Conservation of the Tahiti flycatcher *(Pomarea nigra)*

Report on advice provided to Societe d' Ornithologie de Polynesie

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1. Introduction

The Tahiti flycatcher *(Pomarea nigra)* is one of several monarch flycatcher species in the Polynesian genus *Pomarea,* all of which are threatened. The Tahiti flycatcher is currently known from only the western side of Tahiti where, during the 1998-99 season, at least 24 individuals, including 10 pairs, were located in four valleys (Blanvillain 1999). Although ten nests were protected from rats in 1998-99, only three were successful in fledging young. Two of these young apparently disappeared one week after fledging and the third, two months after fledging (Blanvillain 1999). Concern was raised about the possible predation by common myna *(Acridotheres tristis)*, and/or red-vented bulbul *(Pycnonotus cafer)* on juveniles.

In 1999-2000 the Societe d'Ornithologie de Polynesie (MANU) was granted funding for Tahiti flycatcher conservation by the South Pacific Regional Environment Programme (SPREP). During 13-26 September 1999, RP visited Tahiti to advise and help CB with aspects of the programme. This advisory work was funded by the N.Z. Ornithological Congress Trust Board (ICBP). It builds on work by Gaze & Blanvillain (1998) funded by the Pacific Development and Conservation Trust.

2. Situation in September 1999

2.1 FLYCATCHER BREEDING

In the 1999 breeding season, eight pairs had been located by CB in four valleys. (Note: no details of breeding sites and specific data are provided in this report for reasons of security and data ownership.) Nests of the Tahiti flycatcher had been found in July, August and September 1998, cf. late September-October onwards in 1998 (CB pers. comm.) and in all years for the kakerori *P. dimidiata* (H Robertson, pers. comm.).

This early nesting put some pressure on nest protection work early in the 1999 season.

2.2 BREEDING HABITAT

Known breeding habitat is confined to spectacular deeply-entrenched valleys on the west side of Tahiti. Typical sites had cliffs of 100-200 m towering overhead. The forest was dominated by the invasive African tulip tree *(Spathodea campanulata)*, growing on cliffs, hillslopes and riverbeds. Few other tree species, e.g. *Aleurites*, were present, but one, the mara *(Neonauclea forsteri)* is the centre of flycatcher activity and the preferred nest site. The understorey was dominated by king fern *(Marattia salicina)* and giant taro *(Alocasia macrorrhiza)*.

2.3 NEST PROTECTION

Nest protection in 1998 had comprised a combination of tree banding (aluminium sheets) and rat poisoning. The poisoning entailed bait station lines at right angles to the main valley, with 20-40 m between lines and 15-30 m between stations within lines.

At each station, a plastic tube 30 cm long and c. 8 cm diameter was filled with up to four plastic sachets, each containing 100 g bromadiolone-coated wheat. In one valley containing poultry and other livestock, sachets were fastened inside the tubes to minimise non-target risks.

The system of banding and poisoning on this regime worked well in 1998, and was being reinstated in 1999.

3. Work and advice provided - September 1999

3.1 RAT CONTROL

In mid-September, rat control was already under way in Valley A, and was extended to include valleys B and D, where nesting was recently under way. Methods broadly followed those of 1998, i.e. control was focused on individual territories and extended for up to 50-200 m upstream and downstream of nests. Stations were put out at 30-40 m intervals along the river lengths, usually paired (i.e. opposite sides of stream covered). In some cases where the valley was broader, three or four stations were put out at c. 30 m intervals running at right angles to the stream.

In each station we placed four sachets of poison bait, and checked and replenished any consumed sachets twice weekly. Bait take was moderate or high during the second week of poisoning. Poison bait sachets contained 100 g 0.005% bromodiolone-coated wheat. This presentation method overcame some of the problems of bait deterioration and reduced palatability experienced in Rarotonga (Robertson et al. 1998). Details of the baiting regime and bait replacement rates are contained in Blanvillain et al. (1999).

There are some potential improvements that could be made to this regime.

Timing

At least one month of rat control should be allowed to achieve effective control. It was planned to initiate poisoning in August-September 1999, but funding circumstances precluded this. Considering the early nests of 1999, it would be advisable to initiate control by late July-August next year.

Valley v territory control

It was planned to undertake territory-focused control in Valley C in 1999 which necessitated locating nests. In 2000, it would be useful to set up control in this valley as a continuous regime covering c. 1500 m of river length to give effective control to all pairs. Such control would give some protection to any nests that had not been located by field workers, a likely scenario in this more isolated valley.

