BIRD BANDING REPORT FOR THE KUTINI-PAYAMU NATIONAL PARK, QLD: 2020 Visit

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Prepared for:
National Parks, Sports and Racing Department, Queensland Government

The most recent field visit was conducted under Australian Bird and Bat Banding Society Permit 2337, Scientific Permit WITK18603817 and under QLD DPI ethics CA 2018-02-1159.

01 January 2021

Citation

Coleman, Jonathan T. 2020. Bird Banding Report for the Kutini-Payamu National Park, QLD: 2020 Field Visit.

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Front Picture: Adult Yellow-billed Kingfisher *(Syma torotoro)*
Band No. K0-15052. Caught and Banded on 27 November 2020 Kutini-Payamu National Park.

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1.0 Executive Summary

Since 1990 birds have been regularly surveyed in the Kutini-Payamu National Park, a rare and unique lowland tropical rainforest habitat on the Cape York peninsula, Queensland. The climate is tropical with a marked dry and wet season and over the 30-year period of the study no significant difference in annual rainfall were recorded. However, there has been a slight increase in mean annual temperature since 1990 (Coleman 2019b).

Birds have been caught and banded, using standardised mist netting practises at a range of locations in the park, normally during the month of November to maximise the chances of surveying both resident and migratory species arriving ahead of the wet season. These locations have been visited consistently over the 30-year study period, allowing trends in catch rates, juvenile proportions and survival rates of a number of species to be established.

To date, including the 2020 visit, 5,988 birds of 63 species have been captured and banded as part of this study with 618 recaptures, a total number of 6,606 bird encounters and a mean recapture rate of 14% overall. All birds were aged using plumage characters and while the proportion of juveniles each year was variable, overall there was no significant increasing or decreasing trend recorded for any of the species regularly caught. Catch rates, and the relative proportions of species caught have also remained consistent overall, although variable between years throughout the study period. However, the catch rate in 2020 was significantly higher than in previous years, despite some commonly caught species being noticeably reduced in numbers in the overall catch.

Following the 2018 visit to the site Cyclone Trevor, a category three system caused significant damage to the rainforest sites regularly sampled as part of this study. The 2020 visit therefore provided an opportunity to potentially assess the impact of the storm on the local avifauna.

Assessments of the canopy in the study sites indicated severe damage with only 20-30% of sky coverage observed. Protected locations in riparian corridors and in the lee of higher ground by contrast were almost undamaged in some cases. Recaptures of previously banded birds were significantly lower than in previous years (7% of the overall catch) and there was a noticeable reduction in the numbers of White-faced Robin's caught. Damage to the forest canopy also meant birds generally higher in the canopy were encountered in the lower canopy with large numbers of Rainbow Lorikeets present, a number of which were caught and banded for the first time.

Whether the lack of recaptures reflects high mortality in the affected areas with new birds moving in, or displacement of the previous birds is unknown and will require further investigation in the next field visit. Small insectivorous species seemed particularly impacted with the lowest catch rates for the White-faced Robin and Tropical Scrubwren recorded to date.

This report summarises the findings of the 2020 survey visit and presents the results within the context of the whole dataset from 1990 to 2020. The full results of this work will be published elsewhere as individual scientific papers and references to this work to date are highlighted with future publications planned.

2.0 Introduction

In 1989, the Australian Bird Study Association (ABSA), in conjunction with the Australian Bird & Bat Banding Schemes (ABBBS) proposed a special long-term bird-banding project to be conducted at Kutini-Payamu National Park. The aims were to collect, collate and disseminate data on birds rarely studied in Australia.

Very little is known about the migration, movements, sex, moult, longevity, breeding biology and vocalizations of the birds occurring in the northern tropics and even less is known about their ecology and population dynamics. Only one recently published paper, from this study, on survival rates of the White-faced Robin (Coleman et al 2012) with a prior paper detailing sexual dimorphism in the same species (Hardy and Van Gessell 1992) and another on morphometrics of two honeyeater species (Hardy and Van Gessell 1994) have been written to date. More recently, the impacts of climate change on birds has also gained focus, with rainforest species considered particularly vulnerable to this threat (e.g. Williams and Middleton 2008).

Previous studies of the birds in this area were summarised in the previous report (Coleman 2019b) and have included field observations of birds in the region (Johnson & Hooper, 1973; Roberts, 1975; Forshaw & Muller, 1978, Geeves & Horton, 1990), breeding biology (Beruldsen, 1990; Frith & Frith, 1993; Beruldsen & Uhlenhut, 1995), behaviour (Rawsthorne and Donaghey 2012) and phylogeny (Neilsen, 2018).

Prof. J. Kikkawa carried out some banding activities in Kutini-Payamu National Park in the early 1980s and Mr. S.G. Lane also banded birds in the same general area in 1988. The aim of this long-term study was to expand and build onto that initial data. The project commenced in November 1990 with the most recent visit made in 2020.

This paper summarises the results from the 2020 survey and also presents it within the context of the 30-year dataset. The full results of this work will be published elsewhere as individual scientific papers and references to this work to date are highlighted with future publications planned.

2.1 Study Aims

The study aims are described below. Whilst, this region has a unique and poorly understood avifauna, these aims are also applied to a much broader project that collects data using the same methods to achieve the similar objectives across the entire state of Queensland. The advantage of this sympatry is that the collected data can be used to look at both local, wider regional and state-wide trends in certain species.

This report will focus on the results pertaining to Kutini-Payamu National Park only. The study aims are:

- To establish a representative banded population sample of common indicator species within Kutini-Payamu National Park. This is to allow the estimation of baseline survival rates, based on MARK capture/recapture sampling and baseline productivity rates based on annual juvenile to adult ratios (e.g. Coleman et. al. 2012, Coleman & Noske 2017).

- To maintain a representative banded sample of common species, using strict protocols of standard mist netting time periods and standardised mist net locations at each site. This is to facilitate monitoring of short- and long-term changes in survival rates, productivity and the

calculation of abundance (Catch Rate) indices which can be reported on in a consistent manner, comparable between years and over long time periods (e.g. Coleman et. al. 2012).

- To take a range of biometric measurements including Body Mass from every bird captured so that size variation and sexual dimorphism within species can be determined and documented (e.g. Coleman & Lloyd 2017; Hardy & Van Gessell 1992; Hardy & Van Gessell 1994).

