Specialty Wood Products Research Partnership

MARLBOROUGH RESEARCH CENTRE
Te Rito Hiranga o Wairau

National forest owner survey and resource inventory of alternative species

Stage Two of Hawke's Bay Region pilot project: survey of small-scale woodlot owners

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Publication No: SWP-T133

Date: July 2021

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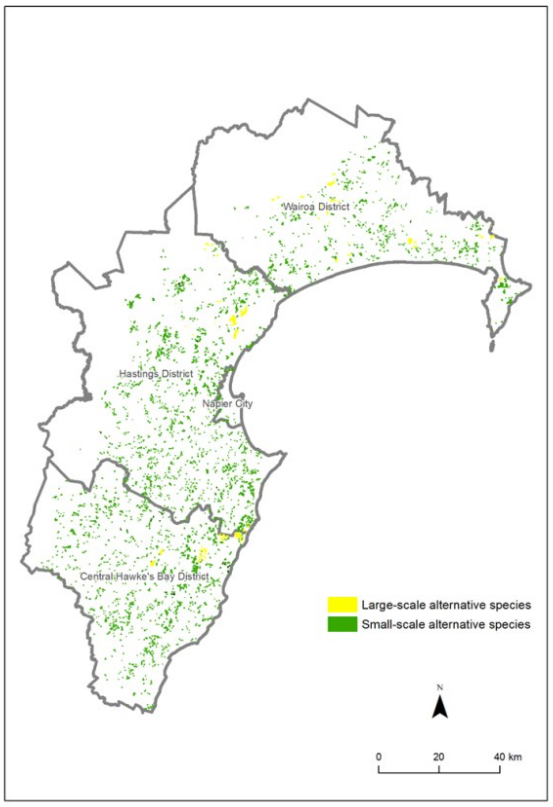
Objectives

The Stage 1 objective of this project was to identify a suitable methodology for a NZ-wide survey and inventory of alternative species forests and their owners by undertaking a pilot study in Hawke's Bay Region. This objective was achieved, mapping alternative species resource down to 0.1ha in the Hawke's Bay Region (Map 1), and identifying a significant proportion of the forest owners via application of the LINZ cadastral layer. The work confirmed that there are significant differences between NEFD data for alternative species in Hawke's Bay and the actual forest resource on the ground.



Map 1: Distribution of all alternative species forests over 0.1 ha in Hawke's Bay Region.

Stage 2a objectives were to validate and extend on small-scale owners' data gathered in Stage 1 and generate information about the Hawke's Bay alternative species resource which will be of value in future work to develop the small-scale sawmilling industry in the region. A survey of small-scale woodlot owners was believed to be the best way of obtaining more information about the alternative species resource and its possible future harvest.

Stage 2b objectives: work is to continue at the School of Forestry to develop a mapping approach to automatedly classify alternative species based on input data received from small-scale owners (Stage 2a) and corporate owners. This is a potentially highly valuable approach for an accurate national inventory of NZ's alternative species resource. The work, which we believe is a 'first' in New Zealand, has merit both as novel research as well as its potential for immediate application once developed. Dr Vega Xu will use a machine learning (ML) classification Random Forest (RF) to develop the mapping approach.

Stage 3 objectives: Pending the outcome of stage 2b a workplan will be prepared to rollout the algorithm, developed on the Hawkes Bay resource, nationally.

Stage 2a: Introduction

The National Exotic Forest Description (NEFD) is known to be inaccurate in its representation of small-scale forests, especially those comprising alternative (or 'specialty') species. In order to assess how these forests could contribute to regional economic development by supplying logs for small-scale domestic processing and markets, much more accurate information is needed on where these forests are, what species they comprise, the age and quality of the trees, their logging potential, and their owners' plans for future management including harvest and wood utilisation

Work in this project aligns closely with work underway to develop the small-scale sawmilling industry (SWP T106 and SWP WP153) as a means of invigorating regional demand for locally grown alternative timbers. The plan is for small-scale sawmillers and others in the alternative species timber value chain to have better knowledge of what forests and species are likely to come to market and to engage in long term contracts with the forest owners to supply logs so their business is sustainable.

Method and outcomes

Stage 1 of the project identified and mapped alternative species woodlots, and also identified the majority of landowners via the LINZ cadastral layer. By far the majority of the small-scale woodlots mapped were between 0.1ha – 1.0ha (1551 records, or some 66.5% of all records, but with a total area of only 613 ha, or 17% of the total small-scale resource). The total small-scale area mapped was 3566ha.

We opted to survey the owners of the 200 largest areas of woodlots. This included owners with more than one woodlot on their property. All woodlots were over 1 ha; the total area of woodlots belonging to owners who were surveyed was approximately 975 hectares (around 56% of the small-scale resource held in woodlots over 1 ha). It was anticipated that most of these owners would have some records and knowledge of their resource (e.g. maps and details of species and planting dates etc).

