TE KAAHU O TUAWHENUA

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THE TRUST'S GOAL IS TO **"RESTORE THE FOREST NEAR ENOUGH TO WHAT IT WAS LIKE BEFORE IT WAS LOGGED. WE CERTAINLY NEED WAYS TO GENERATE INCOME FOR OUR PEOPLE IN THIS REGION BUT WE ALSO WANT TO IMPROVE THE OVERALL HEALTH OF THE FOREST AND HELP WITH THE REGENERATION OF OTHER SPECIES."** (TAHAE DOHERTY 2009 COMMENTS ON PODOCARP RESTORATION ON TUAWHENUA LANDS).

The MAF Sustainable Farming Fund project will plant 4000 rimu seedlings on Tuawhenua lands.

TUAWHENUA TRUST AND MAF SUSTAINABLE FARMING FUND PROJECT

The Tuawhenua Trust is charged with the responsibility of retaining ownership and providing the overall kaitiaki responsibility of the land vested in the Trust.

OVERARCHING GOALS OF THE TUAWHENUA TRUST:

- Be the centre of knowledge for the management of Urewera lands and forests
- Ensure the protection and restoration of the Tuawhenua bushlands
- Pursue economic development for the benefit of current and future generations without compromising our conservation principles

GOALS FOR NGAHERE O TE TUAWHENUA IN 50 YEARS:

- Native forest still standing and healthy
- Podocarps (toromīro, rimū, kahikā, tōtara, mataī) regenerated
- Possum populations really low or all gone
- Native birdlife is flourishing with traditional harvests sustainable
- Only some pig and deer (to feed us)
- Few or no weeds
- Forest to feed us not just to look at

WHAT THE TRUST HOPES TO ACHIEVE THROUGH THE SUSTAINABLE FARMING FUND (SFF) PODOCARP RESTORATION PROJECT:

Partners:

1) Manaaki Whenua
2) Te Wharekura o Huiarau
3) Scion
4) Ministry of Social Development
5) Waituhi(Ngati Tawhaki)
6) Te Hiwi o Te Wera (Ngati Manunui)
7) Okete-to be confirmed (Kuri Kino, Ngai Te Riu)
8) Apitihana-to be confirmed (Te Urewera)

The restoration project offers Ruatāhuna the opportunity to develop strategies around the preservation of the Trust forests and lands. It is also envisaged that educational and employment opportunities will be developed for the beneficiaries. While economic development is a priority for the Ruatāhuna community, the Trust is working to ensure that the regeneration of our ecosystems are in place before seeking economic gains for the beneficiaries and the Ruatāhuna community.

Trustees	Tahae Doherty (Chair)	Tane Rua	Anthony Te Kurapa	Hekenoa Te Kurapa	Brenda Tahi
Project Coordinator	Doris Rurehe				

FORESTS OF LIFE

ABOUT FORESTS OF LIFE

Forests of Life is an education programme run by Scion Research in collaboration with the Ministry of Education. It is an inquiry-based programme which means that students follow their own interests and either collectively, or individually, undertake their own science research. Schools therefore adapt the Forest of Life programme to their own needs and local situation. The programme offers the opportunity for schools and students to share their experiences and learning via the internet.

HOW DO WE GET INVOLVED WITH FORESTS OF LIFE?

Doris Rurehe has already been in contact with the people at Scion who run Forests of Life. They are interested in forming a partnership with Te Wharekura o Huiarau and, if the funding comes through, they will visit the school and discuss how the programme might work and be tailored to fit the needs of the school and wider community.

FOR FURTHER INFORMATION ABOUT THE FORESTS OF LIFE PROGRAMME:

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FOREST RESTORATION ON TUAWHENUA LANDS

The Tuawhenua Trust would like to see podocarp trees (toromīro, rimū, kahikā, tōtara, mataī) in the forest restored to the number present before logging last century. Since it is not possible to plant all the lands in the right mix of these species and then tend them to maturity we need to work with nature as much as possible. Here, we look at what we already know about podocarp regeneration in these types of forests and at which points in the life cycle we can try and tip the balance in favour of these forest giants.

