

Section 10.5: Sequestering more carbon in forests.

I support the direction identified and with reference to the call for further investigation make the following points¹:

- A clear distinction should be made between plantation forests for production and for carbon sequestration purposes.
- Native forests have a slower but more sustained uptake of carbon and are likely to reach close to a steady state at maturity with losses from the death, collapse, and decay of trees offset by (and giving rise) to new growth;
- Plantation forests have a more rapid carbon uptake. However, this is offset by management practices required to sustain wood quality and control pests; by harvest, transport, and processing impacts; and by the decay of on-site waste arising from harvest.
- Minimising these costs requires that plantation forests are planted on accessible, sites of moderate (not steep) topography, with reasonably high levels of fertility (Class 3 to 4 LUC) to facilitate management and production of logs that support a high yield of construction timber, rather than favouring energy intensive pulp-based products. The greater the waste (the lower the yield in timber products, including framing and cladding), the less amount of carbon stored.
- The disbenefits and risks associated with opting for more remote sites with steeper slopes and lower fertility for production forestry include:
 - Greater loss of biomass and release of carbon from tree fall from land instability or root exposure;
 - The concentration of pest species (flora – including wilding pines -- and fauna) creating a hearth to support invasion of adjoining or nearby lands;
 - Greater costs, lower yields and lower returns make harvesting subject to cyclical prices and, potentially, long-term price falls. This means trees may be left standing beyond maturity, increasing the prospect for increased under-tree debris, tree collapse and wind-throw, disease, and fire, all of which release carbon.
- Of particular concern given an apparently increasing frequency of high impact storms is the increased risk that the 20-30 years of sediment retained during the growing cycle will be released from plantation forests at and for some time after clear felling. (Selective felling that might reduce this risk felling is unlikely to be economic on difficult sites). The occasional large-scale release of sediment (and forest debris) by storm occurrence can be catastrophic for lowland agriculture and water quality and terrestrial and aquatic productivity.
- The generic risks of fire and disease releasing carbon in a monoculture can be reduced with a sensible land use pattern that favours sound and regular management and monitoring, robust, accessible stands of radiata or other plantation forest crops.

¹ Based in large part on occasional experience (1980s to 2000s) in economic (covering the entire lifecycle of radiata forests and processing paths) and ecological modelling of plantation forests in the central North Island; transport impact modelling of for the forestry sector; assessment of farm-forestry; visual inspection of the impact of Cyclone Boal on East Cape forests and catchments; and comparison of carbon sequestration rates based on secondary data.

- The diversity of native forests, the slower progress towards maturity, and the adaptation of species and complexes to site conditions offers a more balanced and generally sustainable path to carbon capture and retention. This includes carbon capture throughout regeneration, moving from bracken/scrub, through nursery species (manuka) to semi-mature and mature forests, with a far greater prospect of carbon storage in the undercover than in a monoculture.
- The carbon capture and retention benefits, coupled with productivity benefits to lower hill country, river plains, and coastal country activities, may justify intervention to encourage managed reversion on appropriate sites, including riparian strips. Management techniques include fencing, eliminating pests (stoats, rats, hedgehogs to lift bird-life and the seeding role birds movement; and goats to protect vegetation; invasive plant species, including wilding pines), and selective planting.²
- With the commitment to tree planting as part of the regional development policy initiatives of the Government, it is important that these distinctions are retained in land use decisions so that the productivity benefits of both plantation and native forestry are recognised and as far as possible maximised.

² It is likely that the withdrawal of Land Development Encouragement Loans and Livestock Incentive Schemes yielded a productivity and carbon sequestration benefit in the early 1980s as farmers withdrew from lands that were non-economic (and commercially unviable without subsidy).