Vertical extent of control

Currently, control occurs only on the valley floor, the assumption being that rats occur only on the valley floor and not on the steeper hills and cliffs. A bait station located on a near vertical slope in September 1999, however, had its baits (six sachets) removed within six days, indicating rats were present in these sites. This presents a significant threat to nests located in trees above the valley floor. The only efficient way of getting poison to these sites is by throwing or catapulting sachets into position. Density of sachets should be similar to the successful coverage of the valley floor.

Fledged young are sometimes escorted to higher altitude by the adults. These higher sites will be outside the effective rat control regime, so if night-time roosting also occurs at those higher sites, then the fledglings might be placed at increased risk. In Rarotonga, however, there is almost 100% survival of fledglings in the presence of rats, and poor survival in recent years has been attributed to specific periods of bad weather (H. Robertson pers. comm.), so this may not be an issue.

Fastening sachets to tunnels

In most valleys, sachets are simply placed in tunnels. During September 1999, many unfastened sachets were totally removed by rats (presumably *Rattus rattus*) and two were found cached in tree holes c. 1.5 m off the ground. It is not known whether this bait removal would alter the rate of rat knockdown, but it is unlikely to be significant (J. Innes pers. comm.).

Currently, sachets are fastened inside tunnels in areas where there are livestock and poultry present.

In those stations that do require fastening of sachets for livestock precautions, fastening could be by constriction around the middle of the sachet rather than piercing the plastic with wire. This would allow for better bait longevity.

One other advantage of fastening sachets would be in lessening the amount of plastic litter in each valley, if this was perceived to be a local issue. Since water is drawn from most catchments lower down the valleys, old plastic poison sachets could possibly raise concerns.

However, the immediate priority should be to arrive at an efficient and practical means of rat control, thereby increasing flycatcher productivity. When this is achieved at a consistent level, the present technique and quantity of bait provided should be reviewed. In New Zealand, for example, efficient ship rat control has recently been achieved with the first-generation anticoagulant warfarin and on 50 x 100 m grids.

Data sheets

A data sheet for recording poison data was drafted.

3.2 RAT MONITORING

Currently, rats are indexed within a pair's territory before and after poisoning to gauge efficiency of regime. Post-poisoning indices in 1998 (Gaze 1999) indicated low rat numbers. Pre-poisoning indices in September 1999 in one territory indicated high numbers of rats, viz 20 traps for two nights, 4 m apart, under natural cover, baited with coconut, yielded seven rats - five *Rattus rattus* and two *R. exulans,* for a corrected trap night index of 23%, but for only 30 trap nights.

This method provides a general picture of rat abundance, but can be biased according to what part of the territory, and especially habitat type, is selected. For example sites around rocks and fruiting trees are likely to produce very high rat captures.

In the future, it would be prudent to set up a permanent rat monitoring index line in at least two valleys, e.g. C and D. Lines should be standardised, e.g. 40 permanent trap sites, three nights, 50 m between stations. This will provide a statistically more robust assessment of rat abundance within valleys and under different management regimes. This will become a crucial measure if questions of bait aversion, etc. arise, with consideration of alternative rat control methods. If the increased work and budget is a problem, omitting the pre-poison assessment is an option.

Another option is to set up tracking tunnels, which are easier to operate than traps, but data on rat species and demographics are lost.

Rats had been controlled to very low levels in the bottom of the valleys in 1998, as evidenced by low bait take and low snap-trap monitoring returns in that year. The question of rat abundance and threats on the valley slopes arose in this 1999 trip, firstly in regard to a nest high up on a cliff and secondly the behaviour of bird families (with fledged young) going to higher elevations.

In 2000, it would be very useful to compare the relative abundance of rats in the valley floors and on steep slopes before and after valley control. This would allow for better-informed decisions on the need for more extensive rat control.

3.3 TREE BANDING

Treebanding, in conjunction with poisoning, worked well for Tahiti flycatcher in 1998 and early 1999. Banding by itself is unlikely to achieve significantly improved breeding success because of the agility of some individual rats. Used in conjunction with rat control, however, it will significantly improve breeding success.

As with the kakerori, it is advisable that trees not be banded until incubation has started, and if birds are shy, choose the most tolerant individual's incubation bout (H. Robertson pers. comm.). Hammer noise can be muffled by a cloth being placed over the nail head.

