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Conservation of kakerori (*Pomarea dimidiata*)

Report on overseas travel to Rarotonga, August 1997

by

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Summary

The Department of Conservation has assisted the Cook Islands Conservation/Environment Service, and more recently the Takitumu Conservation Area Project, to plan and implement a recovery programme for the endangered endemic forest bird, the kakerori, or Rarotonga flycatcher (*Pomerea dimidiata*). In November 1995, I received a grant of \$32,000 from the Pacific Development and Conservation Trust (PDCT) to help implement the Kakerori Recovery Programme and get the programme to the stage where it is self-sufficient. In 1996, the 150 ha area of southern Rarotonga which is occupied by kakerori was adopted by the South Pacific Regional Environment Programme (SPREP) as a Conservation Area as part of its South Pacific Biodiversity Conservation Programme. Management of the area has been passed from the Environment Service to the Takitumu Conservation Area Project (TCAP). The aim of the project is to manage the area as a conservation area in which ecotourism will generate income for the local landowners.

In 1989, the kakerori was classified as 'critically endangered' (Collar *et al.* 1994) as the population had declined to just 29 birds because of nest predation by rats. Between 8 and 29 August 1997, I worked with Anna Tiraa and Ed Saul of the TCAP to carry out a population census, colour-band as many young kakerori as possible, plan the field programme, and liaise with the landowners who run the conservation area project.

The population of kakerori had increased from 139 birds in 1996 to at least 148 birds in 1997, a five-fold increase over the numbers when intensive rat control began in 1989. Annual survivorship in was again very high at 91%, with most losses being of subadults (aged 1-3 years). We colour-banded 10 birds, bringing the total individually marked to 104 (70% of all birds).

I recommended modifications to the recovery programme to reduce costs of labour and to decrease the use of poison baits. In 1997/98 we again compared the effectiveness of 'Philproof' bait hoppers with the traditional plastic tube bait-stations and found that rats largely ignored the hoppers, as they had done in We found that 'tropical Talon WE350 baits (from Garrard's Pesticides Ltd in Australia) were more durable but much less palatable than standard Talon WB50 baits (from ICI Crop Care in New Zealand). Water samples collected towards the end of the poisoning season from the four valleys contained no detectable brodifacoum.

I attended two meetings of the Takitumu Conservation Area Project Committee (landowners) and discussed options for managing the conservation area, with the view to developing a sustainable income for the landowners derived from ecotourism.

I recommend continued involvement in this very successful conservation programme, which has not only helped to conserve the kakerori, but which can be used as a model for tackling similar conservation problems in New Zealand and elsewhere in the Pacific. This project also provides a model for community involvement in the sustainable development of a conservation area, and much interest in the Pacific is focused on its success to date.

1. Background

In a review of the bird conservation problems in the South Pacific, commissioned by SPREP and ICBP in the early Rod Hay identified the kakerori as one of the species most urgently in need of conservation management (Robertson *et al.* 1994). This small flycatcher, which is endemic to Rarotonga, was critically at risk of extinction.

As a result of a study between September 1987 and January 1988, Rod Hay and Hugh Robertson reported to the Cook Islands Conservation Service (CICS) and SPREP that ship rats were having a very detrimental effect on the breeding of kakerori, and that cats were likely to be predators of recently fledged juveniles and adult birds. The report provided a draft plan for the recovery of the kakerori, with recommendations on a cost-effective recovery programme and scientific study aimed at assessing the effectiveness of this work.

The draft recovery plan was adopted by the CICS and SPREP (Project PA 12) in July 1988, to be implemented by DSIR Ecology, the CICS and SPREP. Subsequently, both Hugh Robertson and Rod Hay, shifted from DSIR to the Department of Conservation. The Department has continued to provide some support to Hugh Robertson for the ongoing field and education programme.

The original objectives of the recovery plan were:

1. To monitor, on an annual basis, the dynamics of the kakerori population on Rarotonga.
2. To research, develop and implement an effective predator (rat and feral cat) control programme; this would include an assessment of rat populations in relation to kakerori distribution.
3. To research, develop and implement, where appropriate, a programme of managing the kakerori population by protecting nests, providing supplementary food, and as a last resort by translocation or captive breeding.
4. To describe the habitats used by kakerori, and determine the relationship between habitat features and the distribution of kakerori.
5. To develop and implement a programme of public education, awareness and participation, where appropriate, in the kakerori conservation programme.
6. To encourage the protection of the kakerori, by creating a suitable reserve, and developing appropriate national and international policies regarding scientific collection or trade in kakerori, and the importation of wildlife (and hence potential diseases) into the Cook Islands.

