitat and their spawning cycle. Sediment runoff would not be an issue with afforestation but an effect of this in the future would be harvesting. Harvesting would expose soil which would lead to increased surface runoff. This can be mitigated by implementing sediment control measures like cutoffs on tracks or creating filter zones before the stream. As the forest is not planted all the way to the stream there will be a filter effect across the flat paddocks prior to the stream. What will also act as a filter will be the native vegetation the owner has planted in the riparian areas around the stream. Implementing these measures in 30 years when

harvest would likely to occur sediment can be controlled. In the future the forest may never be harvested if carbon prices increase. This means the forest could continue to act as a natural filter over its lifetime by intercepting rain and slowing runoff, therefore, improving water quality.

A decrease in surface water runoff may occur as more trees are planted which may reduce stream water levels. The proposed planting area is 78.2ha which when compared to the total catchment size of 3,753ha give a change in land use of 2%. Such a small number would imply that afforesting this area will have a small effect of the water flow in the Taiko Stream. Considering the location of this proposal is at the end of the catchment before entering the Pareora River (and after the fish swapping habitat) it would contribute a small amount of water volume to the Taiko Stream in comparison to the headwaters.

- e. Please describe measures to be taken to ensure no loss of significant indigenous biodiversity or indigenous biodiversity values as a result of the proposal. Include a monitoring plan designed to detect presence/absence of adverse effects and how and detected adverse environmental effects will be addressed.

As the previous land use was pasture there should be no loss of indigenous biodiversity as it consisted of exotic grasses and gorse. Considering how far away from the stream the proposed activity is there would be no adverse effects from the activity on the waterway. Due to the mudfish being present there are regular surveys carried out by ecologists. These can be easily requested at ECAN, where traps are laid out over night to see population numbers. This data can be compiled if there were any issues with the project affecting the mudfish habitat.

- f. Is the applicant currently intending to harvest the forest after the given rotation period? If so, will it cause significant negative impacts on the adjoining waterways?

A major issue that comes from harvesting could be sediment runoff. Sediment runoff decreases water quality which may disturb natural fish habitat and their spawning cycle. Sediment runoff would not be an issue with afforestation but an effect of this in the future would be harvesting. Harvesting would expose soil which would lead to increase surface runoff. This can be mitigated by implementing sediment control measures like cutoffs on tracks or creating filter zones before the stream. The harvest method used can also reduce sediment runoff as less tracking or earthworks is required. As the forest is not planted all the way to the stream there will be a filter effect across the flat paddocks prior to the stream. What will also act as a filter will be the native vegetation the owner has planted in the riparian areas around the stream. Implementing these measures in 30 years when harvest would likely to occur sediment can be controlled.

Slash management is another issue associated with harvesting. If done incorrectly it can slip down the hill into the stream. The NES-PF has strict rules we must comply with relating to slash management. This includes areas where it can be safely stored, benching around the edges, or spreading it out after harvest to reduce the weight. Due to the location of these sites this can be easily managed.

Another thought is in the future the forest may never be harvested if carbon prices increase and it is more lucrative than harvesting.