Integrated Conservation and Translocation Research Program for *Caladenia huegelii*

Key Findings

CONSERVATION MANAGEMENT PLAN
APPENDIX E

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The following is a summary of key findings arising from the Botanic Gardens and Parks Authority Research co-ordinated by Professor Kingsley Dixon and funded by Jandakot Airport Holdings as required by EPBC 2009/4796 condition 6e (vi) and detailed within the Jandakot Airport Offset Plan. This five year research program has provided a conservation off-set to enable research into critical aspects of *Caladenia huegelii* - its population biology, pollination ecology and ex situ conservation - to facilitate long term conservation of the species.

- The development of a novel approach to sequential protocorm production that will be of value to generate a renewable supply of protocorms for cultivation to sustain small populations of *C. huegelii*.
- *C. huegelii* only associates with one species of mycorrhizal fungus. However, this fungus is widespread throughout south-western Australia in a range of soil types and habitats.
- Ex situ seed banking and banking of the mycorrhizal fungus has been achieved.
- Large-scale propagation of the species has been perfected and resulted in a milestone achievement in the first flowering of a translocated population in 2014 on JAH land at Jandakot.
- Off-site cultivation of *C. huegelii* has been perfected and seedling to first flowering can be achieved within two years, including the capability for repeated flowering.
- Off-site, green-house seed orcharding has been perfected for *C. huegelii* where it is now possible to generate large quantities of seed (gram quantities equivalent to many millions of seeds) from controlled pollination, which ensures vigorous seedlings can be produced.
- Weak genetic variation between populations means that mixing of populations in translocation programs will not result in substantial changes to the population genetic structure of *C. huegelii*. However, mixing of populations may have significant advantages in terms of providing improved genetic vigour in offspring.
- The only detected pollinator species of *C. huegelii* is the small form of the thynnine wasp *Macrothynnus insignis*.
- The pollinator species is scarce throughout the range of *C. huegelii*, and was only detected at one known population of *C. huegelii*. The pollinator was not recorded from any bushland remnants in urban Perth.
- All populations of *C. huegelii* have very low levels of reproductive success, with a high portion of populations failing to set fruit in any given year, which will require intervention by artificial hand pollination to sustain these populations.
- A dietary study of *M. insignis* showed that it has a preference for nectar of open-flowered members of the Myrtaceae, which should guide perimeter planting species and restoration composition.

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