



Nigel Swarts*, Kingsley Dixon & Andrew Batty

Kings Park and Botanic Gardens, The University of Western Australia

Kings Park Fraser Ave

West Perth 6005

Australia

nswarts@bgpa.wa.gov.au

Applying the principles of endophyte specificity for resolving reintroduction hotspots for the translocation of threatened terrestrial orchids

The critically endangered orchid *Caladenia huegelii* is confined to highly urbanised remnants with most significant populations under threat. This study was undertaken to derive ecological principles for sustainable translocation of *C. huegelii*. The study investigated the use of detailed mapping of the mycorrhiza of *C. huegelii* to determine where endophyte hotspots occur to facilitate the transplanting of adult plants (in the pathway of a highway development) to safe sites; relationships between *C. huegelii* and congener sympatric species' endophytes; use of seedlings for re-establishment of new populations. The study found that approximately 50% of translocated orchids have survived the first two seasons post-transplant and exhibited comparable growth and reproductive output relative to control plants with survival enhanced by the presence of a tuber sheath. Common congeners of *C. huegelii* at the transplant site were found to be compatible with all other *Caladenia* endophytes, however, *C. huegelii* was restricted to self-endophytes indicating that the rare *C. huegelii* may not be as ecologically competent in comparison with the five other *Caladenia* species at the site. *Ex situ* generated seedlings were found to establish more successfully to a site when planted within clusters of *C. huegelii* adult plants supporting the principle that *C. huegelii* distribution is strongly linked to local endophyte abundance. This research forms part of the development of an integrated conservation strategy applicable to the recovery of this and other rare terrestrial orchid species.