

Assessment of protocols and best-practice techniques learned during a translocation of South Island saddlebacks *Philesturnus carunculatus* from Ulva Island to Orokonui Ecosanctuary, New Zealand

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SUMMARY

A translocation of South Island saddlebacks *Philesturnus carunculatus* from Ulva Island to Orokonui Ecosanctuary near Dunedin, New Zealand was conducted by a community group and university scientists in April 2009. In this paper we describe and assess methods used during this complicated five day translocation, which involved birds being held over-night in transfer boxes. Post-release surveys determined a minimum of 79% of individuals survived the critical initial 48 h after release. The survival rate did not appear to be affected by the presence or absence of perches in each transfer box, although the lack of perches does not follow best-practice for most passerine translocations. Experienced advisors should be involved during every phase of the translocation process.

BACKGROUND

The process of translocating animals is composed of multiple stages (capture, holding, transfer and release) and often spans several days. The capture stage is often the most time consuming, while the transfer and release stages are usually completed together in one day because the release site is typically near the source population (e.g. Parker & Laurence 2008). However, translocations to more distant release sites may take multiple days and add to the logistical complexity of a translocation. Complicated translocations are particularly challenging for relatively inexperienced community groups, who are increasingly initiating, organising and conducting translocations (Parker 2008).

The South Island (S.I.) saddleback is an endemic New Zealand wattlebird recently downgraded from 'Nationally Endangered' to 'At Risk – Recovering' by the New Zealand Department of Conservation's Threat Classification System (Hitchmough *et al.* 2005, Miskelly *et al.* 2008). Prior to this most recent translocation, all 18 populations of S.I. saddlebacks existed on remote offshore islands due to translocation events that were initiated after the birds became extinct on the mainland (Hooson & Jamieson 2003, Ian Jamieson unpublished data). Saddlebacks have become one of New Zealand's most successfully translocated passerine species because of their broad habitat requirements and high reproductive rate (Lovegrove 1996, Pierre 1999). As a result, they are now one of the first species translocated to predator-controlled

mainland sanctuaries, where they can be accessible to the general public.

This case study describes a recent 300 km long-distance translocation of 40 S.I. saddlebacks from Ulva Island to Orokonui Ecosanctuary, a mainland sanctuary near the city of Dunedin (Otago). The translocation was initiated, organised, and conducted by a local community group and university scientists, with advice and assistance from managers from the New Zealand Department of Conservation.

ACTION

Ulva Island: Ulva Island (259 ha) is a predator-free open sanctuary in Paterson Inlet, Stewart Island, managed by the Department of Conservation. Thirty saddlebacks were reintroduced to Ulva from Big Island in April 2000 (Hooson & Jamieson 2003) and the current population estimate prior to this translocation to Orokonui was 250 individuals (Ian Jamieson unpublished data).

Orokonui Ecosanctuary: Orokonui Ecosanctuary (307 ha) is a community-based fenced sanctuary managed by the Otago Natural History Trust. A pest-resistant fence was built in 2007, and intensive trapping and poisoning reduced introduced mammalian predators to low levels by November 2008. The sanctuary's vegetation consists of mostly 100 year-old kanuka *Kunzea ericoides* dominated forest, with small remnants of primary podocarp-broadleaved, *Eucalyptus reganans*, and pine forests, all of which provide suitable feeding and nesting habitats for saddlebacks. Saddlebacks were the first bird species translocated to Orokonui Ecosanctuary from a wild source population. There are plans to translocate additional endemic bird and invertebrate species to provide the general public an accessible means to view rare endemics.

Capture and handling techniques: Forty birds were targeted for capture on Ulva, as approximately 40 birds were released during recent successful mainland introductions of North Island saddlebacks *P. rufusater* to areas of high dispersal potential (Smith & Jamieson 2009). Four catching teams of 3-4 individuals each employed mist-nets and lure playback techniques (see Parker & Laurence 2008) to capture 17 and 18 birds on 14 and 15 April 2009, respectively. Three and two additional birds were captured on 16 and 17 April, respectively. Once captured, birds were carried to the banding station in a black cotton bird bag as quickly as possible (15-25 min walk, approximately 0.5-1.8 km). Each bird was fitted with a unique metal leg ring (band) and unique combination of colour rings, and morphological measurements such as tarsus length, bill length, and wing length were taken. A small blood sample (<0.01 ml) was taken from the brachial vein for genetic analysis, and a blood slide and faecal sample were collected for potential disease analysis. A general assessment of overall condition was conducted on each bird as a clean bill of health was a prerequisite for transfer.