- To take a range of biometric measurements including Body Mass from every bird captured so that average body condition indices can be calculated for each species caught and compared over long time periods (e.g. Coleman et. al. 2019).

- To use a banded population of known age individuals to establish accurate and reliable criteria for ageing and sexing of species on plumage and moult characteristics in this area. This data will also be submitted for comparison, where possible, with data for the same species banded in other locations in Australia (e.g. Coleman et. al. 2009).

- To use a banded population of known age individuals to understand and document the moult strategies of species caught and how these may vary between birds of different ages and between species. Again, this data will also be submitted for comparison, where possible, with data for the same species banded in other locations in Australia (e.g. Coleman et. al. 2019).

- To use recaptures, to identify and understand local and seasonal movements in certain species. (e.g. Coleman 2019a)

3.0 Methods

3.1 Banding Locations and Dates

Although Kutini-Payamu National Park has a range of habitats this study has been restricted to the lowland tropical rainforest areas, within which the target species for this study are found. The park was divided into one-minute grids and until 2008, banders recorded the grid in which they trapped and banded birds to allow indicative movements when birds were recaptured to be identified. Since 2008, while the grid squares have still been recorded, every net set has also been accurately GPS recorded to provide more granularity of data. The grid map is shown in Figure 1 and the heavily shaded areas are those that have been most frequently sampled over the period of this study to date and actively targeted in each visit.

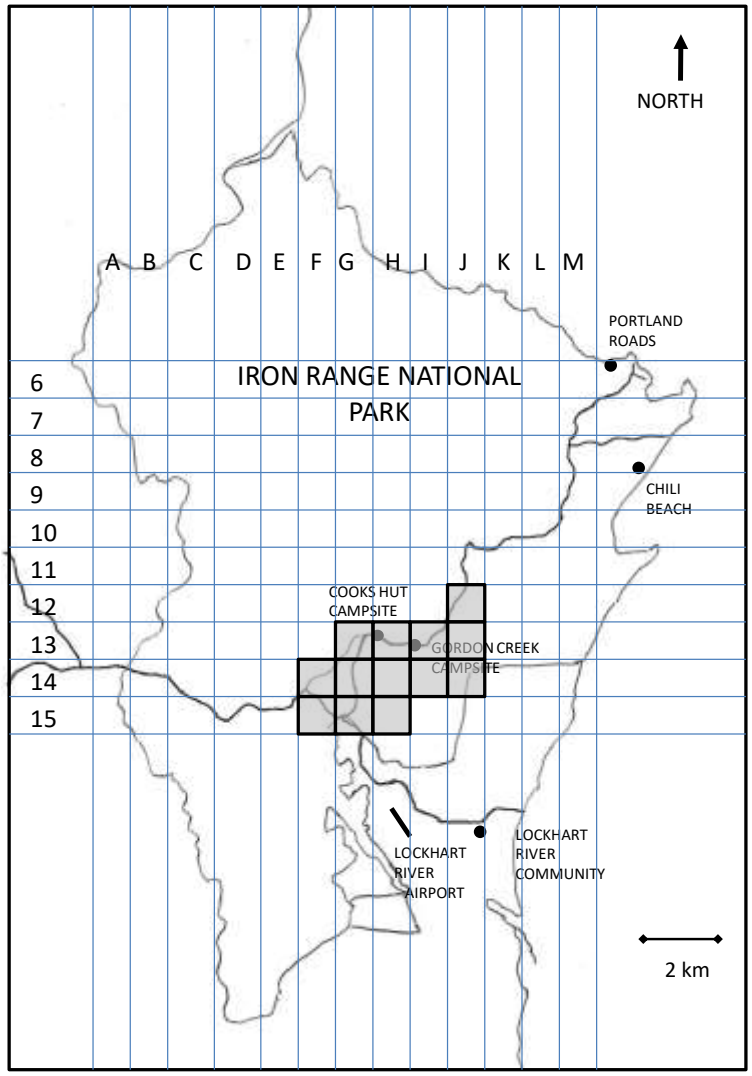

Figure 1: Grid squares used in the Kutini-Payamu National Park bird monitoring program

The first visit was made in November 1990 with regular visits through to the most recent in November 2020. While in the majority of cases visits were every 2 or 3 years there was a gap of 7 years between the 2011 and 2018 visits as a result of a number of unforeseen circumstances which prevented access to the site. Visits were made in 1990, 1994, 1997, 1999, 2000, 2002, 2005, 2008, 2011, 2018 and 2020 with the next visit proposed for 2023.

Figure 2 shows the locations on net sites used in 2020. While the usual locations along the Portland Road and the Smugglers Tree Track were sampled as normal, additional sites, nearer the airport were also introduced in 2018, visited again in 2020 and will also continue to be monitored in subsequent visits. These locations are away from the core monitoring sites and in some cases on unprotected land which may provide interesting comparisons between protected and unprotected rainforest sites in the area as more data is collected.

Figure 2: Survey locations used in the November 2020 bird banding surveys

3.2 Trapping, Banding, and Measuring

In line with the timing of the majority of other visits the 2020 visit was made from the 22nd to the 28th November and figure 2 shows the sites visited, which mirror those visited in 2018. Each site was sampled for one day, with activities moved to another grid square each day. Birds were captured using mistnets set in open areas located within the forest with birds captured as they forage, moving through the understorey. Nets were constantly monitored with birds brought back to, processed and released at a central location, close to all of the nets set in that particular monitoring period.

Every bird caught was banded with a uniquely coded metal band, supplied by the Australian Bird and Bat Banding Scheme (ABBBS). All birds were aged, sexed if possible and a series of morphometric measurements taken for further analysis. These were Flattened Wing Chord length (mm), Tail Length (mm) Tarsus Length (mm), Total Head Length (mm), Bill Length to Feather (mm), Bill Length to Skull (mm) and Body Mass to the nearest 0.1g. Body Mass was corrected for size by regressing weight against the composite size measurements to give an indicative body condition index for each bird caught (Coleman et al 2002).

