

**OKAREKA MISTLETOE RESTORATION PROJECT**  
**— MISTLETOE MONITORING REPORT PUBLISHED**

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The Department of Conservation has just published a report compiled by Johlene Kelly of Alchemists Ltd (Kelly, 2014) analysing the results and producing conclusions from 15 years of mistletoe monitoring at the Blue Lake Holiday Park and 11 years of monitoring in Tikitapu Scenic Reserve. The latter is part of the 150 ha which have been under active animal and plant pest management since the early 2000s as part of the Okareka Mistletoe Restoration Project being undertaken by Rotorua branch of Forest and Bird and Rotorua Botanical Society, with support from the Department of Conservation and Bay of Plenty Regional Council.

There are two green mistletoe species present in Tikitapu Scenic Reserve, the largest population being *Tupeia antarctica* with a smaller population of *Ileostylus micranthus* present mainly around Blue Lake Holiday Park. As the Okareka Mistletoe Restoration Project was founded partly on the presence of a reasonably large population of mistletoes present in Tikitapu Scenic Reserve it made sense to monitor changes in the health, distribution and abundance of these two species as a key indicator as to whether the project was meeting its objectives (set in 2002), one of which was to “increase the distribution and numbers of two mistletoe species (*Ileostylus micranthus* and *Tupeia antarctica*) within the management area.

The monitoring consists of transects and plots established within Blue Lake Holiday Park and in the known mistletoe area in the NE corner of Tikitapu Scenic Reserve bordering Okareka Loop Road near Benn Road. Monitoring involved scoring both tagged mistletoe plants and their host trees for a range of health indicators using what is known as the Foliar Browse Index (FBI) monitoring method (Payton et al, 1999) modified for mistletoe monitoring (Department of Conservation, 2001). This included setting up seven recruitment plots in areas where no mistletoe were present to monitor

changes in mistletoe distribution and abundance. FBI monitoring at Blue Lake Holiday Park commenced in 2001 and in 2002 in Tikitapu Scenic Reserve, before intensive pest management began, and was remeasured in 2007 and 2012 at Blue Lake and in 2007 and 2013 at Tikitapu Scenic Reserve.

## **Results and Conclusions**

### At Blue Lake Holiday Park

- Health of existing mistletoe plants (both *Tupeia* and *Ileostylus*) has improved while health of hosts has remained stable.
- There is an ongoing high mortality of host trees (mainly kohuhu and five finger), and hence mistletoe plants as a result. In 2011 only 8.6% of the sample of monitored mistletoes tagged in 1997 were still alive. In 2011 only 34% of the mistletoe sample tagged in 2001 were still alive. As possum browse scores have been low and have declined since 2007 the host tree death is generally believed to be largely due to the short-lived host trees dying of old age rather than possum impacts.
- It is unclear whether there is wider mistletoe recruitment at this site or not, as with limited forest area within the Holiday Park site there is only one recruitment plot.

### At Tikitapu Scenic Reserve

- Health of mistletoe species (*Tupeia*) and its host trees showed a very slight decline over time for both hosts (five-finger) and mistletoes but overall has been relatively stable.
- Possum browse on both mistletoe host trees and *Tupeia* mistletoe plants was negligible and results indicate that possum browse was relatively low prior to control beginning as well.
- As possum browse scores are very low small changes in *Tupeia* mistletoe and host health over time may be due to age of monitored individuals.
- Total *Tupeia* mistletoe volume (length x width x height) showed a large increase from 2002 to 2007 and then a decrease from 2007 and 2013. Reasons for this are unclear but may be related to increasing poor condition as mistletoes age and smaller new mistletoes are being recruited into the sample size.

- There has been 20-30% host tree mortality between sampling events, and again, like at Blue Lake, this probably indicates the relatively short-lived nature of the host trees.
- Seven recruitment plots established showed zero mistletoe plants in 2001, 22 in 2007 and 127 in 2013. The percentage of all FBI plots with one or more live mistletoe was 50% in 2002, 68% in 2007 and 77% in 2013. These results demonstrate that there has been a massive increase in both *Tupeia* mistletoe numbers and density within the management area from recruitment of new plants. While this has likely been assisted by possum control measures, other factors such as an increase in bird numbers because of rat and possum control may have assisted in dispersal rates.

### Summary

- Therefore it is likely that ongoing possum control is having a positive impact on mistletoes at both Blue Lake Holiday Park and Tikitapu Scenic Reserve. With the benefit of possum control, the *Tupeia* mistletoe population is now expanding throughout suitable habitat within the reserve into areas where it was not previously present. Results for *Ileostylus* are less clear mainly because of the very small number of plants present in Tikitapu Scenic Reserve but suggest it is at least stable at Blue Lake Holiday Park.
- This monitoring indicates that the Ōkareka Mistletoe Restoration Project has met its objective to “increase the distribution and numbers of *Tupeia antarctica* within the management area.”

This report shows some good results which although not all as clear cut as we would like, do demonstrate that the project has met at least one of its key objectives in regard to mistletoes, which are the key iconic species partly around which the project was set up. Mistletoe monitoring will continue on a five-yearly basis to determine future trends in mistletoe health, abundance and distribution within the reserve.

The Department of Conservation wishes to thank all the volunteers from Rotorua branch of Forest and Bird, Rotorua Botanical Society and other locals who have assisted with the monitoring programme since 1997. Anyone who would like to see a full copy of

the report can contact Paul Cashmore at the Department of Conservation, Rotorua District Office on [pcashmore@doc.govt.nz](mailto:pcashmore@doc.govt.nz) or phone 07 3497 432.

## REFERENCES

Department of Conservation. (2001). *Mistletoe Recovery Group - Best Practice for Monitoring Loranthaceous Mistletoe - WSCCO- 22338*. Department of Conservation.

Kelly, J. (2014). *Tikitapu Scenic Reserve mistletoe (Tupeia antarctica and Ileostylus micranthus) monitoring 1997-2013*. Report prepared by Alchemists Ltd for Department of Conservation, Rotorua.

Payton et al. (1999). *Foliar Browse Index: A Method for Monitoring Possum (Trichosurus vulpecula) damage to plant species and forest communities*. Wellington: Manaaki Whenua - Landcare Research.