The original plan was to contact as many of these owners as possible by email and ask them to complete an on-line survey, providing details of their resource and future management plans, including plans for harvest. We secured the offer of help from the Hawke's Bay Farm Forestry Association in identifying the owners; the plan was that the HBFFA would assist with sending emails to their members who we had identified as the 'Top 200' owners.

However, this plan was thwarted as very few (less than 15) of our Top 200 owners turned out to be members of the Hawkes Bay FFA, or to be known to the HB FFA secretary.

This resulted in a change of plan. With the support of the FGR team at Rotorua, letters were sent to all woodlot owners instead, explaining the background and objectives of our project, and asking them to go online via a simple link, to complete the survey (Appendix 1). The letter was accompanied by some background information about the SWP.

Because of constraints over survey design using SurveyMonkey, there were in fact two slightly different surveys – one for owners of a single woodlot, and one for owners of multiple woodlots. The survey was designed to be easy to understand, and quick to complete (10 minutes). The survey was tested and deemed straightforward to complete.

Owners were provided with a unique identification number for each of their woodlots, and the mapped area of the woodlot. The ID number had to be entered at the start of the survey, enabling the project team to link the information entered about species etc to be linked to the woodlot in the mapping system.

In May 2021, letters were sent to approx 150 owners of single woodlots, and approx. 37 owners of multiple woodlots. The original plan had been to contact the 10 owners of four or more woodlots by phone, to explain the objectives of the survey and to encourage them to complete it. This was not followed up due to the survey costs having exceeded the funding contracted and that this information would make only a minor contribution given the very small number of responses by other woodlot owners.

Owners were given around two weeks to go on-line and complete the survey.

Survey outcomes

The survey outcomes were as follows:

- **Five survey responses** from single woodlot owners; only two growing trees for timber. One owner was growing *C. lusitanica* (p1994); the other had a mix of cypress and deodar cedar (planting dates varied from 1990s)
- One of these owners indicated that they would harvest the trees at the same time as an adjacent pine block and take whatever price was offered by the harvesting contractor; the other indicated the trees would be sold at target size and when a good off-farm market was available.
- Of the single woodlot owners **not** growing trees for timber**,** one was growing them for shelter and two were uncertain about the purpose of the trees.
- **Three valid survey** responses from multiple woodlot owners; one growing trees for timber, one for shelter, one uncertain.
- Two people contacted Harriet Palmer to ask for more information and were sent a map by Vega Xu; 2-3 contacted the FGR office and were helped by Veronica Bennett.
- A further phone call was received on 15.07.21 from an owner apologising for not completing the survey. He was growing a mix of alternative species for timber along with radiata, was very supportive of the project, and lamented not knowing how to find a good mobile sawmiller.
- Only ten letters were ‘returned to sender’ indicating that a large proportion of the letters were delivered.

Conclusions and discussion

The fact that many woodlot owners did not respond to the survey was probably in part due to the use of postal mail rather than email. Many recipients will have opened the letter and found it did not generate sufficient interest for them to then log on to complete the survey. Some letters may have not been opened.

However, the eight responses do provide an indicative look at the range of management approaches taken by landowners for their woodlots. This includes three who are growing trees for harvest; two for stock shelter and three uncertain about their value. Those that are uncertain will include those that may see the woodlots as part of the farm environment and landscape and not financially important, maybe just have no idea and are not interested. Some of those who did not respond to the survey are also likely to be in this category.

At this stage investing in a phone survey to contact the balance of the owners would produce more information about the woodlot owners’ plans for future management including harvest. But this would be a large (and costly) task and beyond the current scope of the SWP programme.

SWP WP153 proposes a more direct way to engage with those who own woodlots that they plan to harvest. This sets out a plan for FGR to work with local branches of NZ Farm Forestry Association to develop and facilitate a series of regional ‘NZ Specialty Wood Trade Shows’ as well as industry

workshops, the primary purpose of which would be to develop and strengthen connections between the current businesses that are part of existing regional alternative timbers supply chains.

The NZ Farm Forestry Association represents small-scale growers throughout New Zealand, and has around 25 regional branches. It has a number of 'special interest groups' which comprise keen growers of the main alternative timber species – i.e. redwoods, eucalypts, cypresses etc. The NZFFA's Farm Forestry Timbers (FFT) group is also active in this space in representing specialty timber producers and users throughout New Zealand. There is a keen and knowledgeable membership and can be directly engaged to find out more about their forest resources.

Therefore a specific objective of the trade shows is to facilitate links between small-scale growers/farm foresters who have maturing woodlots of alternative species that are close to harvest and potential buyers that can successfully process and/or market specialty wood products.