The data collected on new birds and the recapture data for previously banded birds caught in subsequent visits has already been used to determine survival rates in some target species (Coleman 2019b). Productivity rates (proportion of juveniles caught annually), abundance indices (catch rates by sites and by species) and body condition indices (body mass corrected for size) were also recorded and trended over time. The consistent nature of the data collection allowed these trends, which indicate the health of bird populations, to be monitored and compared to the baseline data collected in the initial years.

This methodology also facilitated the detailed examination of plumage characters, morphometric variation and moult strategies in known age birds of a range of common species adding to information collected in previous visits.

Effort was an important metric captured on each visit and was calculated by multiplying the metres of net set by the hours of operation. Dividing the number of birds caught by the effort metric then provided a simple measure of catch rate which was used as an indirect measure of abundance. Unfortunately, this important metric was only recorded from 2011 onwards when the methodology was re-evaluated and additional monitoring protocols introduced.

The percentage of juveniles caught each year provided an indirect measure of productivity. This was compared between years to demonstrate positive or negative trends in the juvenile proportions seen in the birds caught.

Statistics analysis was undertaken using StatsDirect v.10 and comprised a range of parametric and non-parametric methods. Simple linear regression was used to test trends in catch rates and juvenile proportions with $\chi 2$ tests used to test between year variation in the trends.

4.0 Results

Since 1990 a total of 6,001 birds of 63 species have been captured with a further 618 recaptures of previously banded birds. This is a total of 6,619 bird encounters over the 28 years of the study to date. Since 1988, a total of 12 visits have been made to the site. Of these 9 have been scheduled as part of this study with the remainder adhoc visits by other researchers who have provided their data to allow it to be incorporated into the overall dataset for the site. The most recent visit was from the 22nd November to 28th November 2020 (Table 1).

This visit was the first made after a major cyclone event in the 2018/2019 wet season which resulted in Cyclone Trevor directly impacting all of the study sites used in this project. The impacts to the vegetation are still apparent today with significant structural damage and leaf loss still evident.

The upper canopy contained a mere 20-30% of sky coverage in most locations. The mid and lower canopies were more or less intact with approximately 60% sky coverage. By contrast, some of the protected locations behind hills and along creeks and rivers appeared to have suffered very little impact from the weather event. Regrowth was present in all specimen trees across all sites and high numbers of rainforest seedlings were present in the understory. In one $4m^2$ survey plot there were >100 native seedling species and no weed species seen. Upper/Emergent canopy Species with little to no damage or had shed all lateral branch as defence to the strong winds included *Acacia auriculiformis, Sterculia shillinglawii, Castanospermum australe, Argyrodendron polyandrum, Palaquium galactoxylon* and a range of *Lauraceae* species (Aaron Bean *pers. obs*.).

Year	Start Date	End Date	Scheduled (S) or Adhoc/other research (A)
1988	22/11/1988	27/11/1988	A
1990	12/09/1990	23/11/1990	S
1994	19/11/1994	25/11/1994	S
1997	16/08/1997	23/08/1997	S
1999	14/11/1999	19/11/1999	S
2000	02/08/2000	04/08/2000	A
2002	16/11/2002	24/11/2002	S
2005	03/10/2005	16/12/2005	S
2006	26/10/2006	30/11/2006	A

Year	Start Date	End Date	Scheduled (S) or Adhoc/other research (A)
2008	08/11/2008	15/11/2008	S
2011	16/11/2011	24/11/2011	S
2018	18/11/2018	24/11/2018	S
2020	22/11/2020	28/11/2020	S

Table 1: Visit dates and durations for bird banding at Kutini-Payamu National Park

4.1 Species banded

Of the 63 species banded as part of this study 28 have been captured ten or less times over period of the study with minimal recaptures (Table 2). Twenty species have been captured 50 times or more and all of those species have also recorded multiple recaptures over the 30 years of the study so far. In 2020, the most commonly caught species were Little Shrike-thrush (179 encounters) and Yellow-spotted Honeyeater (97 encounters). The most commonly caught and recaptured species overall have been the Little Shrike-thrush and White-faced Robin with 1,064 and 1,063 bird encounters respectively. White-faced Robin, normally the second most common species encountered on visits was the only the fourth most commonly caught species on this visit with only 76 encounters. The numbers of birds caught in 2020 and the overall totals are shown in table 2.

Species	New 2020	Retrap 2020	Total New	Total Retraps	Total Encounters
Orange-footed Scrubfowl			**8**	**0**	**8**
Australian Brush-turkey			**10**	**1**	**11**
Royal Spoonbill			**0**	**0**	**0**
Superb Fruit-Dove	1		**3**	**0**	**3**
Bar-shouldered Dove			**1**	**0**	**1**
Emerald Dove	3	1	**49**	**7**	**56**
Intermediate Egret			**1**	**0**	**1**
Marbled Frogmouth			**1**	**0**	**1**
Azure Kingfisher	17	2	**70**	**6**	**76**
Little Kingfisher	4		**27**	**0**	**27**
Yellow-billed Kingfisher	3		**29**	**1**	**30**
Blue-winged Kookaburra			**1**	**0**	**1**
Buff-breasted Paradise Kingfisher	34	1	**255**	**12**	**267**
White-throated Nightjar			**1**	**0**	**1**
Large-tailed Nightjar			**3**	**0**	**3**
Rainbow Lorikeet	17		**17**	**0**	**17**
Brush Cuckoo			**1**	**0**	**1**
Chestnut-breasted Cuckoo	3		**13**	**0**	**13**
Little Bronze-Cuckoo	3		**11**	**0**	**11**
Noisy Pitta	5		**64**	**2**	**66**
Red-bellied Pitta			**1**	**0**	**1**
Rufous Fantail			**36**	**0**	**36**
Northern Fantail			**9**	**0**	**9**
Leaden Flycatcher			**2**	**0**	**2**
Satin Flycatcher			**1**	**0**	**1**
Yellow-breasted Boatbill	13		**67**	**2**	**69**