The 35 birds captured during the first two days (14-15 April) were held for a maximum of 28 hours in a tent aviary (approximately 2 x 4 x 7 m) and supplied with food (halved oranges and apples, sugar buns, live mealworms *Tenebrio molitor*) and water (see Lovegrove & Veitch 1994, Taylor & Jamieson 2007). The final five birds captured over the last two days (16-17 April) were placed directly into transfer boxes. The weather was warm and mild during the 4-day capture period (maximum temperatures 18.0-19.5 °C).

Transfers

First transfer group (35 birds): The first transfer was initiated in the late afternoon with an early release the following morning to allow the birds a full day to find foraging and roosting sites. At 15:00 h on 15 April, all 35 birds were re-captured with cotton hand-nets from the tent aviary, weighed in cotton bird

bags, and placed into wooden transfer boxes containing halved oranges and sugar buns as a food source. The capturing and processing of all birds was performed within a 45 min timeframe. Three different types of wooden transfer boxes were used to transport the birds. Six 'medium' transfer boxes (640 mm length x 310 mm width x 255 mm height, two compartments) held two birds per compartment and, unknown at the time, did not have wooden perches. Two 'large' transfer boxes (825 mm length x 320 mm width x 310 mm height, two compartments) held two birds per compartment, except for one compartment that held three birds, and had perches. One 'small' box (410 mm length x 320 mm width x 230 mm height, two compartments) held one bird per compartment and did not have perches. One side of each transfer box was enclosed with bird netting or window screen, covered with a dark coloured cotton shade cloth to allow in air and light (Lovegrove & Veitch 1994). The transfer boxes were moved from the aviary site to the wharf (10 min), transported by boat (15 min), truck (5 min), passenger ferry (1 h), and van (4 h) to Orokonui Ecosanctuary. Upon arrival at Orokonui Ecosanctuary at 23:00 h, the transfer boxes were placed in a darkened garage, food was replenished, and honey water in a small plastic container was added to each box.

Second transfer group (3 birds): The three birds captured on 16 April were placed directly into a 'large' transfer box after being processed at 15:00 h. As with the first transfer, the birds were transported to Orokonui Ecosanctuary via boat, truck, passenger ferry and car. Because of high seas, food was not placed into the transfer box until after being transported on the passenger ferry. The birds arrived at Orokonui Ecosanctuary at 22:30 h and were held in a darkened room overnight.

Third transfer group (2 birds): The two birds captured on 17 April were placed directly into a 'small' transfer box with food after being processed at 11:00 h. The birds were moved into a 'large' transfer box at 15:00 h, and

transported and housed in the same manner as the first two transfers.

Releases: Birds from the first transfer group were allowed to feed in transfer boxes for approximately 1 h from first light before being released. This protocol was modified after the first release (see Consequences). Honey water containers were removed from each transfer box prior to being driven by truck and all-terrain vehicle to the release site (10 min). Eleven birds from the first transfer group were released immediately following a brief release ceremony for local Māori iwi (tribe), media, Orokonui Ecosanctuary staff, volunteers and trustees. The remaining 24 birds from the first transfer group were released approximately 100 m further inside the sanctuary. The second and third transfer groups were released in the same general area as the first transfer group. The first and second transfer groups spent a maximum of 19 h in the transfer boxes, and the third transfer group spent a maximum of 21 h in the transfer boxes. These transfer times are within the maximum times for holding saddlebacks in transfer boxes (Pete McClelland, pers. comm.), but were relatively long for most transfers which are normally completed within one day.

Post-release monitoring: Fifty-one 5-9 h surveying trips were conducted along all active tracks (approximately 200 - 250 m apart) at Orokonui Ecosanctuary from two days after the initial release of 35 birds (18 April) until 7 October to determine the minimum number of birds that survived and remained in the sanctuary during the first 48 h after release. Post-release mortality or dispersal of translocated saddlebacks previously occurred within the first 24 h after release (Taylor & Jamieson 2007), as birds potentially circum to stress and an inability to find food and adequate roosting sites. Initially, walk-through surveys were conducted during the first 50 days after release. Playback calls had previously been shown to repel translocated North Island saddlebacks immediately after release (Raewyn Empson, pers. comm.) and

this method was therefore only used from 50 days after release. Pre-recorded calls were played every 200 m from a portable mp3 player and speaker during playback surveys to elicit a response from saddlebacks. When a bird was observed, its location, colour ring combination and behaviour was recorded.

CONSEQUENCES

Releases

First transfer group (35 birds): At 06:30 h the shade covers on all transfer boxes were lifted while the overhead garage lights were on. The birds immediately increased their movement within the boxes and although some were observed feeding and drinking, others hopped in and out of, and in four cases overturned honey water containers until the shade covers were replaced and honey water containers removed at 07:10 h (5 min before sunrise). The increased movement and spillage of honey water containers likely contributed to some birds becoming wet before their release.

