Waikereru Seed Islands Progress Report

December 2023

Prepared by Ecoworks NZ Ltd.

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On the 20th of December 2023, the third Seed Island assessment for 2023 was conducted by Ecoworks NZ. This update provides information which helps us to understand both the short- and long-term progress and outcomes of this experimental planting regime. These regular checks also enable any browsing and predation on the plants to be identified and managed quickly.

In December, all 31 Seed Islands were assessed, and notes were taken on progress.

Results

Generally, the seedlings have been doing well since planting in 2022 and 2023. Some damage due to various factors was noted, this information can be found in Table 1. Where particular species were identified as doing significantly well, this was also noted (Table 1). These observations are useful for determining which species to plant in future regeneration plantings at Waikereru and further afield in Tairāwhiti.

Table 1. Progress notes for Seed Islands 1-31, inspection date: December 2023.

Island number	Notes
1	Plants are c.1 metre in height. The makomako and tītoki have damage from mānuka beetle (Fig. 1). One houhere has been snapped in half and browsed, as has one kohekohe, though damage looks old.
2	Plants are growing well here, some of the smaller plants will require release spraying though most plants are tall enough to cope with grass growth now.
3	Plants are all thriving.
4	One karamū has died. All other plants are showing signs of new growth.
5	Plants are growing well here; light grass sward. There is a small amount of browsing evidence, but this appears to be old.
6	Some light browsing but not significant.
7	Minimal evidence of previous browsing. The ngaio is doing very well here.
8	Plants are all looking healthy and have lots of new growth.
9	The plants here all have new growth. The rātā appear to do well at this site. Makomako plants have evidence of previous possum browsing.
10	Plants are all in good condition, there is some evidence of old browsing. The pūriri growing rapidly with one plant >2.0 m in height after 18 months in the ground (Fig. 2).

11	Most of the plants here are over one metre, which is very good progress. The makomako is doing notably well (Fig. 3). The grass sward surrounding this plot is dense however the plants do not appear to be impacted by this.
12	The plants here are all putting on new growth, the pūriri are over one metre in height after only six months in the ground. There is insect damage to the tītoki.
13	Plants are all looking healthy here.
14	The ngaio and pūriri here are doing especially well, though all plants are growing well and are above the grass height.
15	Plants are all looking healthy.
16	The rewarewa is not going well here, one has died, and another is sick. The pūriri, ngaio and kahikatea have considerable new growth. There is some old browsing evidence on a few plants, but they are all recovering well.
17	Lots of old browsing evidence but plants are all putting on new growth. Rewarewa is not looking very healthy, the leaves are going brown.
18	The plants all look good. One plant is missing from the plot.
19	Makomako has previously had some severe browsing pressure and currently displays signs of insect damage. All the other plants look good.
20	Ngaio, rewarewa, pūriri and tōtara are all thriving in this plot. The other species appear to be struggling with grass competition. There is some old browsing evidence on makomako, notably, as well as on some of the other plant species.
21	Plants all have new growth. Karamu has suffered from severe browsing previously but is recovering slowly.
22	Plants look good. Kawakawa, putaputawētā and tītoki seedlings developing (Fig. 4).
23	All makomako has evidence of past severe browsing, however it is recovering slowly.
24	Karamu has been browsed. Lots of kawakawa seedlings are popping up.
25	Several plants are unidentifiable due to being browsed down to the small trunk. Most of these plants appear to still be alive and will hopefully recover. Two rewarewa have died.
26	Browsing has occurred on more palatable species; goat sign was noted nearby. Most plants are putting on new growth.

27	Most plants are growing well despite browsing. Fresh animal scat was noted nearby.
28	Plants are growing but appears slower than in other plots. More palatable species have been browsed previously but are regrowing.
29	Plants are all looking good except for one that has died.
30	Plants are all doing well here, other native seedlings are developing within the plot.
31	Most plants are looking good and growing well.

Figure 1. Mānuka beetle damage to tītoki.

Figure 2. Pūriri are growing well; some are over two-metres tall.

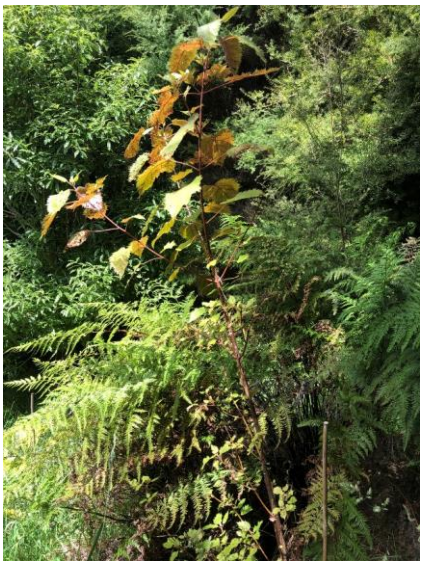

Figure 3. Makomako is getting tall in some plots.

