



Global Re-introduction Perspectives: 2013

Further case-studies from around the globe
Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)





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Brown treecreeper re-introduction into eucalypt woodland in the Australian Capital Territory, Australia

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Introduction

The brown treecreeper (*Climacteris picumnus*) is a small ground-foraging bird endemic to eastern Australia. The species is listed as vulnerable under the Australian Capital Territory *Nature Conservation Act 1980* and the New South Wales Threatened Species Conservation Act 1995 (subspecies *victoriae*). The brown treecreeper is a facultative cooperative breeder, living predominantly in gregarious social groups comprised of a breeding pair and a number of offspring that have delayed dispersal. The species nests and roosts in tree cavities and is almost entirely insectivorous. There is evidence of dramatic declines of this species throughout its range. The main causes of decline are considered to be habitat



Brown treecreeper © Veronica Doerr

degradation, such as the loss of tree hollows and components of high quality ground-foraging habitat such as coarse woody debris and ground litter. Further, habitat fragmentation significantly disrupts the recruitment of females owing to the short-distance dispersal capabilities of the species. Female offspring tend to disperse earlier and further than males, however this is generally only a distance of 1 - 2 km. The brown treecreeper was re-introduced into Mulligans Flat and Goorooyarroo Nature Reserves, which are two connected eucalypt woodland reserves that are undergoing ecosystem restoration in south-east Australia. The species was recently locally extinct from these reserves.

Goals

- Goal 1: Installation of experimental restoration treatments in the nature reserves where the re-introduction was to be conducted. The re-introduction and subsequent survival, behavior and habitat use of re-introduced individuals was used to assess the success of these restoration treatments.
- Goal 2: Successful selection and translocation of brown treecreeper social groups from the source population to the re-introduction site.
- Goal 3: Establish a self-sustaining population based upon survival and reproduction indicators.
- Goal 4: Intensive monitoring of re-introduced individuals to obtain information on brown treecreeper behavior, movement and habitat use.
- Goal 5: Examination of the factors influencing the outcome of the re-introduction.

Success Indicators

- Indicator 1: Successful release of brown treecreepers.
- Indicator 2: Survival rate over time: survival of 70% of re-introduced adult birds 3 days after release, 50% at 4 weeks after release, and 40% at 1 year after release.
- Indicator 3: Successful reproduction, with the survival of at least one young to fledgling from at least one social group within two years.
- Indicator 4: Detailed examination of data collected on brown treecreeper survival, behavior, movement, and habitat use to provide unique information regarding this species in an unfamiliar, experimentally restored environment.

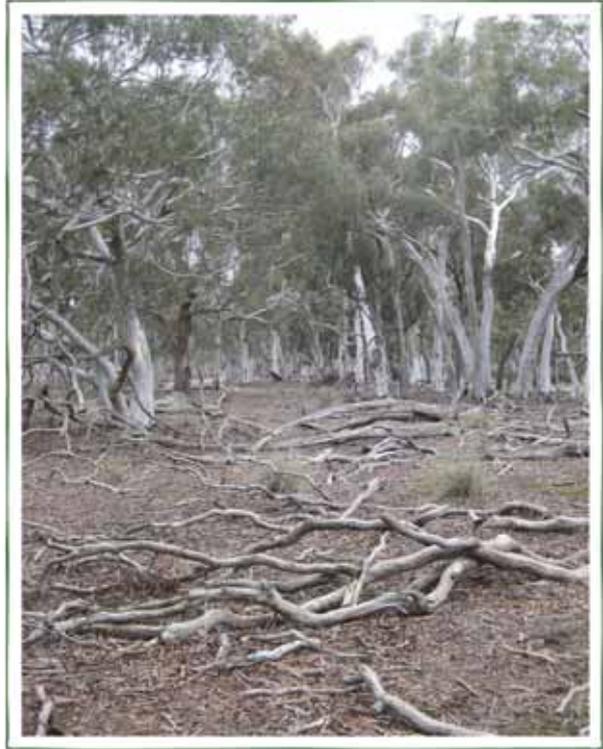
Project Summary

Feasibility: Brown treecreepers were sourced from populations 200 km west of the release site, in the Murrumbidgee region of New South Wales, Australia. These source populations were the most appropriate for re-introduction as they had been studied extensively, the birds' social relationships were known, and the populations were considered sufficiently stable and large to allow the removal of some individuals without compromising the stability of the populations.

