

Occupancy at two Rufous Scrub-bird territories in the Gloucester Tops

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This note reports the disappearance of two male Rufous Scrub-bird *Atrichornis rufescens* from their long-term occupied territories in the NSW Gloucester Tops and shows that there must not have been any other males waiting at those territories to replace the absent male.

The Rufous Scrub-bird is a cryptic near-flightless species with a restricted range. Locally it occurs in some high-altitude parts of the Barrington Tops National Park, such as the Gloucester Tops. There are four additional isolated populations in northern NSW and southern Queensland (Ferrier 1985; Newman *et al.* 2014). Most of our knowledge about the Rufous Scrub-bird derives from a study undertaken in the 1980s (Ferrier 1984; Ferrier 1985). Many unknowns remain. Often the gaps in knowledge about the Rufous Scrub-bird's behaviour and breeding biology are filled by extrapolating from what is known for the Noisy Scrub-bird *A. clamosus*, a species found in the south-west of Western Australia (e.g. see Garnett *et al.* 2011, p. 281). The Noisy Scrub-bird was thought extinct until a surviving small population was discovered in 1961 (Robinson & Smith 1976). Since then it has been well-studied, as part of an overall recovery plan.

The Noisy Scrub-bird breeds in winter, lays a single egg and the female's territory is located up to a kilometre from the male's territory (S. Comer pers. comm.). In contrast, the Rufous Scrub-bird breeds in spring and early summer, lays two eggs (typically) and the female's territory is on the edge of that of the male (Jackson 1921; Ferrier 1984; Higgins *et al.* 2001). These points suggest it is likely that there will be some other behavioural differences between the two species.

For the Noisy Scrub-bird there is an active translocation program in which males are removed from their original territory and released elsewhere. It has been found that there often are silent subordinate males within the territory of the dominant vocal male, and that a subordinate bird

will rapidly assume the dominant singing role when the original dominant male is removed (Berryman 2007). By extrapolation that situation might be expected to happen sometimes with the Rufous Scrub-bird. Obtaining evidence to support or contradict the scenario is not straightforward, because all male Rufous Scrub-birds look very similar and they all sound the same (based on our current knowledge). However, monitoring of the Gloucester Tops population has offered some insights, as outlined below.

A project to monitor Rufous Scrub-birds in a high-altitude area of the Gloucester Tops was initiated in 2010 (Newman *et al.* 2014). The focus has been to identify and monitor Rufous Scrub-bird territories; this is done by walking transects within an area of core habitat for them (at approximately 32.1°S, 151.6°E, see **Figure 1** for the locations of transects). Thirty-seven Rufous Scrub-bird territories were identified during surveys over 2010-2016, these being a mix of territories with short-term occupancy (1-2 years) and long-term (multiple year continuous) occupancy (Stuart & Newman 2018). A similar mix of short-term and long-term territory occupancy was found in the New England Region population (Andren 2016).

At two long-term occupied territories in the Gloucester Tops, the male Rufous Scrub-bird disappeared after several years of continuous presence. One territory (code name GT170R) was located about 2 km beyond the junction of Gloucester Tops Road and Kerripit Road. It was first identified as a territory in the 2010 surveys although anecdotally a scrub-bird had been present for some years prior to that. The territory was occupied throughout the 2010-2016 breeding seasons (i.e. it had long-term occupancy). The scrub-bird usually was within 20-50 m of the road. Because it called reliably, the bird was readily detected whenever a survey team passed by. The Recording Rate (RR) for this scrub-bird from the spring surveys over 2010-2016 was above 90% (i.e. the bird was detected in more than 90% of the

surveys). In 2016 I included the GT170R territory in a study of Rufous Scrub-bird singing behaviour (Stuart & O'Leary 2019) and made several multiple-day recordings there using an automated recording unit (ARU). The bird was singing well in November 2016 (ARU data showed that it had made 1,500-1,800 chipping calls per day). It was still present at the territory when I visited on 14 December 2016. However, the ARU recordings in February, March, August, September and October 2017, each spanning several days, contained no scrub-bird calls. After that I moved the ARU to another territory. Since then I have visited the GT170R site 3-4 times each breeding season and several other times during each year, usually for 20-minute periods. I have never heard any Rufous Scrub-bird calls in those visits. It seems that there was no subordinate male Rufous Scrub-bird waiting at or near the territory. Visual inspection of the habitat at the territory suggests that it is unchanged from its pre-2017 condition.

