

Sowing the Seeds of Success in Native Forest Restoration After Fire

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Introducing the Project

- 4 year project with Tasman District Council, Te Uru Rākau and Tasman Pine Forests Ltd.
- Pigeon Valley fire and Teapot Valley
- Project activities
- **Natural regeneration**
- **Direct seeding**



Pigeon Valley Fire

- February 2019
- ~2,400 ha burnt
- Third-largest known wildfire at the time
- Plantation forests, native forests, pasture
- Teapot Valley: 60 ha of native forest



ABLAZE


THE 2019 TASMAN FIRES

In 2019 wildfire tore through the Tasman rohe (region). It began on 5 February and burned for 22 days.

Pine plantations, native forest, grasslands, and pasture succumbed. Flames towered above homes. Livestock, native animals, and pets were at risk, as were people.

One of New Zealand's worst wildfires was sparked simply by a tractor 'discing' a paddock. But another spark was also created, that of community spirit. People opened their homes to evacuees, donations of essential supplies poured into relief centres, and what seemed like a region-wide kitchen kicked into gear.

This selfless commitment to help and support characterised the Nelson Tasman spirit in this time of great need.



Teapot Valley

- High quality remnant of rare lowland alluvial beech-podocarp forest: not burnt
- Riparian and wetlands areas: not burnt
- Hillslope beech (podocarp) forest: burnt



Monitoring Vegetation Communities

2021 and 2024

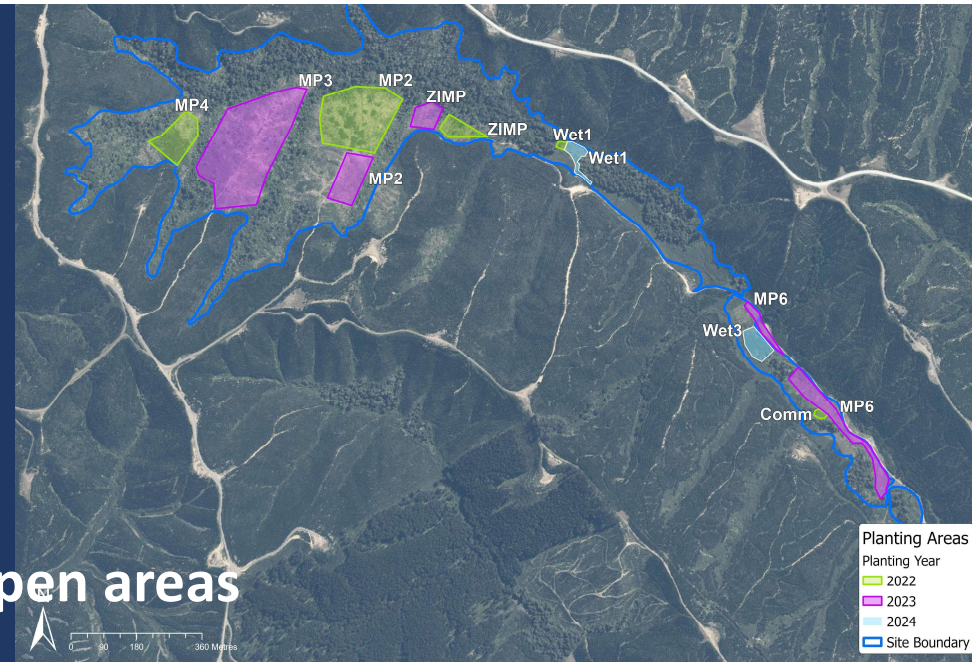
- Baseline and after 3 years of restoration work
- Transects and quadrats to assess:
 - mid-storey cover
 - understorey cover
 - recruitment of woody species
- Native and exotic vegetation
- In intact forest, forest edges and open areas
- Part 1 of 2025 Final Report



Planting

2022 - 2024

- 33,192 native plants, 11 ha
- 51 species
- Pioneer shrubs (trees) in burnt and open areas
- Increased diversity on edges and in-filling remnants
- Wetlands – graminoids, trees, shrubs
- Survival, health and growth data in Part 3 of 2025 Final Report



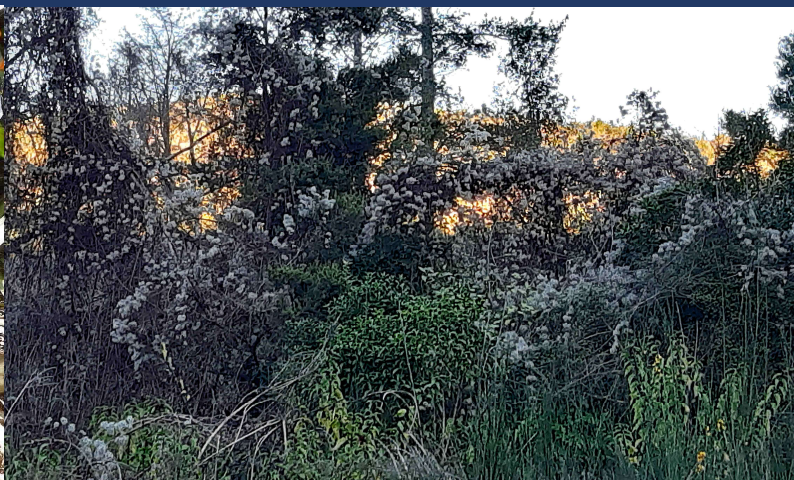
Planting – Making Connections

- Decreasing fragmentation, increasing connectivity
- Increase resilience (increase area: edge ratio)
- Intact to burnt areas
- Existing fragments
- Wetlands to intact forest