The reserves where re-introduction took place, Mulligans Flat and Goorooyarroo Nature Reserves (measuring 1,623 ha), are the site of a large long-term restoration project. Habitat manipulations in these reserves included the addition of 2,000 tons of coarse woody debris, management of variation in ground

vegetation cover through kangaroo exclusion areas, and the installation of brown treecreeper nest boxes. These manipulations were considered to be beneficial in reversing habitat degradation, which was the likely cause of local decline for the brown treecreeper. The restoration manipulations were implemented as experimental treatments to enable examination of the effects of treatment combinations on brown treecreeper survival, movement, behavior and habitat selection.

Implementation: Brown treecreepers were re-introduced in November 2009. Birds were released in social groups containing dependent fledglings to maintain bonds between individuals in a group. One social group was captured and released per day as a hard release to minimize handling



Mulligans Flat Nature Reserve
settlement site © Victoria Bennett

time and avoid unnecessary stress. Seven brown treecreeper social groups were re-introduced, comprised of 43 individuals (26 adults and 17 fledglings). Each individual was fitted with a unique combination of coloured leg-bands. Additionally, radio-transmitters were fitted to the breeding female and one or two helper birds per social group (total of 18 adult birds). The re-introduction was performed experimentally, by releasing different social groups in areas that had been subject to different habitat restoration treatments. Social groups were released in areas with combinations of two experimental treatments: i) high or medium level of ground vegetation cover, and ii) the presence or absence of nest boxes.

Post-release monitoring: Released birds were monitored daily until February 2010, with observations recorded for survival, location, behavior and substrate use. Ongoing visual monitoring of survival was conducted until March 2011. Short-term post-release survival rates were high over 24 hours (93%) and 3 days (91%), with high levels of social group cohesion maintained. The number of adults and fledglings confirmed alive over the initial three month monitoring period steadily declined. There were no apparent differences in survival between males and females, adults and fledglings, social groups, or between birds that carried radio-transmitters and those that did not. The coarse woody debris supplemented

to the reserves appeared to benefit the brown treecreeper through influencing their behavior and significantly increasing the probability that an individual would forage on a log or on the ground. This potentially occurred through influencing the individual's foraging efficiency. However, variation in ground vegetation cover did not influence the species' behavior and substrate use. This may have been caused by the overall limited use of the ground layer, particularly in relation to previous studies on the species. This suggests that the degrading processes previously acting in the reserves have not been sufficiently reversed.

All radio-tracked brown treecreepers were recorded leaving their immediate release site, irrespective of the habitat experimental treatments at their release sites. This result suggests that re-introduced individuals may always explore their surroundings regardless of the quality of the habitat they are provided with. Individuals were observed moving extensive distances, with significant variation in search area among individuals. This may be a result of the re-introduction process, or indicate a rejection of the release site. However, the result also indicates that re-introduced individuals are likely to be able to adjust their movement behavior and find suitable habitat. Settlement of social groups was significantly affected by the level of ground vegetation cover, with dry forest areas with low vegetation cover having the highest proportional rate of settlement.

Despite the experimental restoration conducted within the reserves and attempts to conduct the re-introduction within a best-practice framework, the re-introduction failed to meet all of the predetermined criteria for success. This was particularly the case for medium-term survival. Further examinations were conducted to compare the habitat within the nature reserves where the re-introduction took place and the habitat at the source population. Although predation appeared to play a key role in bird survivorship, there was no significant difference in predation pressure identified between the two habitats. However, re-introduced individuals may have been particularly vulnerable to predation because of an increased flight time to reach a refuge area when under threat due to a lower number of refuge areas in the re-introduction reserves compared with the source sites. A lower ground foraging habitat quality was also identified at the release sites, however, brown treecreepers were able to disperse extensively throughout the reserves and settle in areas with generally higher-quality foraging habitat.