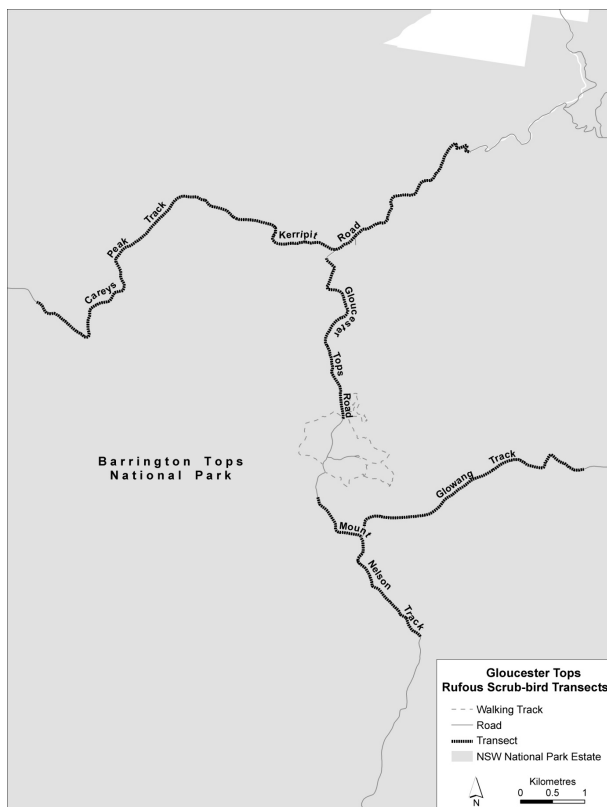


Figure 1. Rufous Scrub-birds survey transects in the Gloucester Tops (taken from Newman *et al.* 2014).

Another territory (code name KP316L) is near the junction of Gloucester Tops Road and Kerripit Road. A Rufous Scrub-bird disappeared from the territory for two breeding seasons. The KP316L territory was occupied throughout the 2010-2013 breeding seasons (i.e. it had long-term occupancy). The scrub-bird usually was within 50 m of the

road, and often it was less than 10 m from it. This bird called reliably and was often detected when a survey team passed by. The RR for this scrub-bird from the spring surveys over 2010-2013 was above 80%. However, in the 2014 and 2015 spring surveys, no Rufous Scrub-birds were detected. Surveyors did at least ten transects past the territory in that time. As the location is readily accessible, the transect-based surveys were supplemented by using stationary observers who listened for the bird for periods of 30-60 minutes at a time. In the breeding season it is very unusual for a Rufous Scrub-bird not to have called at least a few times during any hour of the day (Stuart & O'Leary 2019). Many hours (estimated at 8-10 hours) were invested over several days in the 2014 and 2015 breeding seasons waiting in vain to hear the scrub-bird call. I also did not hear the bird in my visits at other times during those years. It seems valid to conclude that the KP 316L territory was not occupied in 2014 and 2015.

In September 2016, I heard a Rufous Scrub-bird calling at that Gloucester Tops Road location and the bird was readily detected in the surveys carried out in October and November 2016. A scrub-bird has been present regularly ever since. The territory was confirmed to be occupied in the 2017 and 2018 breeding seasons. Since 2016, I have made numerous visits to the site outside of the breeding season as part of my study of Gloucester Tops Rufous Scrub-birds and I have seen or heard the bird many times during those visits. The ease of detection of the scrub-bird since 2016 is further evidence that there was no bird present in 2014-2015. There also is evidence which suggests a different scrub-bird now occupies the KP316L territory. The singing area is now centred 50-80 m further away from the road than appeared to be the case in 2010-2013, and also is approximately 50 m closer to the Kerripit Road junction. I have never encountered the post-2016 scrub-bird close to the road and it is sometimes *c.* 100 m from it. Rufous Scrub-bird singing areas are only about 1 ha in size (Stuart 2018) and the change in location of the singing area seems unusual if it was still the original bird.

A plausible scenario is that the original KP316L Rufous Scrub-bird died (or moved away) after the 2013 breeding season and that the territory was unoccupied for two seasons until a new scrub-bird moved in before the start of the 2016 breeding season. This therefore is a time marker that may lead to insights about how many years an individual male Rufous Scrub-bird defends a territory.

Many of the Rufous Scrub-bird territories that we have found in the Gloucester Tops have had short-term occupancy (Stuart & Newman 2018). The eventual disappearance of the scrub-bird from such a territory may be explained in various ways; for example the habitat may have been marginal or had become so, or the scrub-bird either did not succeed in attracting a mate or did not have breeding success. However, long-term occupied territories imply prime habitat and that the bird has had breeding success. Thus, the absence of any evidence for the presence of subordinate scrub-birds at two long-occupied territories in the Gloucester Tops indicates that young adult male Rufous Scrub-birds, at least sometimes, do not remain within the vicinity of a dominant male that is actively advertising his territory. This observation warrants further investigation.

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