

Date: September 2020
Reference: RFP-TN003

Technical Note

Mapping perceptions of forest management impacts and the effect on social acceptability

Author/s: Karen Bayne, Andrea Grant, Marie McCarthy, Simon Makore

Corresponding author: karen.bayne@scionresearch.com

Summary: A segmentation study using values-based data and demographics to derive typologies of the public and their concerns surrounding forest management practices has resulted in five clusters of typologies being identified. This report provides preliminary insights into both the level of concern surrounding three forest management practices and outlines some characteristics of each of the cluster segments. Results show 1) a moderate to high level of public concern for the forest management practices we studied, 2) a generally low level of knowledge of forestry activities and 3) a mixed set of responses to forest management practices. There were key differences in 1) perceived levels of engagement in decision making, 2) values of forestry for the economy and 3) trust in the forestry sector.

Introduction

Outcomes from the Resilient Forests programme may see future changes in forestry management practice. While it is difficult to know how the public may perceive forestry at the end of a rotation of current plantings, indications of concern for current forest management practice may help to identify different segment typologies for the public based on social acceptability towards forest management practice.

A segmentation study was performed to develop prototypes of NZ public responses to plantation forest management practices, generating baseline prototypes characterised on social licence concerns regarding three forest management practices.

Market segmentation can take many forms, and markets are often segmented by one of four means:

- Geographic segmentation (location or region)
- Demographic segmentation (age, income, gender, ethnicity)
- Psychographic segmentation (values, attitude, identity, beliefs)
- Behavioural segmentation (active or inactive response)

Market segments must be both meaningful to those within them (i.e. relevant and identifying), while also containing elements that are commonly shared amongst the membership. Segmentation for this study used data variables in terms of psychographic and behavioural response (via perceptions, value and attitudes) to potential threats, and modifying demographic variables to help describe the resulting cluster segment.

This technote provides initial preliminary results of a survey using attitudinal measurements scales of previous known aspects that can impact forest management acceptability — such as knowledge about the sector, trust in the sector, impacts of the practice on community and environment, and spatial context (Wyatt et al., 2012) — along with personal values, politics and worldviews and environmental values/ attitudes towards nature (Clayton, 2003). The segmentation results produced five cluster typologies that can be used for understanding acceptability of forest management practices for NZ planted forests. In addition, Māori epistemological nature and values have also been evaluated, and comparison can be made between Māori and non-Māori responses.

This examination will inform the quantitative extension of social attributes for inclusion within the

portfolio framework, providing a better understanding of how different groups in society perceive current forest management practices and what the implications of those are on forestry social licence to operate (SLO).

Method

We conducted an online survey of a representative stratified sample ($n = 1501$) of members of the New Zealand public during August 2020. The survey focussed on attitudes towards forest management practices in New Zealand commercial forests, with a particular emphasis on:

- a) Harvesting on steep slopes
- b) Changing to different species in smaller sized forest areas
- c) Chemical sprays and pesticide use in forests.

These three practices were selected following a research team workshop that identified issues that are presently in the news and are of known public concern (i.e. Debris flows, safety with regard harvesting on steep slopes; afforestation policy) or may have social licence issues for forestry in future (species changes from different forestry regimes and objectives; restrictions on chemical levels or chemical use).

Each respondent was asked about one of three randomly selected forest management practices in terms of their level of knowledge about the practice, acceptance of the practice, the potential for the practice to impact their community and surrounding area, and engagement with the forest sector about potential community impacts.

In addition, level of overall concern for each of the practices, changes in levels of trust towards the forest sector, and perceptions of forest sector contribution to the regional economy were also gathered from all respondents.

Following the initial piloting, the survey was improved and distributed via a survey company panel. The survey sampling was slightly boosted to ensure an adequate representation of both Māori ($n=122$) and those younger than 25 years of age ($n=134$).

Survey data was analysed using the IBM SPSS software, and ArcGIS maps were produced to show regional variations (Refer figure 1 on page 4).