Species	New 2020	Retrap 2020	Total New	Total Retraps	Total Encounters
Frilled Monarch	7		**75**	**5**	**80**
Shining Flycatcher	15	5	**78**	**11**	**89**
Black-winged Monarch	2		**14**	**1**	**15**
Spectacled Monarch	40	2	**223**	**23**	**246**
White-eared Monarch			**1**	**0**	**1**
White-browed Robin			**11**	**3**	**14**
Yellow-legged Flycatcher	1		**10**	**0**	**10**
White-faced Robin	62	14	**994**	**145**	**1139**
Grey Whistler	12		**67**	**5**	**72**
Little Shrike-thrush	162	17	**1006**	**237**	**1243**
Varied Triller	2		**9**	**0**	**9**
Australian Figbird			**1**	**0**	**1**
Northern Scrub-robin		1	**28**	**2**	**30**
Fairy Gerygone	15		**104**	**3**	**107**
Large-billed Gerygone	2		**5**	**0**	**5**
Tropical Scrubwren	31	2	**395**	**33**	**428**
Tawny Grassbird			**1**	**0**	**1**
Lovely Fairy-wren	3	1	**102**	**5**	**107**
White-breasted Woodswallow			**3**	**0**	**3**
Mistletoebird			**10**	**0**	**10**
Yellow-bellied Sunbird	1		**15**	**0**	**15**
Silvereye	9		**33**	**0**	**33**
Dusky Honeyeater	81		**670**	**8**	**678**
Brown-backed Honeyeater	1		**32**	**0**	**32**
Green-backed Honeyeater	3		**21**	**0**	**21**
Yellow-spotted Honeyeater	91	6	**650**	**76**	**726**
Graceful Honeyeater	38		**298**	**4**	**302**
White-streaked Honeyeater	4		**34**	**0**	**34**
Tawny-breasted Honeyeater	21		**177**	**8**	**185**
Red-browed Finch	5		**7**	**0**	**7**
Yellow Oriole	1		**16**	**1**	**17**
Spangled Drongo	2		**12**	**0**	**12**
Metallic Starling	4		**77**	**0**	**77**
Black-eared Catbird			**11**	**1**	**12**
Magnificent Riflebird	6	2	**101**	**12**	**113**
Trumpet Manucode			**4**	**0**	**4**
Black Butcherbird	1		**25**	**4**	**29**
TOTALS	**725**	**54**	**6001**	**618**	**6619**

Table 2: Numbers of birds banded and recaptured at Kutini-Payamu National Park in total and during the 2020 visit

4.2 Catch rates

Catch rates, as described in the methods, using an estimate of effort and then calculating a catch rate based on number of birds caught, divided by effort, has now been used in the last two visits following a methodology change in 2008. For the first two visits, although catch rates were higher in 2018, compared to 2011, there was no significant difference between the two years. However, figure 3 shows the catch rate in 2020 was significantly higher than in the previous two visits (r=0.95, df=2, P=0.05).

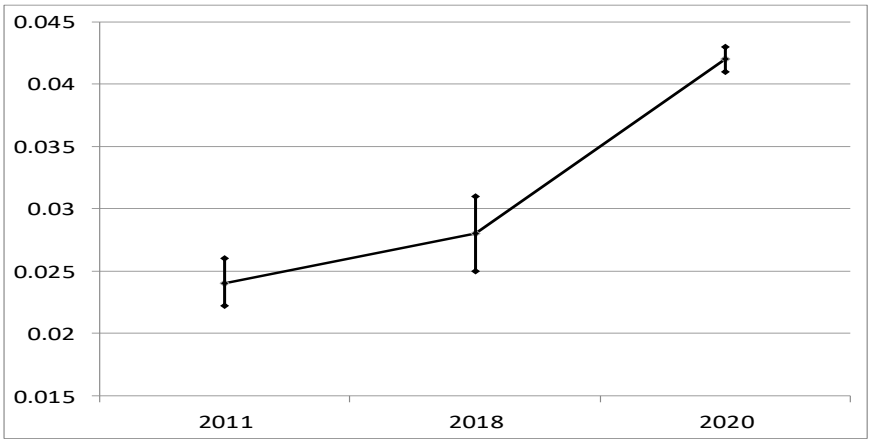

Figure 3: The catch rate expressed as metres of net, multiplied by the hours in field regressed on the number of birds caught.

When looking at birds as a proportion of the total catch, the data can be compared for each visit and are shown below for the five most commonly caught insectivorous species (Figure 4) and the four most common nectar feeding species (Figure 5). For insectivores, White-faced Robin and Little Shrike-thrush have been the most commonly and consistently caught species over the study. While Little Shrike-thrush continued this trend in 2020, the proportion of White-faced Robins in the overall catch was the lowest recorded to date at only 9.9%, compared to an overall average across all years of 17.6%. Tropical Scrubwren catch rate in 2020 was also the lowest recorded to date at 4.3%, compared to a mean catch rate across all years of 7%.

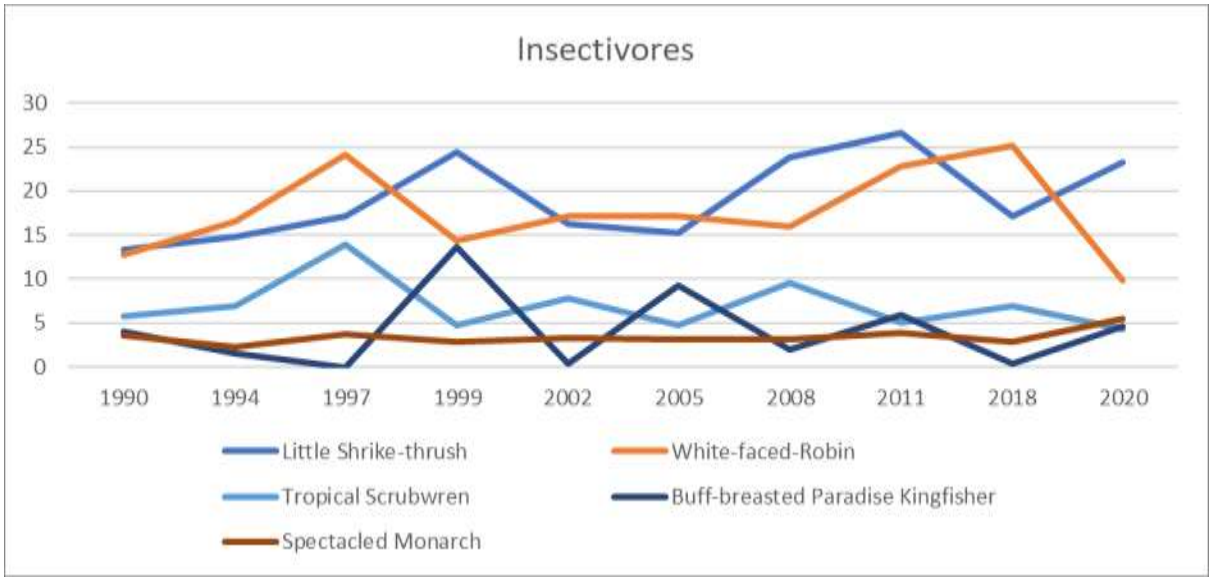

Figure 4: Proportion of the overall catch recorded for the commonest Insectivore species caught at Kutini-Payamu National Park (Y axis represents percentage of overall catch)

