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# Forest ecosystem services

People benefit from services provided by forest ecosystems.

People talk about four different types of benefits:

1. Financial services from timber, fuel and fibre for example.
2. Regulating services, such as carbon capture and storage, avoided erosion, water regulation and providing habitats.
3. Social services, including cultural, spiritual, health, recreation and biodiversity benefits
4. Supporting services, including the natural processes that help provide the other services.

Spider orchid *Corybas oblongus*

Services that have a dollar value, such as wood and carbon sequestration, are easy to account for when making policy and land management decisions. The value of other services, such as erosion prevention, biodiversity and recreation, are more difficult to quantify. While their value is not well established, they can be "worth" more to people and the environment than timber alone.

We need to consider the true value of our forests when making land use decisions that benefit both landowners and wider society. This includes ecosystem services with and without a dollar value.

## The benefits of trees on farms

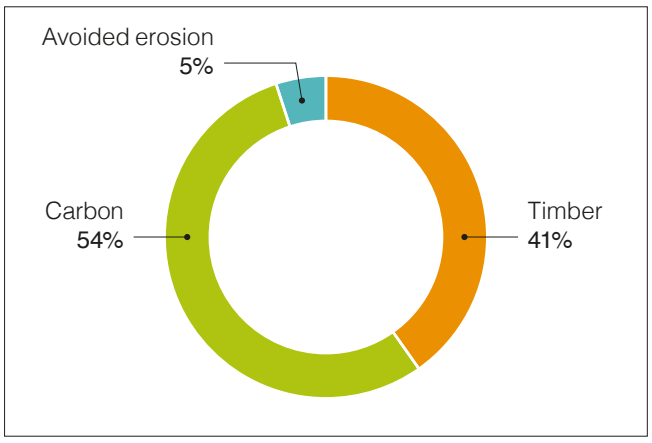
Hawke's Bay landowners mentioned the following benefits of trees on farms in a recent survey:

- Financial (cashflow and long-term investment) and land use optimisation.
- Animal welfare (shade, shelter and feed), aesthetics, social licence and improved mental health.
- Increased productivity was also reported by most.

## Valuing ecosystem services in the Wenita forest estate

The 29,000 ha Wenita planted forest estate in Otago is predominantly planted in radiata pine. Non-production areas (~25% of the land) consist of naturally regenerating mānuka and other native bush.

An ecosystem services analysis has shown that the contributions of carbon sequestration and avoided erosion to the total value of the forest is greater than that of timber alone. This information has helped Wenita renew their product certification under the Forest Stewardship Council.




## Ecosystem services resources

A series of environmental fact sheets has been developed by Scion and the New Zealand Forest Owners Association. Some of these are summarised below. The full versions can be found at: *www.nzfoa.org.nz/resources/file-libraries-resources/environment/factsheets*

## Forest water quality and dynamics

New Zealand's forests provide sustainable sources of high quality water. The country's 1.7 million hectares of planted forests contain an estimated 24,220 km of streams. For most of the forest growing cycle, the water quality and the aquatic habitats are very similar to those in indigenous forest.

Forested catchments have the potential to supply water during the spring and summer and regulate stream flow during storm events. Water use research shows that even in the driest parts of New Zealand, there is still available water in catchments planted in radiata pine.

## Debris flows

Landslides and debris flows are natural processes in all New Zealand forests. Strategies such as targeted riparian zone management, retiring areas recognised as having a very high risk of debris flows into permanent forest, maintaining wider buffer zones and rapid replanting help minimise debris flows and their impacts.

The response and recovery of a riparian and stream ecosystem after harvesting, extreme rainfall and an unexpected debris flow has been monitored. Five years post-flow, the invertebrate community in the stream was similar to that before harvest. Some fish species had thrived but others were rare or absent, showing that recovery is a dynamic process. Protecting riparian vegetation and the reintroduction of large stable pieces of wood into the stream helped the recovery process.

## Biodiversity in planted forests

The mix of exotic trees and native ecosystem remnants that make up New Zealand planted forests are home to many species, including kiwi, falcons, bats and at least 120 other threatened indigenous species. Planted forests can function as a haven for some species in landscapes where they are often the only forest habitat. Planted forests are also parts of corridors that help species move between otherwise isolated native forest patches and other habitats.

## Planted forests and carbon

Sustainably grown trees capture carbon dioxide from the atmosphere to grow and the carbon is stored in the forest biomass. Wood products and buildings continue to store carbon for their lifetime. Overall, forestry is a net benefit to New Zealand's emissions profile.

## Further references and reading


*https://www.nzffa.org.nz/farm-forestry-model/why-farm-forestry/trees-for-ecosystem-services/*

*https://www.landcareresearch.co.nz/publications/ecosystem-services-in-new-zealand/*

*https://www.scionresearch.com/science/sustainable-forest-and-land-management/valuing-the-forest-ecosystem*

*https://www.scionresearch.com/science/sustainable-forest-and-land-management/creating-thriving-environments*


## Contact information


**Scion**
Email publications@scionresearch.com
Telephone +64 7 343 5899
Website www.scionresearch.com


## About Scion

Scion is the Crown research institute that specialises in research, science and technology development for the forestry, wood and wood-derived materials and other bio-material sectors.

Scion's purpose is to create economic value across the entire value forestry chain, and contribute to beneficial environmental and social outcomes for New Zealand.

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Te Papa Tipu Innovation Park,
Tītokorangi Drive, Rotorua
Private Bag 3020, Rotorua 3046,
New Zealand


**Prosperity from trees** *Mai i te ngahere oranga*


June 2021