

Greetings Frances

Thank you for your guiding and introduction to Kohi Forest. I thought I'd jot down a few of the key values I saw, and things I think could and should be done to help restore and protect this strangled jewel so it can in turn reinvigorate and restore the surrounding area. Both land (particularly the young restoration at Whenua Rangitira/ Bastion Point), and hopefully eventually daylighted sections of the stream through Madill's Farm Reserve all the way to the sea.

The Kohi Forest has a special combination of ecological values, both aquatic and terrestrial that are uncommon in the area, where most of the land was at one time in pasture. It was exciting to have the lichen information – I am sure the moss flora will be also be diverse. People (even ecologists) seeing sites like Pamela Place often get distracted by the highly visible things – the canopy of privet, strangling jasmine/honeysuckle and smothering wandering willy/ginger and don't see the potential – and here the potential is enormous. The protocols and standards for identifying 'significance' are also heavily weighted to what is there now, and dominant plant species, as there isn't the resources to look at lichens, insects and soils – including whole parts of the ecosystems like soil mycorrhizae or biology/earthworms. The very sad thing is that so many neighbours of Kohi Forest have allowed the original puriri canopy to collapse and degrade over the last decades.

#### **Aquatic values**

- healthy populations of native fish (galaxids, bullies and eel), but also invertebrates. This is important because of its location in a relatively large headwater area with permanent flow even in summer. This means it can help repopulate downstream areas as these are daylighted/restored. Many streams in Auckland can't be properly restored because the headwaters have been removed (filled in and piped) and summer flows are reduced or too warm because of urban development
- most of the stream banks appeared stable - in much of Auckland streams are hugely compromised by massive erosion due to unstable banks from changed storm flows (and sewage overflows in some areas).
- there are large potential 'restorable' stream sections downstream in Magills Farm fields adds to its value. Kohi Forest encompasses the top of the catchment enables and 'releases' values downstream that are absent in most other areas (because in other areas headwaters have been removed, stormwater inflows,
- there are no blocks to fish passage so they can get to the forest from the sea (many other streams have blockages or barriers

There are RISKS to these aquatic values – spills can kill the stream life. This is most likely where any manhole overflows, or any stormwater/drainage pipe discharges directly to the stream. Our stream was killed three times in one year when the section 3 doors up was redeveloped into 2 houses – three different contractors - one by concrete and acid that contractors waterblasted off the new drive to expose aggregate, as is common practice); once by painters washing brushes and buckets into their stormwater drain, and over months from sediment during site earthworks. To reduce the risk it would be good to use Council maps to find stormwater drains, and walk up the stream to find any pipes/inlets. Ideally any direct discharges are cut and daylighted at the edge of the floodplain (where its stable) and into filtering wetlands. But this needs Council help. It may be safer/less damaging to disconnect back at the house/driveway/road by popping in a detention tank, raingarden or swale – then the overflow can go back in the pipe at the outlet. I would love to see what you've done with your swale/cabbage tree. The key is to get water running through plants and soil, as soil is an awesome filter and most pollutants

are not damaging to soil / plants. Education of neighbouring properties + contractors is key – and keeping a sharp eye out for any building activities in neighbouring houses. No-one should use copper or unpainted zinc guttering or roofing as it poisons stream life (but not plants). The Auckland Council Healthy Waters Team should be able to run workshops and demonstrations.