Our 'unofficial' aim was to have over 100 birds by the year 2000.

The Kakerori Recovery Plan was updated in 1995 in an Environment Service document 'Towards 2000: a management plan for the kakerori's next 5 years' written by Ed Saul. This re-affirmed the above aims, but expanded on aim (3) by promoting a feasibility study into the possibility of translocating kakerori to another island in the southern Cooks which is free of ship rats (e.g. Aitutaki or Atiu).

In 1996, SPREP adopted a joint proposal from the new Ministry of Works, Environment and Physical Planning of the Cook Islands government and the Takitumu Conservation Area Co-ordinating Committee (representatives of the three customary landowning families involved) that a 155 ha area of the southern part of Rarotonga, which is the home of the kakerori, be adopted as a Conservation Area as part of the South Pacific Biodiversity Conservation Programme. The goal of the project on the Takitumu Area (TCA) is 'to conserve the Conservation Area's biodiversity for the benefit and enjoyment of present and future generations on Rarotonga'. More immediate objectives are:

1. To develop partnership arrangements between government, landowners, NGOs, and others for effective management and sustainable use of biodiversity in the TCA.
2. To develop and implement management plans for the wise management and use of biodiversity with the TCA.
3. Raise public awareness about the importance of and means for conservation of biodiversity in the TCA.
4. Promote, implement and support sustainable economic activities by communities associated with the TCA.
5. Develop, as appropriate, a model for the implementation of Conservation Areas in other parts of Rarotonga and the Cook Islands.

The project is expected to run for 5 years, and has been funded by for the first three years. Anna Tiraa, formerly with the Environment Service, has been appointed as the Conservation Area support officer, and Ed Saul, formerly a conservation volunteer and part-time staff member of the Environment Service, has been appointed as the part-time technical advisor to the project. Both appointees have been involved in the Kakerori Recovery Programme since 1989.

At least two other temporary staff have been employed on the Kakerori Recovery Programme and TCA project this summer from TCA monies and from the Pacific Development and Conservation Trust grant that I received.

2. Implementation and results: 1987-1996

In 1987 the kakerori population stood at 38 birds, but it fell to 36 in 1988, and to 29 in 1989, and at that rate of population decline, a population viability analysis showed that there was a 50% chance that kakerori would be extinct by 1998. An intensive programme of rat poisoning and nest protection began in spring 1989, and the kakerori population had recovered to 139 birds in 1996.

3. Aims of 1997 visit

The aims of my visit in August-September 1997 were to carry out a detailed breeding season population assessment, to colour-band as many birds as possible to aid with the annual 'roll-call' of birds, to help design the 1997-98 field programme which is being done by staff of the Takitumu Conservation Area Project, to discuss the long-term sustainable development of the Takitumu Conservation Area as part of South Pacific Biodiversity Conservation Programme, and to train local staff in field techniques.

4. Results

The Kakerori Recovery Programme was again very successful in 1996/97 with a minimum of 21 yearlings being recruited into the population. Although this figure was down on the previous year (a record 38 yearlings), it was sufficient to help the population increase from 139 birds to 148, a 6% increase. Only 2 (3.7%) out of 54 grey birds (4+ years old) could not be found (assumed dead), but 12% of birds (1-3 years old) had disappeared-see Robertson *et al.* (1983) for the method of ageing kakerori. The overall adult survivorship remains outstandingly high, with 22 of the 29 birds alive in spring 1989 still alive in spring 1997, and three grey birds banded by Rod Hay and Gerald in 1984 are at least 17 years old! This study has confirmed that some birds in the tropical and temperate southern hemisphere (including New Zealand) have quite life-history strategies than those in the northern hemisphere, where most ecological theory has developed.

The census is becoming more difficult and time-consuming as the population has increased; however, we are lucky that the range of the birds has increased only marginally since 1989. Ed Saul, Anna Tiraa and I mist-netted and banded seven of the 21 yearlings plus three older birds (including an 11 year old female that has eluded our netting attempts since 1987!). This brought the number of colour-banded birds to 104 (70%) of the 148 birds, which enables the annual roll-call and census to be very accurate. We experienced considerable problems with a malfunctioning amplifier and speaker system, and this hampered our efforts to catch more birds.