The Yellow-spotted Honeyeater remained the most commonly encountered nectarivore in 2020 at 12.7% of the overall catch compared to a mean catch rate across all years of 11%. Dusky Honeyeaters were the second most commonly encountered nectarivore at 10.6%, compared to an overall mean of 8.6%.

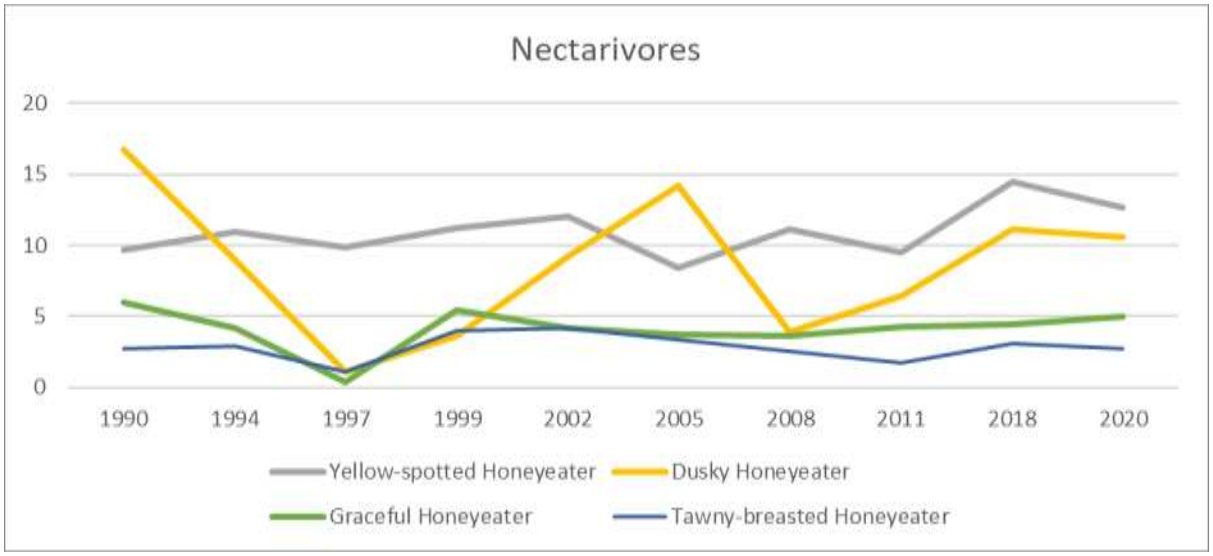

Figure 5: Proportion of the overall catch recorded for the commonest Nectarivore species caught at Kutini-Payamu National Park (Y axis represents percentage of overall catch)

4.3 Proportion of juveniles

The proportion of juveniles caught for the most encountered insectivores and nectarivores are shown in figures 6 and 7 respectively. Juvenile proportions were higher in 2020 than previously recorded for two species of insectivore, the Little Shrike-thrush (30.9%) and Spectacled Monarch (35.9%). In contrast, both the Tropical Scrubwren and White-faced Robin showed lower juvenile proportions than were recorded in 2018 although these differences were not significant ($\chi 2$).

No such extremes were recorded within the nectarivore species highlighted (Figure 7) although the proportion of juveniles recorded in 2020 for the Tawny-breasted Honeyeater was the second highest recorded in the study. Overall, combining all the species shown, the percentage of juveniles caught in 2020 was 16.6%, the second highest recorded with 19.1% of the catch in 2005 comprising juveniles.

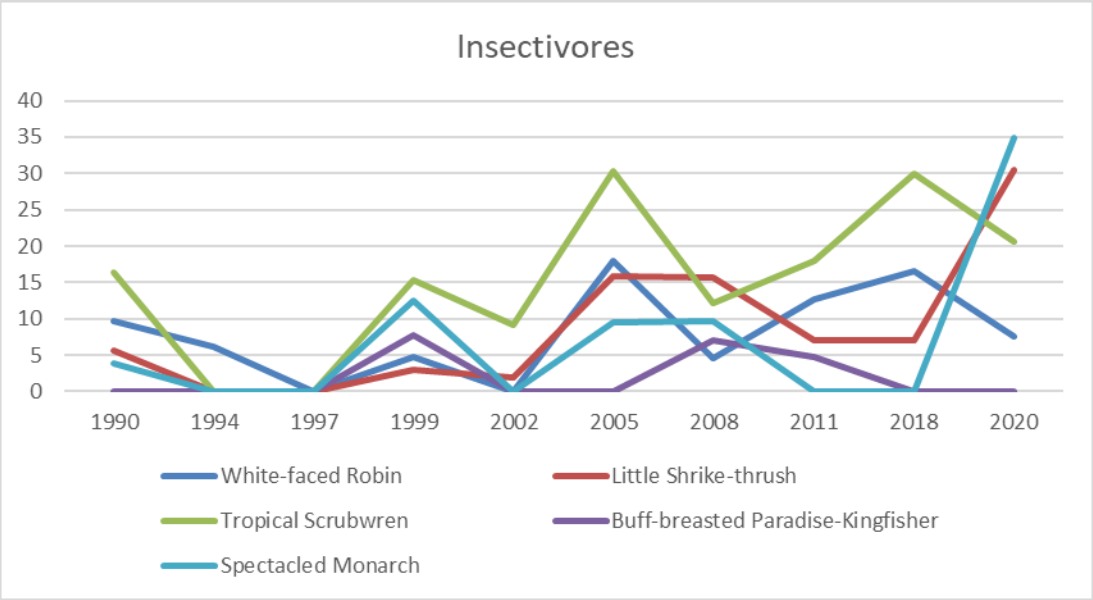

Figure 6: Proportion of juvenile plumaged birds recorded for the commonest Insectivore species caught at Kutini-Payamu National Park (Y axis represents percentage of juveniles in the overall catch)