Weeds and Pests

- Controlled: old man's beard, pampas, Tasmanian blackwoods, willows
- Also: blackberry, broom, gorse, **Himalayan honeysuckle**
- Limited: possum, stoat, wasp control
- Ongoing: **pig** control





Natural Regeneration after Fire

Fire and Native Forests

- Rare event - limited natural ignition sources
- Native forest species not adapted to fire
- As climate warms, risk of wildfires increases
- Teapot Valley provided an ideal opportunity to study post-fire regeneration
- **Caveat:** one site, one fire event, one point in time, surrounding intact forest



Natural Regeneration

Field Trial

- 48 paired subplots, each 5 x 10 m
- Counted all native woody recruits in Feb 2023 (4 years post-fire)
- Removed woody weeds from 1 of each pair
- Gorse and Himalayan honeysuckle
- Reassessed in Feb 2025
- Does woody weed removal promote natural regeneration of native **woody** spp?



Natural Regeneration

Findings

- Weeding treatment had **no** impact
- Cover of exotic grasses (and herbs) detrimental
- **2023: ~3,000** recruits, **34** spp
- **2025: ~8,000** recruits, **44** spp



Natural Regeneration

Abundant Species

- Māhoe (2023), karamū (2025)
- Coprosma spp., kānuka, makomako, putaputawētā, tall mingimingi
- Black and hard beech, silver fern/ponga
- Tree ferns creating ‘islands of regeneration’: protecting and supporting range of other native species (act as stepping stones)
- Native herbaceous species also regenerating



Natural Regeneration

Key Messages

- Natural regeneration can happen after fire with native species
- May need to interplant to restore diversity
- Surrounding forest: seed sources, birds, perches, microbial communities
- Full results in Part 2 of 2025 Final Report



Direct Seeding

- Applying agricultural techniques to native revegetation
- Can hand sow, use machinery or drones
- Why do it? Cheaper, but riskier
- Can be large or small scale
- Probably only suitable for small suite of species
- Pioneer spp
- Get revegetation underway, and then interplant or regenerate naturally
- **Caveat:** our trials were revegetating previously forested areas



Direct Seeding

Field Trials

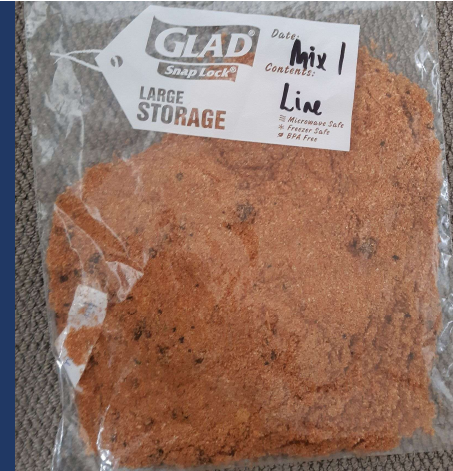
- Cleared plots to create vegetation-free areas
- Created furrows with hand tools prior to sowing
- Hand sowed in spring 2023 and spring 2024
- After sowing, use rake to tamp down seed mix
- Hand-weeded lines at 3 months post-sowing
- Assessed at 3, 6, 12 and 18 months



Direct Seeding

Field Trials

- 2023: 2 seed mixes, 12 spp, hillslope plots
- 2024: 1 seed mix, 6 spp, riparian and hillslope plots
- **Seed tested** in nursery for viability
- **Sowed 1.0 – 1.7 g seed/fruit mix per metre**
- Seed mixed with sawdust as a carrier for sowing
- **Control:** only sawdust sown (background recruitment)
- **Control:** some lines not weeded in 2024





Direct Seeding

Results

- **2023 trial:** 6 months – **240** seedlings; 18 months – **360**
- **2024 trial:** 6 months – **~1,970** seedlings: **RAIN!**
- **Karamū, mānuka, tī kōuka/cabbage tree**
- Few tōtara, wineberry, kānuka
- Tallest 2023 plant is **80 cm mānuka**
- Weeding: improved growth but not seedling numbers
- If soil moisture limiting, weeding probably needed
- Can take 12+ months to get germination



Direct Seeding

Key Messages

- **Proof of concept: it's possible to successfully direct seed native species**
- **Can kick-start restoration, will need to augment with additional species to restore full diversity**
- **Need more data/info on spp, seed rates, seasons, techniques etc**
- **Do try this at home!**
- **Keep good records and share data**
- **Full results in Part 4 of 2025 Final Report plus a Fact Sheet with tips and tricks**

Resources

Monitoring Reports and Fact Sheets

- Annual reports, including 5 final report components
- Tasman District Council website, search teapot
- <https://www.tasman.govt.nz/my-council/projects/economic-recovery-projects/jobs-for-nature/teapot-valley-restoration-project-updates>
- edeecologic@gmail.com



THANK YOU