A Cluster analysis (K-Means) was undertaken on respondent attitudes to forest management practices; proximity to and frequency in visitations to a forest; and overarching values, in order to segment the public into groups with similar viewpoints.;

A series of infographic sheets have been produced outlining the results of the study, which focus on:

- a) Respondents views of forestry
- b) Viewpoints of each cluster segment
- c) Regional variations in viewpoints (by Territorial Authority)

- d) Māori viewpoints

Results

Level of trust in the forest sector

Overall, trust in the forest sector has remained similar within the public, with 80% stating they held the same level of trust as 5 years ago. However, there are regional and demographic differences in how trust has altered, noticeably Māori have a greater proportion who have decreased trust in forestry, and younger respondents having increased trust, and older respondents decreased trust. Trust in forestry is altered mostly through the media, government policy decisions, and personal observation.

Is forestry seen as good for the regional economy?

Overall, forestry is seen as good for the regional economy, with a mean score of 6.16 out of 10. Some regions (Carterton; Ruapehu) saw forestry as very good for the regional economy, with mean scores above 8.0 out of 10. Others (Otorohanga; Kawerau) had a mean score of less than 4.00 out of 10. Younger respondents (<30yrs) felt forestry was not as good for the regional economy.

How concerned are the public about forest management practices?

There is a moderate level of concern about both harvesting on steep slopes, and use of chemicals and pesticides within forests, and lower level of concern about changing to different species or different forestry regimes. Despite a low level of concern about species changes (4.7) the perceived risk to the community was higher than the level of concern. The perceived impacts and risks to the community are moderate for harvesting on steep slopes, and use of chemicals and pesticides also. Overall, there was a very low level of knowledge about what each of these forestry practices entails, and a low perception of forest industry engagement with the public about decision around how these management practices are being undertaken and the impacts that might result in their communities (Refer tables 1a-c below).

Segmentation

Segmentation of 1,192 respondents (those for which all data variables were complete) produced 5 clusters (Refer table 2 overleaf). The clusters were derived using forest-related data variables consisting of:

- Proximity to the nearest pine forest
- Frequency of visiting a pine forest
- Perception of benefit of forestry for the regional economy
- Trust in the forest sector
- Level of concern, knowledge, acceptance, perceived impact and engagement across three forest management practices (after Wyatt et al., 1995)
- Personal values, politics and worldviews
- Environmental values
- Level of social media use and volunteerism

Table 1a: Harvesting on steep slopes

	Harvesting concern	Acceptance	Knowledge	Level of Engagement	Perceived risk
Mean	6.6639	4.4849	3.6670	3.9708	5.7803
N	1458	497	497	497	496
Std. Deviation	2.22535	1.35386	1.32565	1.29929	1.19643

Table 1b: Changing to different species in smaller sized forest areas

	Species change concern	Acceptance	Knowledge	Level of Engagement	Perceived risk
Mean	4.6948	5.0625	3.6963	4.1621	5.4518
n	1245	512	512	512	512
Std. Deviation	2.48856	1.26947	1.16540	1.24538	1.21247

Table 1c: Chemical sprays and pesticides use in forests

	Chemicals concern	Acceptance	Knowledge	Level of Engagement	Perceived risk
Mean	6.3823	4.6640	3.3694	3.9636	5.8740
N	1423	494	494	494	494
Std. Deviation	2.52999	1.38099	1.36184	1.35589	1.25960

Table 1: Respondents mean scores concerning forest management practices. The following questions were scored on a scale of 0 – 10:

- **Concern:** "0 = 'not at all concerned' and 10 = 'extremely concerned'"
- **Acceptance; Knowledge; Level of Engagement and perceived risk scales:** "0 = 'very strongly disagree' and 10 = 'very strongly agree'"

Cluster characteristics:

Cluster 1 are the most highly concerned about all three forest management practices, however, they also feel that forestry is good for the regional economy and have increased their level of trust in the forest sector. This group are more likely to know someone working in forestry, who might have influenced their views. Demographically, almost half of the cluster (47%) resides in the Auckland region, they are highly metropolitan, and are likely to hold higher post-graduate and tertiary level qualifications (well educated). They are also more likely to be Māori, Pacific or Asian, and live in a larger household of more than 5 persons. The cluster is skewed towards those aged 20-24yrs and 30-34yrs of age.

Cluster 2 are the second most highly concerned about all three scenarios, and have a moderate knowledge of forest management activities. They are more likely to have decreased their level of trust in forestry. This group are also more likely to know someone in forestry, who might have influenced their views. The group are more likely to live near a pine forest and have visited a forest recently. They are more likely male and live in government-supplied rental accommodation. They are more likely to be European or Asian, aged 25-44 years of age.