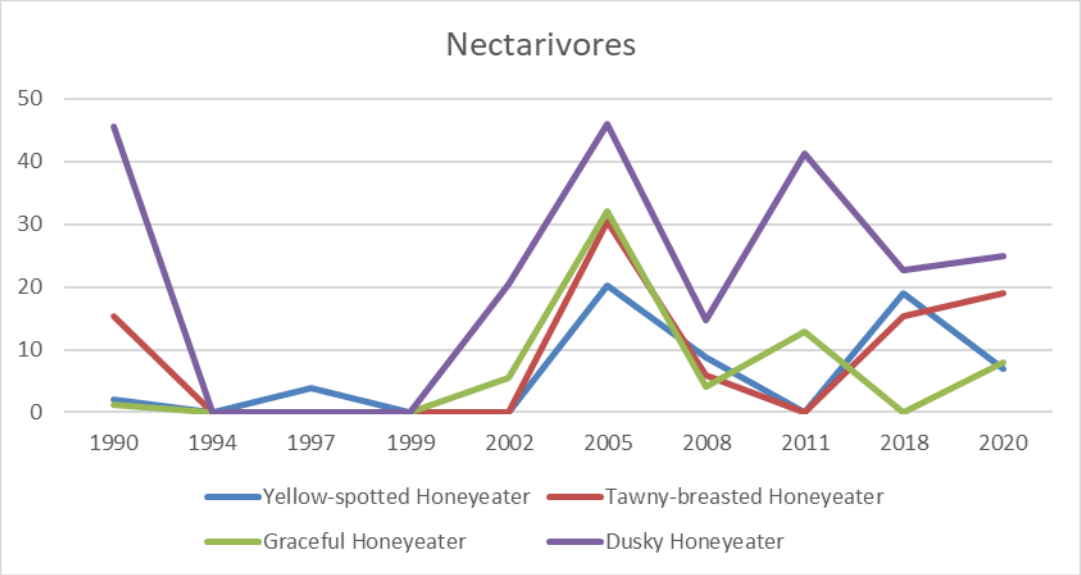

Figure 7: Proportion of juvenile plumaged birds recorded for the commonest Nectarivore species caught at Kutini-Payamu National Park (Y axis represents percentage of juveniles in the overall catch)

4.4 Evidence of Wing Moult and Breeding

In 2020 four of the nine presented species demonstrated the highest proportion of birds in moult recorded to date (Table 3). These were the White-faced Robin, Tropical Scrubwren, Yellow-spotted Honeyeater and Graceful Honeyeater. By contrast, no moult was recorded in the Buff-breasted Paradise-kingfisher or Spectacled Monarch and has not been recorded to date over the duration of this study.

Evidence of breeding, through the presence of cloacal protuberances or vascularised brood patches was only examined from 2008 onwards. For the commonly caught species analysed in this report there was evidence of breeding in all species in November, with the exception of the Spectacled Monarch (Table 3).

Month	**Nov**	**Nov**	**Aug**	**Nov**	**Nov**	**Nov**	**Nov**	**Nov**	**Nov**	**Nov**
Species\Year	**1990**	**1994**	**1997**	**1999**	**2002**	**2005**	**2008**	**2011**	**2018**	**2020**
Little Shrike-thrush	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1
White-faced Robin	5.3	2.2	1.6	7.7	2.7	4.2	0.0	9.7	1.9	15.2
Yellow-spotted Honeyeater	6.3	2.4	0.0	9.6	11.8	10.2	1.8	13.9	8.3	18.2
Dusky Honeyeater	2.9	8.6	0.0	10.0	5.1	20.0	7.4	8.7	20.9	15.5
Tropical Scrubwren	54.5	33.3	0.0	33.3	27.3	48.5	27.3	56.4	25.9	58.8
Graceful Honeyeater	0.0	0.0	0.0	6.7	5.6	20.0	0.0	11.4	12.1	13.2
Buff-breasted Paradise-kingfisher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spectacled Monarch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Month	Nov	Nov	Aug	Nov	Nov	Nov	Nov	Nov	Nov	Nov
Species\Year	**1990**	**1994**	**1997**	**1999**	**2002**	**2005**	**2008**	**2011**	**2018**	**2020**
Tawny-breasted Honeyeater	23.1	27.3	0.0	54.5	38.9	43.5	5.9	23.1	30.8	33.3

Table 3: Percentage of the birds captured on each visit that were in active wing moult (percentage figures and showing evidence of active breeding through presence of engorged cloacal protuberances or brood patches (shaded squares)

4.5 Recaptures and Longevity

Table 4 shows all recaptures of birds banded in previous visits that were recaptured in 2020. This was a total of 52 recaptures of 10 species. Overall 618 recaptures of 27 species have been recorded since the commencement of the study in 1990. In 2020, White-faced Robin (13 recaptures) and Little Shrike-thrush (17 recaptures) were the most commonly recaptured species accounting for 56.6% of all recaptures. White-faced Robins were captured up to 9 years after their original banding and one Little Shrike-thrush was recaptured 15 years after it was originally banded. One recaptured Buff-breasted Paradise-kingfisher, banded in February 2005 as a nestling and recaptured on this visit was a new longevity record at 15 years and 10 months elapsed between banding and recapture for this migratory species.

Overall the recapture rate was only 7%, compared to recapture rates in previous years varying from 9% to 26%. Over the period of the study the mean recapture rate over time was 14% highlighting how low the recapture rate was on this visit, compared to previous times.