Natural dynamics of tawa-podocarp forests

In most North Island tawā-podocarp forests tawa has been increasing in dominance during the last 100 years. This seems to be a natural process, in part, because tawā can regenerate in its own shade. Very large disturbances (like volcanic eruptions!) favour the podocarps, particularly the species that seem to need more light e.g., tōtara, kahikā, rimū. However, parent trees can live for a long time (hundreds of years) and seedlings of many species can survive in the shade of other trees for at least eighty years. This means that podocarps can hang on until the conditions are right for their growth.

The effects of logging on Tuawhenua forests

Given the right conditions logging can favour rimū regeneration. However, on Tuawhenua lands extensive logging of the podocarps appears to have helped tawā to become even more dominant (Figures 1 & 2).

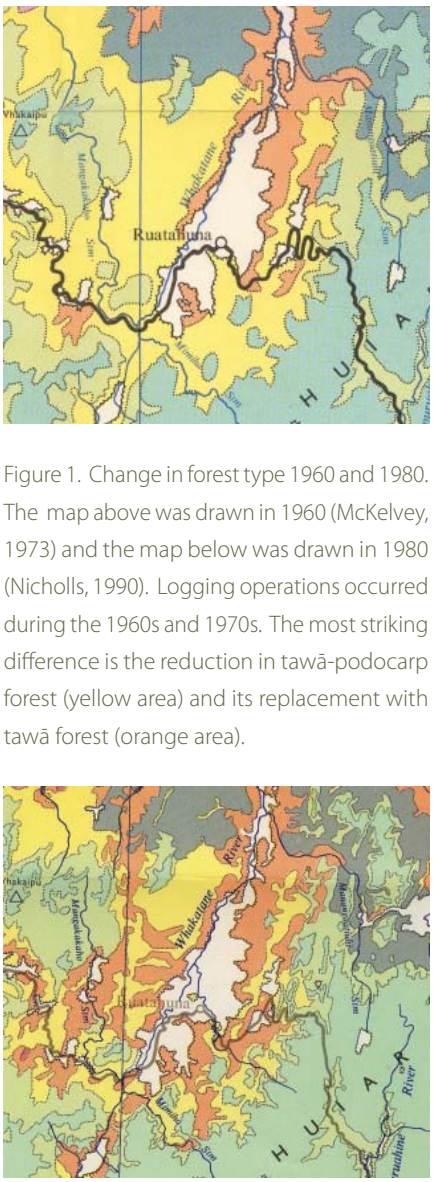

Figure 1. Change in forest type 1960 and 1980. The map above was drawn in 1960 (McKelvey, 1973) and the map below was drawn in 1980 (Nicholls, 1990). Logging operations occurred during the 1960s and 1970s. The most striking difference is the reduction in tawā-podocarp forest (yellow area) and its replacement with tawā forest (orange area).

The most important effect of logging has been the widespread removal of very large podocarp trees. Very large trees occupy lots of trunk area and the amount of this removed can be seen in Figure 2 where we show the change in trunk area with logging. All podocarp trunk areas decreased while tawā trunk area increased.

How much regeneration is there now in logged forests?

We estimate that before logging there were about 18 stems of tall podocarp trees (across all the species) per hectare. Using average death rates for these trees and current numbers of seedlings we estimate that there are not enough seedlings to regenerate the forest to the previous number of tall trees. Even if there are now more podocarp seedlings in the logged forest compared with the unlogged forest we estimate that most of the seedlings have come from parent trees that have since been removed by logging. Also, any gaps created by logging are about to disappear so it's unclear whether existing seedlings/saplings in logged forest will make it to the canopy, particularly for rimū. We expect there to be a lot more tawa trees in this type of forest than podocarp trees but we still think that the current number of podocarp seedlings is very low.

We think that some planting of seedlings would be useful, particularly if these could grow into trees that would provide more seed for the rest of the Tuawhenua lands. Given that rimu naturally regenerates before some of the other species and that stock is more readily available we think planting rimu would be a good start to restoration. Under optimal conditions rimu can seed in as little as 20 years. Rimu is eaten by kererū and once it is well established toromīro also comes in and acts as a kererū food source.