Cluster 3 are accepting of forestry but are highly concerned about the impacts of forestry activities. They exhibit a moderate degree of concern about harvesting on steep slopes and chemical use in forest operations, but a low concern about forests changing to different species of smaller size. This group had very high concern for the risks and likely impacts from the forestry activities outlined, particularly the use of chemicals. The group are much less likely to have visited a forest recently. They are more likely to be older females, aged over 65 years of age.

Cluster 4: have very low concern (lowest across all the clusters) for the various forest management practices outlined. They have no close associates working in the industry, don't reside near a pine forest, and hold very low knowledge about forestry activities. This cluster is more accepting of the need for the forestry management practices outlined and feel that forestry is good for the regional economy yet feel a low level of engagement in decision-making. They are more likely than other clusters to state that their level of trust in the sector remains at a similar level to five years ago. Demographically, they are younger males, aged 16-25years (Millennials), living alone in rural urban townships. The cluster has a high proportion of Pakeha/European ethnicity, and a much lower than average proportion of Māori.

Cluster 5 are much less concerned about species change and use of chemicals than average but show a moderate level of concern for harvesting on steep slopes. They have limited knowledge about forestry activities but a higher acceptance of the need for the forestry practices outlined and feel higher engagement in decision-making around forestry management compared to other clusters. They feel forestry is very good for the regional economy. The cluster are more likely to have visited a pine forest recently, but they reside further away from the forest than those in Cluster 2, needing to drive for a while to get there. Demographically, they are older (65 yrs +), and reside in rural areas.

Further work

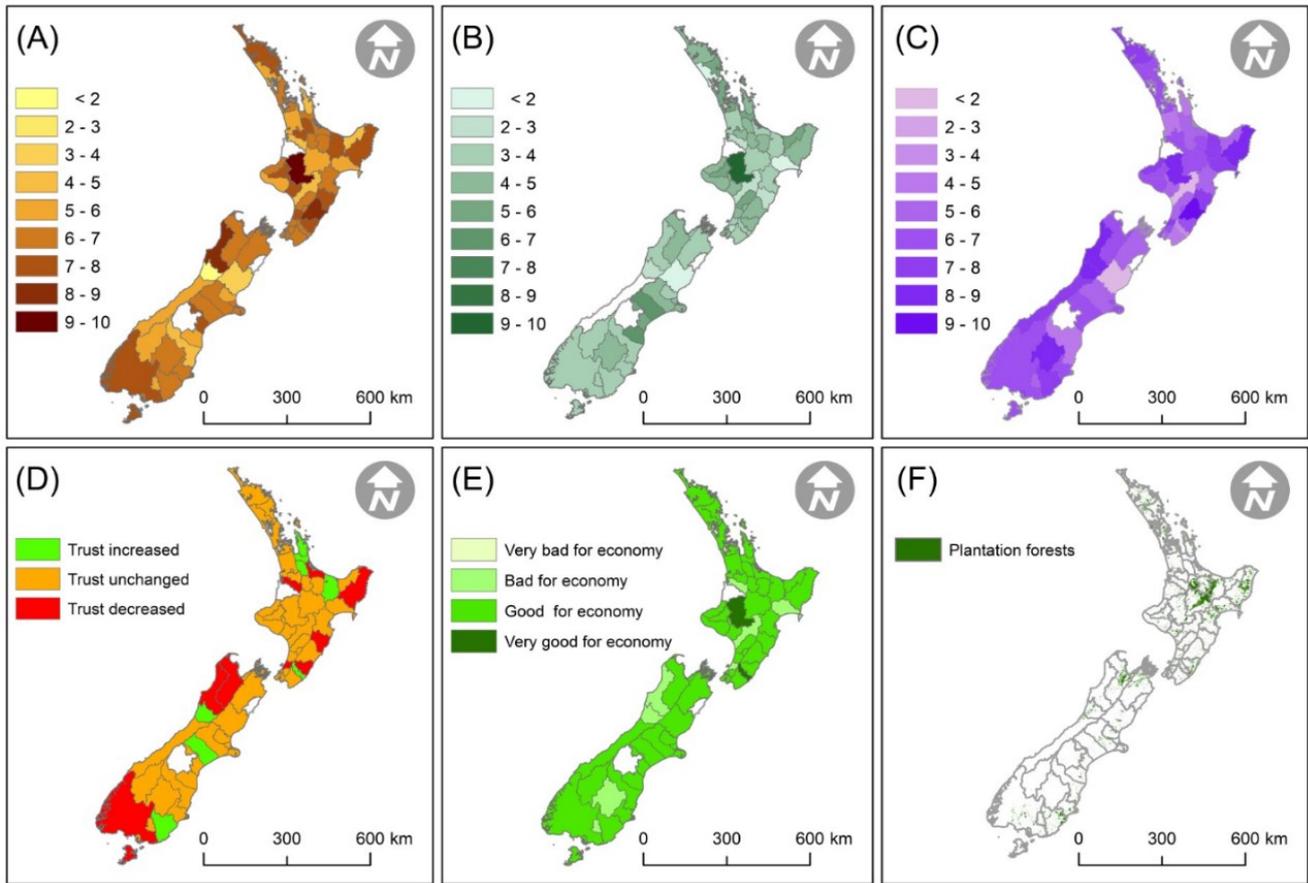
To supplement the survey, we will hold a series of focus groups with representative members of each cluster, to further examine attitudes, particularly the triggers and underlying reasons for concerns around current and future forest management practices. In addition, the qualitative data from the survey will be coded and analysed to provide better understanding and interpretation of the mean scores from the quantitative statements. A workshop will be held with the forest sector in December 2020 to provide an overview of results, explore implications on forest management and engagement with the public, and to determine further areas for analysis that would be useful to explore from the dataset

