CASE STUDY:
EMERALD FURROW BEE

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Case study of a neglected incursion

Species

Emerald furrow bee (*Seladonia hotoni*)[1].

Origin

Africa.

Australian occurrence

NSW.

Potential environmental impacts

This bee 'could have serious impacts due to its high relative abundance, long seasonal activity, and an apparent preference for introduced plants and declared noxious weeds in New South Wales'.[2] Too little is known yet to predict its ecological impacts but bioclimatic models suggest it will thrive across much of Australia.[3] Impacts could include competition with native fauna, transmission of parasites and pathogens, disruption of native plant pollination networks and exacerbation of weed problems.

Potential economic or social impacts

Likely costs include those due to increased weed spread.

BIOSECURITY ISSUES

Summary

The emerald furrow bee was discovered by chance in riparian areas of the Hunter Valley, NSW, November 2004.[4] Although a recent introduction (it hadn't been observed in past surveys), it was well established, being the second most common bee trapped in some places. Apart from a few surveys in 2008-10 funded by philanthropy, this new introduction has been ignored. Little is known about the bee's ecology, distribution and impacts. By the time impacts become clear it could be too late to do anything about it. It is important to prevent further introductions that could increase the species' environmental tolerances in Australia.

Emerald furrow bee. Photo: Stefan Schmidt

Risk assessment and contingency planning

As far as we are aware there has been no risk assessment or contingency planning for this species. Ashcroft et al. (2012) warn that it 'would be prudent to prevent further introductions that could diversify the gene pool and broaden the environmental tolerance of the species in Australia'.

Quarantine

It is not known how the bee entered Australia. DNA from specimens showed two maternal lineages, indicating the introduction of more than one individual.

Monitoring and research

This bee incursion exemplifies a catch 22 in environmental biosecurity. Governments are loath to fund management without evidence of serious impacts but by the time the impacts become clear it is typically too late to eradicate or contain invasive species. Furthermore, funding for research is extremely limited. Surveys to determine the distribution of this bee were done with philanthropic funding.[5] The surveys included the involvement of citizen scientists, an increasingly viable option for some biosecurity work.[6]

CHANGES NEEDED

Incursion responses

- New incursions should automatically trigger precautionary risk assessments to determine the most appropriate response.
- Resources should be dedicated to developing the capacity of citizen scientists to conduct surveillance for new incursions.

Risk assessment and contingency planning

- Given that three new exotic bees established in Australia have been detected since 2000, risk assessments, pathway analysis and contingency planning should be conducted to reduce the risks of further bee incursions, including new variants of existing naturalised species.

REFERENCES

Ashcroft M, Gollan J, Batley M. 2012. Combining citizen science, bioclimatic envelope models and observed habitat preferences to determine the distribution of an inconspicuous, recently detected introduced bee (*Halictus smaragdulus* Vachal Hymenoptera: Halictidae) in Australia. Biological Invasions 14:515–527.

Batley M, Pauly A, Gollan JR, Ashcroft MB, Sonet G. 2016. Re-identification of an exotic bee introduced to the hunter valley region, New South Wales - *Seladonia hotoni* (Vachal, 1903) (Hymenoptera: Halictidae). *Australian Entomologist* 43(3):109–12

Gollan J. 2009. Ecology of a recently discovered exotic bee (*Halictus smaragdulus*) in Australia. Final report to the WV Scott Charitable Trust. Australian Museum.

ENDNOTES

1 The bee was initially identified as a Mediterranean species, *Halictus smaragdulus* (Gollan 2009, Batley et al. 2016).

2 Ashcroft et al. (2012).

3 Batley et al. (2016).

4 Gollan (2009).

5 Gollan (2009).

6 Ashcroft et al. (2012).

invasive species council