3.4 BIRD PESTS - SHOULD THEY BE CONTROLLED?

Mynas, red-vented bulbuls and Australasian harriers *(Circus approximans)* are considered potential predators of Tahiti flycatchers or their nests or young (Blanvillain 1999). During 1998-99, several interactions with mynas and bulbuls had been seen during the nesting and post-fledging periods, and two juvenile flycatchers disappeared (Blanvillain 1999). These interactions were primarily initiated by the flycatchers (C. Blanvillain pers. comm.).

Should these predatory birds be controlled? Currently, there seems to be inconclusive evidence as to whether these birds are significant predators of the Tahiti flycatcher. For example, in 1999, two juveniles have fledged to late September, but no interspecific interactions were observed in September 1999. In New Zealand, rats and other predatory mammals are more impacting than mynas on native birds. For instance, predator control in one "mainland island" site has been accompanied by increases in myna numbers along with numbers of several native species (Anon. 1999).

Considering this, and the difficulty of undertaking bird control, it may be more useful to re-assess the situation at the conclusion of the 1999-2000 breeding season. The relative abundance of mynas and bulbuls varies between valleys, and lends itself to a research by management approach. In two of the valleys, mynas and bulbuls are common, whereas, in the other two they are rare. If the flycatchers double-brood this year, there should be a reasonable data set available for evaluation in 2000.

If control of mynas and bulbuls is warranted, current work in New Zealand with poisons and traps for mynas will provide some useful guidance.

One other potential predator (of nestlings) is the Tahiti kingfisher *(Halcyon tahitiensis),* territories of which overlap with most of the flycatcher territories, but there are no data on its diet or impact. Similar-sized kingfisher species elsewhere are known to include small birds, especially nestlings, in their diet.

3.5 BIRD OBSERVATIONS

In-depth knowledge of flycatcher behaviour is being gained by CB and others. A daily data sheet was drafted to enable temporary participants to contribute in a standardised and more useful format.

3.6 BIRD SURVEY

There are several valleys and tributaries that could harbour additional flycatcher populations. There are few locals who can undertake more extensive survey, so additional survey would need to be budgeted for. Gaze & Blanvillain (1998) found taped playback to be an effective survey method. During my visit, I found that climbing to observation points above the forest was also an effective survey method that complements surveying from the valley floor. The flycatchers spend much time in and above the canopy, both in feeding and territorial behaviour, and elevated survey points afford extensive and quieter conditions than in the valley. Ideally, observers should be located at two or more points to ensure simultaneous coverage of "difficult" sites.

3.7 BIRD BANDING

This was begun by Peter Gaze in 1998, and continued by MANU members. It assists in pair recognition and therefore saves valuable field time. It is advisable to band birds outside the breeding season to avoid disrupting nesting pairs. Conspicuous colours are needed for ease of recognition in those dark canyons!

3.8 CAPTIVE BREEDING

This had been considered an option for the current year's programme, particularly when it was thought that several pairs had disappeared since 1998. Now that the "missing" pairs are relocated, the immediate need to consider captive breeding is lessened. Future decisions on a captive breeding programme need to take into account adult survival, recruitment of young, and causes of death of juveniles (the predatory bird question), as well as the high risk of captive breeding.

3.9 TRANSLOCATIONS

Currently there is no evidence of birds moving between valleys. If this apparent isolation proves to be real, consideration should be given to inter-valley translocations in the future. However, I recommend that this should only be considered as a course of action if a valley's resident population drops below two pairs (each valley presently contains 2+ pairs). Recipient valleys should only be considered if they have significant unoccupied habitat, e.g. valleys B and C would appear to have suitable unutilised habitat.

3.10 CHANGING FOREST STRUCTURE

The African tulip tree is an aggressive coloniser and is rapidly changing the structure and ecology of Tahiti's forests. There is a clear need to find ways of controlling this species and other invasive plant pests.

3.11 FUNDING AND ADVICE

The Tahiti flycatcher programme requires a financial commitment for several years to bring this species back from the brink of extinction. SPREP have committed funding for this programme for the next three years (G Sherley pers. comm.).

Tahiti and French Polynesia have a number of conservation issues which are not being adequately addressed, owing to lack of technical capability and funding. For threatened species there is a need for basic recovery planning and assistance with bids aimed at securing national and international funding. There is a need for assistance in public awareness programmes, e.g. the production of posters and brochures for the likes of the flycatcher programme. The New Zealand Department of Conservation should be playing a pivotal role in providing the technical and scientific advice needed in this and other conservation projects in the region. Indeed, the Department has a Memorandum of Understanding with SPREP for projects of this nature.

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