

Translocation of the Seychelles warbler *Acrocephalus sechellensis* to establish a new population on Denis Island, Seychelles

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SUMMARY

In May–June 2004, 58 adult Seychelles warblers *Acrocephalus sechellensis* were translocated to Denis Island. The first pairs started nest-building within three days of release. By August 2005, their numbers had increased to 75. Of the 35 breeding territory vacancies created by the translocation on the source island of Cousin, all but three were occupied within an average of 5.4 days, by sub-ordinate birds.

BACKGROUND

The Seychelles warbler *Acrocephalus sechellensis* is an insectivorous species of thick scrub habitat and dense tall woodland dominated by *Pisonia grandis*. Males and females form long term pair bonds and defend a territory year round. There is a main breeding season from June to August and minor breeding season from December to February.

The Seychelles warbler is one of eight endangered endemic bird species in the Seychelles. It is listed as ‘Vulnerable’ on the basis of its very small range: only 120-ha over three islands (Cousin, Cousine and Aride). In 1968, the population was less than 30 individuals on one island (Cousin Island) but, in response to careful management and conservation policies, has grown to over 2,000 birds. These policies have included the cessation of intensive management of coconut *Cocos nucifera* plantations on Cousin, the active regeneration of the native broadleaved forests and the translocation of birds to nearby islands free from introduced predators such as rats *Rattus* spp. and cats *Felis catus*).

The new populations on Aride and Cousine are close to their carrying capacity, while the original population on Cousin Island has no potential for further growth. In order to improve the conservation status of the Seychelles warbler the establishment of a total of five separate populations with the potential to hold over 5,000 birds was deemed desirable.

At such a point the species could be considered for down listing from ‘Vulnerable’ to ‘Near-threatened’ (Richardson 2001). After extensive survey and habitat restoration work by Nature Seychelles it was decided to try to establish a fourth breeding population on Denis Island.

ACTION

Study site: Although Denis Island is outside of the known natural range of the Seychelles warbler, it was considered a suitable island for translocation for a number of reasons:

1) It is predator free – cats and rats were eradicated on Denis in 2000. However re-invasion occurred, leading to a more successful programme along with re-invasion mitigation measures which were implemented in 2002, as part of a conservation programme implemented by Nature Seychelles (Shah 2001; Hill *et al.* 2006).

2) The habitat is suitable - in 2001, dense strands of coconut were removed by Nature Seychelles and native trees were planted to supplement existing *Terminalia* forests. Now there are at least 30-ha of forest habitat dominated by native broad-leaved species including *Terminalia* and *Pisonia*, as well as extensive areas of former plantation now dominated by coconut and *Morinda*.

3) Food is suitable - sufficient insect prey, which the Seychelles warbler gleans from the

leaves of plants, such as *Pisonia* and *Morinda*, is available.

4) It contained compatible avian communities.

Capture: In late May/early June 2004, 58 adult Seychelles warblers (27 females and 31 males) were captured on Cousin Island in order to establish a new population on Denis. Of these, 35 were moved on the 29 and 30 May. After two weeks of monitoring to ensure survival, a further 23 birds were translocated on the 12 June 2004.

Cousin was chosen as the source as its warbler population is at carrying capacity (around 350 birds), and many territories not only contain a dominant breeding pair, but also subordinate individuals which remain on their natal territory due to the limited availability of good quality territories elsewhere on the island. This is also the original extant population and therefore contains the maximum genetic variation possible for this species. Furthermore, as the majority (>95%) of birds here were already ringed (using combinations of three colour rings and a British Trust for Ornithology metal ring) the identity, age and sex of all birds could be identified prior to translocation.

Birds were captured one month before the breeding season, considered the optimal time for the bird's health (based on individual mass). Having the highest pre-catching weight possible was important to mitigate any weight lost during the short time in captivity or due to the effects of stress in their new environment. Subordinate individuals were targeted for two reasons. Firstly, as they were young, they might contribute towards the population on Denis Island for longer. Secondly, taking subordinates would minimise disruption to the Cousin Island breeding population.

Warblers were allowed to feed for an hour in the morning before capture was attempted (starting at approx. 07:30 h) so they would have sufficient food to sustain themselves during translocation. Birds were captured using playback of song to lure them into mist nets. Using four teams of two people, birds were caught until approximately 11:00 h at which point they were translocated to Denis. The timing of the translocation meant that the birds could be transported, released and still have time to settle and feed before nightfall.

Translocation: Once captured, birds were weighed, identified based on their rings, and

faded colour rings were replaced if necessary. Prior to release, birds were kept individually in small cardboard boxes containing food (termite eggs), water and a perch. The birds were then moved to Denis by helicopter. Most (50) of the birds were captured between 07:30-11:00 hrs and translocated the same morning. However, eight captured during the preceding evening were kept overnight in a cardboard box and released the next morning.

