THE IMPACT OF HONEY BEES ON MONTANE ECOSYSTEMS WITHIN TONGARIRO NATIONAL PARK

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ABSTRACT

A study of the effects of honey bees on montane ecosystems was conducted during the summers of 1993/1994 and 1994/1995 at Tongariro National Park. Three possible effects of the introduced honey bee were examined. The primary aims of the study were to identify areas with and without honey bees and to identify differences in the pollination success of a weed species, heather (*Calluna vugaris*) and a native species, the New Zealand flax (*Phormium tenax)* under different pollinator regimes, and to examine differences in the composition of native pollinator communities in these different bee areas.

The impact of honey bees on the reproductive success of heather, an important weed species in Tongariro National Park was examined over two flowering seasons. Insect visitation rates on heather flowers were low at each of the four study sites. Bagging plants to exclude insect flower visitors had little effect on female fitness. The potential of other pollen vectors, wind and thrips, as pollinators of heather was also examined. Both were determined to have a negative effect cn several measures of female success, including pollen depostition, pollen tube formation, and pollination levels. However it appears that none of the pollen vectors (honey bees, wind or thrips) significantly effect the overall fitness of heather in terms of the viable seed produced.

The second part of the study examined the impact of honey bees on the pollination systems of a native plant species. Flax is thought to be predominantly bird pollinated, however, the floral resources are also utilised by a variety of native and introduced insect species. At some sites birds were either not present or rarely used the flowers. Seed set in flax was highest in heavily bird pollinated sites. The results also suggest, however, that flax has a flexible pollinating system that enables it to maintain a range of fruit and seed set levels under the different pollintor regimes.

The abundance and diversity of insect flower visitors on manuka and *Hebe* stricta, two common subalpine shrubs, was highly variable between sites, and between observation periods. Some of this variation may be described to differences in the weather or to altitude. However, I have shown that the abundance and diversity of diptera appears to be strongly influenced by levels of honey bee activity. This indicates that honey bees do play a role in determining the structure of pollinator communities and may be displacing a significant component of the native pollinating fauna.

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