Key concern	Cluster 1 n=222	Cluster 2 n=222	Cluster 3 n=222	Cluster 4 n=274	Cluster 5 n=252
Harvest concern	Very high	High	High	Very low	Moderate
Species change concern	High	Moderate	Low	Very low	Very low
Chemicals concern	Very high	High	High	Low	Low
Trust in Forestry	Increased	Slight decrease	Slight decrease	Slight decrease	Slight decrease
Good for regional economy?	Very good	Good	Neither	Good	Very good
Knowledge of forestry activities	Low	Moderate	Very low	Very low	Low

Table 2: Overview of cluster characteristics

Figure 1: Regional variations in attitudes to forest management practices (Map A-C), trust in the sector (Map D), and perceived benefit to the regional economy (Map E). Map F denotes where New Zealand plantation forests are grown in relation to Territorial Authority boundaries. Maps A) through E) provide mean data by responses from each Territorial Authority (no data is available for Mackenzie; Kaikoura or Waitomo due insufficient response/ single respondent). Respondents provided attitudinal scores to the following questions:

- A) How concerned are you about harvesting on steep slopes, where 0 = 'not at all concerned' and 10 = 'extremely concerned'?
- B) How concerned are you about changing to different species in smaller sized forest areas, where 0 = 'not at all concerned' and 10 = 'extremely concerned'?
- C) How concerned are you about chemical sprays and pesticides use in forests, where 0 = 'not at all concerned' and 10 = 'extremely concerned'?
- D) Over the past 5 years has your level of trust in radiata pine forest management practices in New Zealand: decreased, increased, or stayed the same?
- E) In your opinion, do you think commercial forestry is good or bad for your regional economy, where 1 = 'very bad for the regional economy' and 10 = 'very good for the regional economy'?



Acknowledgements

Funding for this research came from Scion and the Forest Growers Levy Trust, with the support of the NZ Forest Owners Association (FOA) and the NZ Farm Forestry Association (FFA). The research team wish to thank Alasdair Allen of Research First for assistance with survey distribution; and David Palmer and Greg Scott for creating the infographics.

References

- Wyatt, S., Rousseau, M. H., Nadeau, S., Thiffault, N., & Guay, L. (2011). Social concerns, risk and the acceptability of forest vegetation management alternatives: Insights for managers. *The Forestry Chronicle*, 87(2), 274-289.
- Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton, & S. Opatow (Eds.), *Identity and the natural environment. The psychological significance of nature* (pp. 45–65). Cambridge: The MIT Press.