Release: Once on Denis, the warblers were each weighed and then released in the middle of the island, where the vegetation is richest. Vegetation at the release site had earlier been sprayed with water to provide drinking water.

Monitoring: Full time monitoring (by two people) took place on Denis for two weeks between the translocation events and for three weeks after. Similarly, a three-week period of monitoring was undertaken on Cousin Island after the translocation to assess the impact of the removal of 17% (58/350) of this population. Monitoring continued on both islands until September 2004, and again from June to September in 2005.

Two methods were used for monitoring:

i) Population size and status: Birds were caught in mist nets (adults) or in the nest (nestlings). If birds had not been ringed, a BTO ring and a unique combination of three colour rings were attached. Basic morphometric measurements were taken (wing length, tarsus length, head length, cloaca size, and weight) and a blood sample was taken for molecular sexing, hormone and DNA analyses. If birds defecated, the faeces were collected for parasite analyses. No birds were harmed during the capture and all were released or put back in the nest.

ii) Territories and breeding status: Birds were attracted by whistling and 'pishing' (blowing harshly between ones lips to produce a scolding sound) or using playback of song (on Denis) every 15 m along paths and within the forest - 15 m is the average distance between centres of adjacent Seychelles warbler territories. Using these techniques, birds are attracted to the observer and will sing or alarm call. Birds were also located by listening for song or distinctive 'snapping' of their bills during foraging. Most birds were followed for a minimum of 15 minutes in order to determine breeding status, territory and to locate any additional birds associating with them. The exact territories were determined

using GPS and checking the territory multiple times. This monitoring was also conducted on Cousin Island before and after the capture of birds for translocation.

CONSEQUENCES

Territory occupation and status on Cousin Island after translocation: On Cousin, a total of 35 breeder vacancies were created after the translocation. Of these vacancies, 24 were occupied by subordinate birds from nearby territories, three were 'inherited' by resident subordinates and two remained empty. Three territories from which both breeders had been removed were taken over by neighbouring birds. Most vacancies were occupied within a few days of the removal of a breeder (mean $5.38 \pm SE 1.33$ days, range 1-20 days).

Fewer breeding attempts were observed in 2004 on Cousin than in 2003. This could have been partially due to the disturbances caused by the translocation of a relatively large proportion of the population (17%), but more likely, a consequence of the scarcity of rain that occurred during that particular season. The very dry conditions resulted in many trees losing their leaves, a considerable loss of leaf cover and a significant decrease in insect numbers.

Territory occupation and status on Denis Island after translocation: On Denis the first pairs started nest building within three days of translocation. In total, 20 territories were located of which 15 attempted breeding. Eighteen birds were recaptured and four nestlings were ringed. Birds that had not yet settled as breeders were observed as 'floaters' flying around the whole island probably in search of a mate or a suitable territory. New territories were still being established as late as September.

Territory occupation and status on Cousin Island in 2005: On Cousin a total of 159 birds were caught with mist nets and 41 chicks were ringed in the nest. Of these, 48 were caught for the first time, 39 having fledged after January 2005. Of these 39, 20 were still begging for food at the time of capture and were, therefore, younger than three months, while the other 19 were between 3-6 months of age. The remaining nine unringed birds were subadults and had fledged at least one year prior to capture. At least six individuals that must also have fledged after January 2005 remained

uncaptured. Thus a minimum of 45 individuals had fledged since the last visit in January 2005. This is an extraordinarily high number of fledglings for the minor breeding period (December-February).

During June to September 2005 most pairs nested again, often resulting in there being a begging fledgling around while the female was already incubating at a new nest. This extremely high breeding activity is suspected to be a reaction to the translocation in 2004. When Cousin was left by researchers on the 12 September, the warbler population consisted of 371 birds in total, of which 322 were independent (no longer fed by their parents or siblings). After only one year, the number of warblers on Cousin had already risen to that prior to the Denis translocation.

Territory occupation and status on Denis Island in 2005: The total number of territories on Denis in 2005 was 34, of these nine consisting of a single male only. In 2004 all territories were confined to the area south of the airstrip. However, in 2005, five new territories were formed north of it.

In 2005, 33 birds were caught with mist nets and four nestlings were ringed. Of the 33 birds caught with nets, 29 were young unringed birds reared on Denis. Of these, 10 were subadults approximately 8-12 months old and 19 were juveniles younger than eight months. In the beginning of August 2005, the total number of warblers was 75 (a 30% increase subsequent to translocation).

Conclusions: The translocation of the Seychelles warbler from Cousin Island to Denis Island was a success. After only one year after removing 17% of the population on Cousin, the number of warblers had recovered. One year after the translocation to Denis Island, the warblers had successfully established and the population increased by 30% to 75 individuals. Monitoring is ongoing.

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