All birds transported with perches in medium transfer boxes (9) and two birds transported in small transfer boxes without perches were released from the ceremonial site at 08:30 h. Nine birds appeared to be clean, dry and in 'good' condition, but one appeared to be wet, dishevelled and in 'poor' condition, and another in 'average' condition upon release. The corresponding colour ring combinations of released birds were not observed. The remaining 24 birds transferred in medium boxes (without perches) were released 100 m away from the ceremonial site at 09:30 h, and their general condition was opportunistically observed. Approximately 50% of the birds released in the second group flew away immediately, while the others appeared to be wet and dishevelled and only flew or hopped a short distance. Two birds were found dead inside the transfer boxes. A post-mortem report was inconclusive but indicated that the gastro-intestinal tract was empty of all ingesta in both, which suggests food was not

consumed during the final few hours and thus hypoglycaemia may have contributed to the deaths. The weather was fine and mild (warm) all day (18.1 °C maximum temperature).

Second transfer group (3 birds): The birds reacted while being checked with a dimmed torch light at 06:30 h, but settled immediately after the shade cover was replaced. The shade covers were removed at the release site at 07:05 h and the birds immediately began to move about inside the transfer boxes as daylight increased. The increased movements observed during the first and second releases suggested the birds were stressed, and thus they were released at sunrise (07:16 h). All three birds flew strongly out of the box and called during the first 15 min. The weather was fine, calm, and warm all day (20.9 °C maximum temperature).

Third transfer group (2 birds): The birds did not stir until a portion of the shade cloth was removed just prior to release at sunrise (07:17 h). Both birds appeared to be strong and dry as they flew off into the bush and immediately called. The weather was fine, calm and warm all day (15.5 °C maximum temperature).

Survival: A minimum of 79% (30/38) of released birds were resighted inside the sanctuary during the immediate post-release surveys, thus surviving the critical first 48 h after release. Of these, 83% (20/24) of birds transported in boxes without perches were resighted during the post-release surveys compared to 71% (10/14) of birds transported in boxes with perches. These numbers reflect the minimum number of birds that survived the release because unobserved birds may have left the sanctuary, may have died, or may not have been detected. Although the proportion of birds known to survive did not appear to be affected by the presence or absence of perches in their transfer boxes, the lack of perches does not follow best-practice for most passerines. All boxes were supposed to come equipped with perches, but boxes should have been checked before being used.

Discussion and recommendations: The combination of saddlebacks becoming wet with honey water and the lack of perches likely contributed to the deaths of two birds and to the poor condition of some others. We recommend two best-practice techniques are incorporated into future translocations of saddlebacks and other passerines: 1) transfer boxes holding birds should always remain covered with shade cloth, which will minimise stress of birds but still allow enough light for birds to feed; and 2) open containers of liquid should be fastened or weighed down (e.g. using a flat stone), and plastic water bottles should be fastened securely inside transfer boxes. We subsequently learned that both of these methods had been used in previous passerine transfers but these methods were not widely known, which leads us to our final recommendation.

A collaborative, web-based translocation manual would be invaluable to familiarise translocation coordinators with best-practice techniques such as covering transfer boxes with shade cloth and weighing water containers. Published standard operating procedures are often directed at the general process and include little information on specific methodology involved (Robertson *et al.* 2006) and thus the use of best-practice techniques often relies on involving local experts. As a result, anecdotal knowledge and new information are either handed down by word-of-mouth or reported in difficult to access 'grey literature'. Other documents or scholarly work are typically too general (i.e. Armstrong & Craig 1995, Leech *et al.* 2007, Taylor & Jamieson 2007), while species-specific information tends to be limited to a few species. We suggest a 'wiki-type' translocation manual is created and managed by a resource management agency, such as New Zealand's Department of Conservation. Experienced managers have traditionally instigated translocations and are the most familiar with specific methodology and best-practice techniques. Furthermore, although community groups are now initiating and

conducting translocations, management agencies still approve and oversee reintroductions (Sutherland *et al.* in press).

Community groups are capable of organising and conducting translocations, but there is still a need for formal advisors with translocation experience to actively participate and have the authority to resolve nuances and problems that inevitably arise, especially for complicated and lengthy translocations. For our translocation, two Department of Conservation managers with many years experience with saddleback transfers had been arranged to participate and provide advice during the capture and transfer of this translocation, but were not present at the release site. Experienced advisors should have been requested to assist during the release stage, which would have prevented the shade covers from being lifted, which in turn may have prevented the birds from spilling water containers and becoming wet. The combination of a 'wiki-type' translocation manual with best-practice techniques and formal advisors available during each translocation phase will increase the likelihood of a successful translocation.

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