Where do podocarp seedlings regenerate naturally?

Naturally regenerating podocarp seedlings are more commonly found near ridges, away from gullies and tree ferns. The soils where they regenerate are often quite high in nitrogen but low in soil phosphorus. Rimū grows best when it has a lot of light overhead but is still sheltered from the side. It can grow faster than tawā in the light and it seems to naturally regenerate after disturbance before toromīro which might only reach its peak abundance at least 200 years after rimū!

Increasing the amount of nutrients available to seedlings benefits rimū and toromīro but also tawā**.**

Planting seedlings

Evidence from Forest Service trials suggests that planting larger seedlings gives better survival and growth rates. Larger seedlings (> 1 m) have been reported to grow up to three times faster than smaller plants. Given the current scarcity of nursery-raised seedlings an acceptable compromise is probably seedlings of c. 50 cm.

We need to think about the best place to plant rimū seedlings. Ideally it would be a place that was protected from domestic stock, particularly cattle, and accessible by 4WD so that we can transport people and seedlings to the site. We also want the school to be able to visit the site easily.

We will be looking for lots of ridges to plant seedlings on and we would ideally like the tawā canopy to be naturally open – maybe from snow damage? It would be good to consider also whether a few tawā trees could be removed to create bigger canopy gaps that would give the seedlings the best chance of fast growth while they develop into trees. Data from the Forest Service trials suggests that gaps of 3–4 m diameter are necessary where the surrounding vegetation is 6 m high, and naturally gaps should be correspondingly larger where the canopy is higher. It also has been suggested that weeding should occur around seedlings periodically to help achieve maximum rates of growth and survival.

We would like to see whether the rimū seedlings grow better under kānuka trees or under tawā trees. Therefore some seedlings will be planted in the tawā forest and some will be planted in the kānuka forest.

We need to provide the right conditions for the fungi that grow in rimū roots and help the tree to extract nutrients from the soil. This can be done by selecting warm sites that are not too acidic and by placing forest soil in planting holes with seedlings.

At the time of planting we might cut a trench around rimū seedlings to reduce tawā root growth near to the seedlings – this would mean more water and nutrients left for the rimū. This seems particularly important for rimū trees growing in the light.

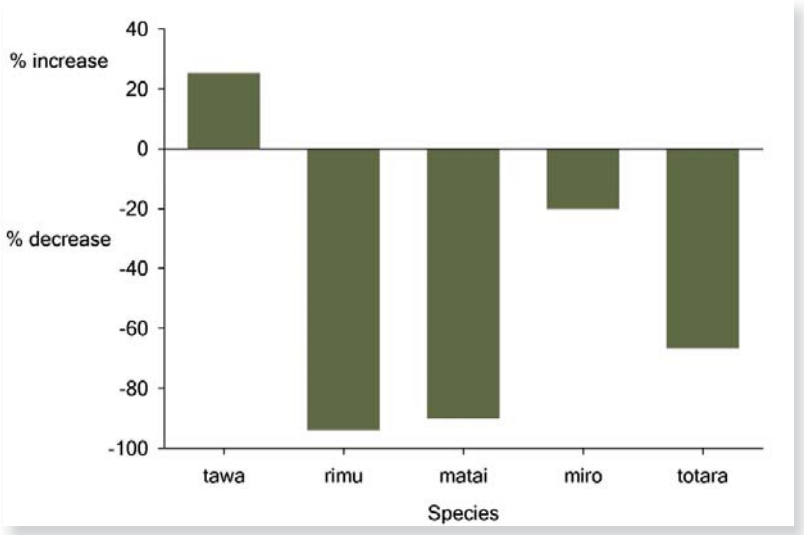

Figure 2. Summary of change in trunk area between logged and unlogged stands of forests on Tuawhenua lands, by species.

Extra reading:

McKelvey PJ 1973. The pattern of the Urewera forests. New Zealand Forest Service Technical Paper 59.

Nicholls JL 1990. Urewera. Forest Service Mapping Series 6.

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