### Terrestrial values

- Kōhi Forest has the potential to generate a beneficial cascade of free native plants (especially ferns, kohekohe, totara, kawakawa, karamu, pittosporums, puriri, lichens), native birds and amazing invertebrates (like puriri moths). Most people aren't so keen on insects, but tolerate them because they want more fantails/piwakawaka, grey warbler/riroriro, morepork/rururu. It was great to see evidence that the natural dispersal processors are present (good on you for reducing rats and possums so the seeds are available for the native birds): we saw kohekohe, karaka (under mahoe), hangehange, cabbage tree, nikau and lots of other small native seedlings in areas where the wandering willy/Tradescantia, ginger and jasmine was being controlled.
- It sounds as though pest control by Eastern Songbirds is having an impact on bird populations. Keruru are really important along with the more numerous tui as the main dispersers of native plants. Unfortunately the birds are also effective spreaders of the weeds that are in the forest and also in the neighbouring sections: but other than small and large leafed privet, the new weed seedlings appeared to be outnumbered by native seedlings in many areas. The aim is to tip this balance towards good seedlings even further, by getting neighbours to replace weedy trees with native or non-weedy ones (Plant me instead is a great resource <https://www.weedbusters.org.nz/resources/plant-me-instead-booklets/>). someone locally has 'Queen of the night' and that, along with privet and non-native palms (Bangalow, Phoenix, Queen palms) would be high on my priority list to get help to knock out. Palms are expensive to remove because they are hard to mulch and have spikey leaves that damage people, and may be a candidate for local Board funding to subsidise removal

### Opportunities

Here are some off-the-cuff recommendations for key approaches

- You've been doing trapping, and seeing results, and awesome the Eastern Songbird is helping. It would be easier for them if there were some more formalised tracks and crossings to get to the traps so more people could service them safely (especially in the wet). Consider adding wasp baiting (if you have noticed German wasps around) and killing paper wasps (the ones with the dangly legs) – as this really helps soft-bodied insects like caterpillars survive so we have the marvellous moths
- Keep hammering the jasmine – what a wretchedly difficult job! and remove flowerheads of ginger and Queen of the night (both snap off really easily) – to stop them producing seeds, and give you some breathing space .. find the source of the latter. When removing ginger be really careful within 2 m of the stream – as we need to retain as much plant cover as possible for the fish. Maybe remove it only on one side at a time and wait to clear the other side until native seedlings are 1-2 m tall and overhanging the stream (sedges, with nikau and tree ferns are super right beside streams, and cabbage tree in brighter places – they all eventually form cosy places for fish)
- Keep working on new, small (10-20 m<sup>2</sup>) easily accessible areas where free native seedlings will regrow. Hand-removing wandering willy et al from these for 2-3 years should allow the native seedlings to become 0.5-1 m tall and form a solid subcanopy .. some of these places will be under the taller trees where birds perch
- To help boost recovery and resilience: Retain leaf litter and any fallen logs (that won't resprout – check willow) within parts of your small 'seedling nurseries', and at edges.. to help keep soils soft and moist and create places for invertebrates (like that impressive millepede

- do a full walkthrough every year with Council (or Forest & Bird weed person or I am happy to help) to make sure bad new weeds are identified and killed early before they spread – including neighbours gardens if you can arrange it. Auckland Council's Mary Stewart is fantastic and has an immense knowledge of weeds. They might help develop a 5 to 10 year plan to phase replacement of the privet and willow canopy that will still keep forest and stream cool

Please do minimal planting of nursery-raised seedlings. I'd avoid planting except a very few key species you don't have. Two that have great bird value that I didn't see are tree fuschia (which needs moisture in the floodplain) and taraire, but even better, encourage neighbours to plant taraire and native hedges like putaputaweta (I didn't see that either) and Coprosma as edges that also help feed birds, with lots of nikau to replace any bangalo or queen palm as they are important winter food for keruru .

Lastly – please note that lighting is generally bad – so no footpaths should be lit; especially no lights visible from the stream; and encourage neighbours to have directional lighting (and not blue LED) to minimise spill of light into the forest; the hedges will also help keep the bush dark.

All the best  
Robyn

*2021 PS I think the power of Kohi Forest is not the surviving trees themselves (albeit some impressive kohekohe), but the small things - lichens, ferns, fungi, epiphytes on the trees, invertebrates .. and the story of recovery from being smothered and unloved. Probably also its value as a stepping stone shown by Rosie for birds from the islands, and in future hopefully its role in inoculating the daylighted stream and wetlands by supplying the invertebrates that are hanging on in the forest. The forest trees themselves are relatively young (100-200 years old) but their ecosystem is ancient. Fully characterised fungi, flora and invertebrates will mean it can be used as a model to understand and overcome the gaps between 'remnant' and new ecosystems, and become an inoculation source for 'missing' fungi, plant and invertebrate components, as used for lichen by Ngati Whatua Orakei and*

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