Major difficulties faced

- Much lower survival rates of re-introduced brown treecreepers over the first year than have been reported in any naturally occurring population of brown treecreepers.
- Higher predation levels of released individuals than expected, particularly by native avian predators. All known deaths of radio-tracked birds ($n = 4$) appeared to be due to predation by native predators. To a smaller extent, elevated densities of aggressive species such as the noisy miner (*Manorina melanotis*), negatively influenced brown treecreeper releases and may act as a barrier to re-colonisation by other locally extinct species.
- Released individuals were observed dispersing across extensive distances that were greater than distances previously observed among brown

treecreeper natal dispersers. This was despite existing studies examining brown treecreeper natal dispersal in detail. Extensive dispersal caused logistical difficulties in effectively monitoring all individuals and confirming their survival, despite radio-tracking, and particularly once radio-transmitters were no longer functioning and during and after the



Social group just before release © Peter Mills

time when the species normally disperses. Hence, the disappearances of some individuals could be a result of dispersal, not just death.

- The re-introduction was a large logistical project requiring extensive organization of licensing, acquisition of funds, equipment and personnel. This project was conducted as a post-graduate project and was therefore somewhat restricted in the amount of monitoring conducted. Therefore, there were ample additional hypotheses available for examination stemming from this project.

Major lessons learned

- Brown treecreeper short-term survival was very high, and social groups maintained high group cohesiveness, suggesting that the species handled the translocation process well. This result emphasized the importance of knowledge of the social groups present in the source population.
- Regardless of existing knowledge of brown treecreeper habitat preferences in other populations, re-introduced individuals selected habitat contrary to expectations, selecting forest rather than eucalypt woodland. This result emphasized that behavior and habitat use information from prior studies within a source population may not approximate that which is observed within a re-introduced population.
- Brown treecreepers displayed an increased probability of foraging on a log or on the ground when within areas that coarse woody debris had been experimentally added to the reserves. This behavior indicated that the addition of coarse woody debris benefited the species potentially through influencing foraging efficiency, and also demonstrated the value of using behavior as a bio-indicator for restoration success.
- Further consideration of, and investigation into, the elements influencing predation by natural predators is required to enable conservation of ground-foraging insectivores and is essential prior to any re-introduction of similar species.

- Continued restoration is required in the reserves where the re-introduction took place. This includes consideration of finer-scale habitat components such as management of the ground layer through promoting the development of a cryptogamic crust, an increased leaf litter layer, reduced weed cover and controlled levels of grazing pressure by both native and exotic herbivores. This result reinforces the need to closely examine the habitat suitability before a translocation.

Success of project

Highly Successful	Successful	Partially Successful	Failure
			√

Reason(s) for success/failure:

- The re-introduction process itself was highly successful particularly given the high survival rates over 24 hours and 3 days post-release (93% and 91% respectively) and the high level of group cohesion observed immediately after release.
- Although the criteria for success regarding adult survival over 3 days (70% survival) and 4 weeks (50% survival) were achieved, the survival rate of adult brown treecreepers over 1 year (15%) did not meet the criteria for success (40% survival). This was despite attempts to address the previous causes for the decline for the species and restore the habitat. This indicates that in order to establish a viable population, further releases of larger numbers of individuals over several years would be required.
- No instances of successful reproduction was observed despite regular monitoring of females. Although, a male was seen feeding a female on seven separate occasions during November 2010. This was noteworthy given that breeding females appear not to accept courtship feeding unless they intend to attempt to reproduce.
- Although in terms of survival rates, the re-introduction did not succeed, the project provided unique and important knowledge regarding brown treecreeper behavior, habitat use, movement, restoration ecology of eucalypt woodlands, and the procedures of re-introducing a social bird species.

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