Band	Species	Age	Sex	Date	Location	Grid	Elapsed Age (years)
043-14089	Little Shrike-thrush	2+		20/11/2018	Kutini-Payamu NP	G13	
				22/11/2020	Kutini-Payamu NP	G13	2 yrs
072-14115	Emerald Dove	1+	M	22/11/2018	Kutini-Payamu NP	H13	
				22/11/2020	Kutini-Payamu NP	H13	2 yrs
024-54187	White-faced Robin	1+		20/11/2011	Kutini-Payamu NP	I14	
				22/11/2020	Kutini-Payamu NP	J13	9 yrs
025-94005	White-faced Robin	2+		19/11/2018	Kutini-Payamu NP	J14	
				22/11/2020	Kutini-Payamu NP	J13	2 yrs
026-85066	White-faced Robin	2+		18/11/2011	Kutini-Payamu NP	F15	
				23/11/2020	Kutini-Payamu NP	G13	9 yrs
043-14082	Yellow-spotted Honeyeater	2+		20/11/2018	Kutini-Payamu NP	G13	
				23/11/2020	Kutini-Payamu NP	G13	2 yrs
026-85056	White-faced Robin	2+		18/11/2011	Kutini-Payamu NP	H14	
				23/11/2020	Kutini-Payamu NP	G13	9 yrs
042-59737	Little Shrike-thrush	2+		18/11/2011	Kutini-Payamu NP	H14	

Band	Species	Age	Sex	Date	Location	Grid	Elapsed Age (years)
				23/11/2020	Kutini-Payamu NP	G13	9 yrs
043-14084	Yellow-spotted Honeyeater	2-		20/11/2018	Kutini-Payamu NP	G13	
				23/11/2020	Kutini-Payamu NP	G13	2 yrs
042-51496	Little Shrike-thrush	1+		09/11/2008	Kutini-Payamu NP	G14	
				23/11/2020	Kutini-Payamu NP	G13	12 yrs
042-49601	Little Shrike-thrush	1+		20/11/2005	Kutini-Payamu NP	H13	
				23/11/2020	Kutini-Payamu NP	G13	15 yrs
026-85060	White-faced Robin	2+		18/11/2011	Kutini-Payamu NP	H14	
				23/11/2020	Kutini-Payamu NP	H13	9 yrs
042-59776	Little Shrike-thrush	2+		22/11/2011	Kutini-Payamu NP	H14	
				23/11/2020	Kutini-Payamu NP	H13	9 yrs
026-68612	White-faced Robin	1		20/11/2011	Kutini-Payamu NP	H14	
				23/11/2020	Kutini-Payamu NP	H13	9 yrs
042-59777	Northern Scrub-robin	1+		22/11/2011	Kutini-Payamu NP	H14	
				23/11/2020	Kutini-Payamu NP	H13	9 yrs
027-28473	White-faced Robin	2+		19/11/2018	Kutini-Payamu NP	H13	
				23/11/2020	Kutini-Payamu NP	H13	2 yrs
042-38610	Little Shrike-thrush	1+		20/11/2011	Kutini-Payamu NP	F15	
				23/11/2020	Kutini-Payamu NP	H13	9 yrs
027-32605	White-faced Robin	1+		19/11/2018	Kutini-Payamu NP	J14	
				23/11/2020	Kutini-Payamu NP	J13	2 yrs
043-02106	Little Shrike-thrush	1+		20/11/2011	Kutini-Payamu NP	G14	
				23/11/2020	Kutini-Payamu NP	J13	9 yrs
042-04210	Little Shrike-thrush	1+		11/11/2008	Kutini-Payamu NP	J14	
				23/11/2020	Kutini-Payamu NP	J13	12 yrs
036-63874	Yellow-spotted Honeyeater	1+		20/11/2018	Kutini-Payamu NP	J14	
				23/11/2020	Kutini-Payamu NP	J13	2 yrs
043-02104	Yellow-spotted Honeyeater	1+		20/11/2011	Kutini-Payamu NP	G14	
				23/11/2020	Kutini-Payamu NP	J13	9 yrs
025-94016	Tropical Scrubwren	1+	F	20/11/2018	Kutini-Payamu NP	J13	
				23/11/2020	Kutini-Payamu NP	J13	2 yrs

Band	Species	Age	Sex	Date	Location	Grid	Elapsed Age (years)
042-01304	Little Shrike-thrush	1+		19/11/2018	Kutini-Payamu NP	J14	
				23/11/2020	Kutini-Payamu NP	J13	2 yrs
043-11934	Little Shrike-thrush	2+		20/11/2018	Kutini-Payamu NP	J14	
				23/11/2020	Kutini-Payamu NP	J13	2 yrs
073-14801	Magnificent Riflebird	1+		20/11/2011	Kutini-Payamu NP	I14	
				23/11/2020	Kutini-Payamu NP	J13	9 yrs
043-14096	Yellow-spotted Honeyeater	2-		22/11/2018	Kutini-Payamu NP	F15	
				24/11/2020	Kutini-Payamu NP	F15	2 yrs
043-11941	Little Shrike-thrush	2+		21/11/2018	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	2 yrs
025-94017	White-faced Robin	2+	M	20/11/2018	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	2 yrs
025-94022	White-faced Robin	2+		21/11/2018	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	2 yrs
027-32601	Shining Flycatcher	1+	M	19/11/2018	Kutini-Payamu NP	J14	
				24/11/2020	Kutini-Payamu NP	H13	2 yrs
042-59798	Yellow-spotted Honeyeater	2-		24/11/2011	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	9 yrs
042-59733	Little Shrike-thrush	2+		17/11/2011	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	9 yrs
025-94023	Shining Flycatcher	1+	M	21/11/2018	Kutini-Payamu NP	H13	
				24/11/2020	Kutini-Payamu NP	H13	2 yrs
042-38624	Little Shrike-thrush	1+		22/11/2011	Kutini-Payamu NP	G15	
				25/11/2020	Kutini-Payamu NP	G15	9 yrs
042-38627	Little Shrike-thrush	1+		23/11/2011	Kutini-Payamu NP	G15	
				25/11/2020	Kutini-Payamu NP	G15	9 yrs
037-22739	Shining Flycatcher	2+	M	20/11/2011	Kutini-Payamu NP	I14	
				25/11/2020	Kutini-Payamu NP	J13	9 yrs
K0-13251	Azure Kingfisher	1+		20/11/2018	Kutini-Payamu NP	I14	
				25/11/2020	Kutini-Payamu NP	J13	2 yrs
037-59927	Shining Flycatcher	2+	F	23/11/2018	Kutini-Payamu NP	J13	
				25/11/2020	Kutini-Payamu NP	J13	2 yrs