Stage 2b Developing the School of Forestry mapping algorithm

The ongoing task for Stage 2 of this project is for work to continue at the School of Forestry to develop a mapping approach that automatically classifies alternative species. The work, which we believe is a 'first' in New Zealand, has merit both as novel research as well as in terms of its future practical application. Dr Vega Xu has had a positive response from all eleven larger corporate owners surveyed throughout New Zealand to her request to supply spatial compartment records of their alternative species resource.

This work will be reported on in another report, when completed later this year.

Appendix 1: Letter to woodlot owners

FOREST GROWERS RESEARCH

PO Box 1127
Rotorua 3040
Ph: + 64 7 921 1883
Email: forestgrowersresearch@fgr.nz
Web: www.fgr.nz

1 June 2021

ID: «ID» Area/ha «Area_ha»

«Owners»
«Company»
«Post_Address_1»
«Post_Address_2»
«Post_Address_3» «Post_Code»

Dear Forest Block Owner

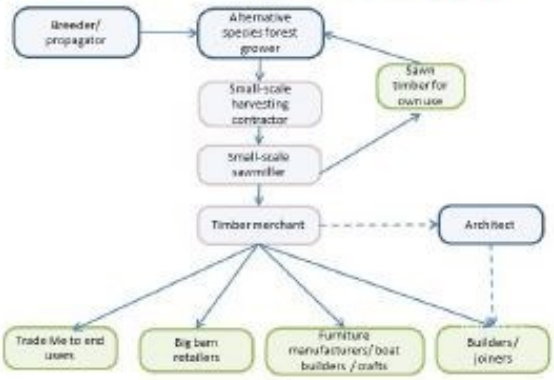
Do you want to harvest your alternative timber species in future? A forest industry survey of Hawke's Bay growers.

Forest Growers Research is undertaking a collaborative research project to survey owners of alternative timber species. This is to gather information toward improving the supply chain in the Hawke's Bay Region and beyond. We are contacting you because, through a pilot aerial mapping exercise undertaken by the University of Canterbury's School of Forestry, we have identified a woodlot of **alternative timber species over 1 hectare** in size on your property. The area of the woodlot we have identified, together with an ID number, is shown above. You may have other, smaller areas, but our current focus is on alternative species woodlots greater than 1 hectare. By 'alternative timber species' we mean cypresses, eucalypts, redwoods, blackwoods, poplar, native trees being grown for timber and others, but **excluding** radiata pine and Douglas-fir.

This pilot project is being run in partnership with the Hawke's Bay Regional Council and the Hawke's Bay Farm Forestry Association. The aim is to develop methods which can be used to undertake a national inventory of alternative timber species. An aligned project is working on developing NZ's small-scale sawmilling sector.

We need your help for this next stage of the project.

Many alternative species woodlots have been planted over the years as these species have potential to yield 'high value' timber. At the time of planting there was probably no guaranteed supply chain with markets for logs when ready for harvest; this is certainly the case for most growers now. The graphic below shows how the alternative timber species supply chain could function:



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Currently, there are small-scale sawmillers and harvesting contractors operating in Hawke's Bay and throughout New Zealand. However, growers may struggle to find a small-scale harvesting contractor or sawmiller, and to identify off-farm markets that make harvesting alternative species profitable. Cypresses can sometimes attract premium values in local and export markets, but other species may attract no interest with their value seen only as firewood or sale at the same or lower value as radiata pine.

The current stage of this project involves testing a new computer mapping algorithm which is being 'trained' to recognise and describe different alternative species from aerial images. If successful, this tool will provide accurate species information, which is a critical first step towards modelling potential wood flows. Better knowledge of potential wood flows will underpin efforts to support development of the small-scale sawmilling sector, which in turn may generate confidence in other sectors of the supply chain.

To verify the species being generated by the mapping algorithm we need to ask growers to provide details of their alternative species. To develop information to enable us to model wood flows, the other important information we need is about how the trees have been managed (e.g. pruned and thinned), the likely quality of the timber being grown, and your plans for harvest.

Will you help us?

We now need a group of growers willing to help with this research. If you are able to help, we ask that you go on-line and type in the link below to complete a short (10-minute) on-line survey.

Find the survey at: fgr.nz/survey_multi

For each woodlot identified at the start of this letter, we ask that **you enter the ID number** into the relevant box in the survey. Hopefully you will be able to recognise each woodlot according to the area given. We then require details of the species, management etc for each woodlot in turn. We apologise for the repetitive questions but no two alternative species woodlots are the same! All response data will be amalgamated, and we will not disclose any personal details in our reporting.

Please complete the survey by **15th June 2021**.

If you have any questions about this survey, please contact Harriet Palmer: harriet.e.palmer@gmail.com

Many thanks for your help.

Regards

[redacted]

Bart Challis
R&D Director
FGR Limited

Harriet Palmer (Survey Coordinator)
Marco Lausberg (Forest Growers Research Programme Manager, SWP)
Prof Bruce Manley, Dr Vega Xu (University of Canterbury, School of Forestry)