I attended two meetings of the Takitumu Conservation Area Project Coordinating Committee (landowners) as a scientific advisor to the committee. We discussed options for the long-term community management of the conservation area, with the view to develop a sustainable income for the landowners derived from ecotourism. I provided some advice on how to market the operation to birdwatchers and naturalists, and on a charging mechanism for specialist ecotourists (twitchers/listers) who wish to see particular bird species. I encouraged the project to take part in International's annual bird count as a way of increasing the profile of the project in the Cook Islands and overseas. The main attraction to international

tourists will undoubtedly be the kakerori and its management programme, but the area also hosts breeding populations of the other three species of native and four of the six species of seabird on Rarotonga, a fruit-bat colony, and several rare shrubs and orchids.

We mapped the distribution and numbers of the rare orchid, which was flowering during my visit, and planned methods for carrying out other resource surveys as required as part of the SPBCP.

I helped to design three field experiments aimed at refining or validating the rat poisoning programme: a test of bait-hoppers versus bait tubes, a test of tropical formulation Talon versus standard Talon, and the collection of water samples to see if waterways are being contaminated by the rat poisoning programme.

In 1996/1997, we conducted an experiment by putting rat poison baits into 'Philproof' bait-hoppers in one of the four valleys occupied by kakerori, but bait-take was remarkably low (Robertson *et al.* 1998). We decided to repeat this test in and again found that bait-take was very low compared with our usual plastic tunnel bait stations. We conclude that 'Philproof' bait stations (as used widely by the Department of Conservation) are ineffective for controlling rats in the absence of possums. They may prove to be more effective on the New Zealand mainland if rats are attracted to baits that possums have dislodged or dropped, but they are clearly not suitable for Department of Conservation to use on possum-free offshore islands.

Over the years we have had problems with poison baits becoming mouldy and hence unattractive to rats (see Robertson *et al.* 1998). In we obtained 100 kg of tropical formulation Talon WB50 baits from Pesticides Pty Ltd in Australia. We tested their persistence and palatability by placing these baits and normal Talon WB50 baits in alternate bait stations in the Turoa Valley. Because the tropical baits were much more expensive than normal baits we delayed the start of the experiment until midway through the poisoning season once bait take had dropped to less than about 20% each week. The baits lasted significantly longer than normal baits, but were significantly less palatable. Rats sometimes took normal baits from alternate stations, leaving the tropical baits untouched in the middle. We assume that the chemical used for suppressing mould growth is distasteful to rats. Given the greater price of the tropical product, the greater persistence does not make up for the lower palatability, especially in situations where the aim is to eradicate rats from an island (e.g. Raoul Island in the Kermadecs) or to reduce rats numbers to an acceptably low level for conservation gains to be made (e.g. in the Takitumu Conservation Area).

In December 1997, we collected a water sample from each of the four streams draining the valleys in which we poisoned rats from September onwards. These samples were analysed by the National Chemical Residue Laboratory at Wallaceville, Upper Hutt and found to contain no traces of brodifacoum at the detection limit of 0.2 parts per billion (i.e., <0.0002 mg/litre). It therefore appears that there is minimal risk of contamination of waterways from the level of bait application used in our project.

Since returning to New Zealand I have supplied information and diagrams on the Kakerori Recovery Programme for use in educational material put out by the Takitumu Conservation Area Project and for use in the interpretation centre in the Turoa Valley. I have also been working on several scientific papers stemming from this work, one of which was published recently in *Ecological Management* (Robertson *et al.* 1998).

5. The future

The aim of building kakerori numbers up to 100 by the end of the century has already been achieved and we are now aiming at 200 birds by 2000. Continued population growth seems assured with the injection of support to the project from the Pacific Development and Conservation Trust and from SPREP, at least until the end of the season. We will be applying to the IUCN (through BirdLife International) to downgrade the threatened status of kakerori from 'critically endangered' to 'endangered'.

We are still trying to refine the ongoing rat control programme, mainly through experiments aimed at minimising the amount of poison put into the environment each year.

The Takitumu Conservation Area Project, as a community based and ecologically sustainable conservation venture, is very exciting, and could provide a good model for the integrated management of ecotourism and biodiversity conservation in the South Pacific. The continuing success of the Kakerori Recovery Programme provides a firm basis for attracting tourists to an accessible and biologically interesting experiment.

6. Acknowledgements

Many thanks to Anna Tiraa and Ed Saul for their great help throughout my visit. Ed Saul and Maddie Midwinter again provided warm hospitality during my stay. The Pacific Development and Conservation Trust paid for my travel expenses this year, and the Department of Conservation allowed me 15 days of paid leave during the 21 days I was in Rarotonga.

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