Figure 4. Kawakawa, putaputawētā and tītoki seedlings popping up around island 22.

Incursion of weeds

There have been some issues with grass and invasive species encroaching on the seed islands which could impact the survival of seedlings. Releasing through hand clearing and release spraying has been carried out by Ecoworks staff when required. The spraying of weed species has also been conducted by Ecoworks staff to mitigate negative impacts on the seedlings. This was carried out following discussions with Michael Bergin (Trees That Count, Technical Advisor) in September 2023. Table 2 contains notes taken on the progress of weed control and incursion for each island.

Commented [GH1]: I think this sections needs a bit of a re-word. Some weeds have been sprayed, mostly blackberry. But the majority of the spraying was release spraying the plants from the grass which isn't really considered a weed species. Happy to help work this out.

Commented [EN2R1]: Add in any bullet points if you want more info :o)

Commented [GH3R1]: Looks great, thank you.

Table 2. Island-specific notes on any issues with weeds or smothering at the Seed Islands, notes taken during the assessment in December 2023.

Island number	Status
1	Ragwort and Mexican daisy. Blackberry patch above has been controlled, but thistles, ragwort and fleabane are coming through from underneath.
2	No issues.
3	This plot is almost completely covered in Mexican daisy. Does not appear to be impacting the growth of the trees here.
4	No issues.
5	No issues.
6	Need grass and Mexican daisy sprayed.
7	Need Mexican daisy and blackberry sprayed.
8	Mexican daisy needs spraying, blackberry seedlings coming through.
9	No issues.
10	Small patch of Mexican daisy
11	No issues.
12	No issues.
13	Inkweed and blackberry seedlings are popping up nearby.
14	Some Mexican daisy encroaching on plot.
15	No issues.
16	Mexican daisy beginning to encroach further on this plot. Grass is not currently an issue.
17	No issues.
18	No issues.
19	Grass not currently an issue.
20	No issues.
21	Release spraying is holding well.
22	No issues.
23	Small amounts of Mexican daisy.
24	Blackberry and Mexican daisy starting to encroach on plot.
25	Spray releasing has held weeds back well at this stage.
26	Spray release holding.

27	Needs another hand and spray release to support plants. The blackberry patch above this plot has mostly died with just a few strands beginning to encroach on the plot; could be cut and pasted.
28	No issues.
29	Blackberry seedlings popping up below plot.
30	No issues.
31	No issues.

Further weed control and releasing identified in this assessment will be carried out in early 2024, as discussed with Michael Bergin.

Discussion

The Seed Islands are performing well with new growth and healthy plants observed. Several of the plants have suffered from browsing, however these plants are generally making a recovery which is great to see. The species tending to do the best in this environment include pūriri and ngaio, though tōtara and rātā have also been doing notably well in some of the islands. Tītoki and rewarewa seem to be most susceptible to disease, stress and/or insect predation, while makomako, kōwhai and karamu are highly palatable species for browsers. At other sites we find makomako (wineberry) is a favourite winter feed species for possums.

The monitoring and control of browsers and weed species within and around the Seed Islands, remains important as these young trees are still vulnerable.

The 'seed island' project has been highly successful to date, with excellent growth rates for all plots within this sheltered kanuka dominated forest. The plots are relatively easy to monitor and maintain and plots should begin to provide seed material within a short time frame based on current growth rates.

As we have experienced at multiple sites throughout Tairawhiti developing indigenous forest is highly successful if it is partnered with effective pest control. This protects roosting and feeding birds; both native and introduced species, i.e. starling. If rodent, mustelid, cat and possum control is effective, bird species will comfortably roost onsite and at the same time distribute large volumes of seed material therefore completing the forest restoration job. If pest control is not set up or is poor, birds will roost at other locations. Even introduced starlings will

distribute species such as miro, matai, totara, kahikatea, kohekohe, putaputaweta and bush lawyer.

If you require further information regarding this survey, please contact Nicola Carter on 021 567 653 or nicola@ecoworks.co.nz.

Kind regards,

Emma Naylor & Nicola Carter

For

Steve Sawyer

Ecoworks NZ Ltd.