Band	Species	Age	Sex	Date	Location	Grid	Elapsed Age (years)
035-95983	Shining Flycatcher	1	M	19/11/2018	Kutini-Payamu NP	J13	
				25/11/2020	Kutini-Payamu NP	J13	2 yrs
027-08861	Spectacled Monarch	2+		23/11/2018	Kutini-Payamu NP	J13	
				25/11/2020	Kutini-Payamu NP	J13	2 yrs
026-02927	White-faced Robin	1+		22/11/2011	Kutini-Payamu NP	G15	
				26/11/2020	Kutini-Payamu NP	G15	9 yrs
042-38624	Little Shrike-thrush	1+		22/11/2011	Kutini-Payamu NP	G15	
				26/11/2020	Kutini-Payamu NP	G15	9 yrs
025-97315	Spectacled Monarch	2+		09/11/2018	Kutini-Payamu NP	H14	
				26/11/2020	Kutini-Payamu NP	H13	2 yrs
041-84307	Little Shrike-thrush	1		09/11/2018	Kutini-Payamu NP	H14	
				26/11/2020	Kutini-Payamu NP	H13	2 yrs
K0-03385	**Buff-breasted Paradise-kingfisher**	P		**18/02/2005**	**Kutini-Payamu NP**	**u/k**	
	(LONGEVITY RECORD)			**27/11/2020**	**Kutini-Payamu NP**	**I16**	**16 yrs**
027-29378	White-faced Robin	2+		18/11/2018	Kutini-Payamu NP	H16	
				27/11/2020	Kutini-Payamu NP	H16	2 yrs
027-29383	Tropical Scrubwren	2-	F	18/11/2018	Kutini-Payamu NP	H16	
				27/11/2020	Kutini-Payamu NP	H16	2 yrs
027-29379	White-faced Robin	2+		18/11/2018	Kutini-Payamu NP	H16	
				27/11/2020	Kutini-Payamu NP	H16	2 yrs
027-29378	White-faced Robin	2+		18/11/2018	Kutini-Payamu NP	H16	
				27/11/2020	Kutini-Payamu NP	H16	2 yrs
01A-69646	Lovely Fairywren	1+	M	21/11/2018	Kutini-Payamu NP	I14	
				27/11/2020	Kutini-Payamu NP	H13	2 yrs
073-33747	Magnificent Riflebird	2+	F	23/11/2018	Kutini-Payamu NP	H13	
				27/11/2020	Kutini-Payamu NP	H13	2 yrs

Table 4: Original Banding date and recapture dates and grid squares for all birds recaptured during the 2020 visit to Kutini-Payamu National Park

5.0 Discussion

The Kutini-Payamu National Park represents a unique habitat, encompassing an area of lowland tropical rain forest on the Cape York peninsula. Lowland tropical rainforest considered one of the most at risk habitats from climate change (Deb et al 2018) indicating that monitoring for impacts is particularly relevant in this restricted habitat type. Very few long-term studies on lowland tropical rainforest species have been conducted and this represents the only such study in Australia. As a long-term monitoring study this one has significant value due to the uniqueness of the habitat and avifauna occurring in this region. The consistently applied methodology has allowed data to be compared between years and across the duration of the study with recent improvements in the methodology enhancing future monitoring, without jeopardising the value of the data collected in prior years. The 2020 visit provided the first opportunity to investigate the impacts of a major cyclone on the bird population following a major cyclone impacting the study sites in the 2018/2019 wet season with the next visit in 2023 providing an opportunity to further monitor and understand the avifauna recovery.

Catch rates within and between years and species proportions in the catch

Until 2011, catch rates per species were measured as a proportion of the overall catch, providing a relative measure of abundance for a species when compared to the overall catch. While interesting to compare proportions within a catch, this does not provide an indication of overall bird abundance, indirectly measured through a catch rate estimate. Since 2011, this has been addressed and a simple catch rate index which can be compared between years calculated. Although only three sampling periods have been measured in this way, there was no significant difference in the catch rate between the first two sampling periods (November 2011 and November 2018) but the catch rate in 2020 was significantly higher than in the previous two years.

Interestingly, although the catch rate was the highest recorded, there were differences in the proportion of species in the catch with the White-faced Robin being noticeably reduced in numbers both caught and seen during banding exercises. The Tropical Scrubwren, another smaller insectivore also recorded the lowest proportion caught in the study to date. The proportion of Little Shrike Thrush caught; a much larger insectivore remained similar to previous years. It is possible that these highly sedentary insectivorous species were impacted by the cyclone with the larger species being more resilient to the impacts and able to recover more quickly. Nectarivores seemed less impacted and this may be a reflection on their more mobile nature, moving between food sources and potentially better suited to avoiding poor conditions either during or post the cyclone event.

Recaptures and numbers of juveniles

Despite the high catch rate, recapture rates were the lowest ever recorded and half the mean recapture rate over the duration of the study. Combined with the reduced numbers of smaller insectivores this may indicate that the cyclone had a significant impact on the resident sedentary bird populations. The data may indicate that resident birds in the exposed study sites either experienced displacement or significant mortality, with birds from more sheltered areas expanding into the vacant areas. The vegetation surveys indicated that the majority of study sites had only 20-

30% of sky cover, compared to sheltered leeward and riparian locations having almost normal sky cover percentages which may support this theory.

The high juvenile proportions for some species are also difficult to explain with two insectivore species recording the highest juvenile proportions recorded to date (Little Shrike-thrush and Spectacled Monarch). However, conditions for insectivores may actually be improved as a result of increased rotting material on the ground and this combined with the ability for birds to potentially have expanded into vacant areas could have improved productivity in at least some species. Certainly, with a number of species recorded in active wing moult, an activity typically conducted post breeding, there is evidence that many birds may have already bred with others still breeding as evidenced by the presence of brood patches and cloacal protuberances.

Of the recaptures 56% were from the previous visit 2 years earlier with a further 39% from the 2011 visit with only three birds (5%) older than 10 years when recaptured (two 12-year-old and one 15 year old). This contrasts with the 2018 visit where 30 of the 77 recaptures (39%) of the recaptured birds were ten years or older. This may again be an indication of the longer-term impacts of the cyclone with older birds being replaced by new and/or younger birds post cyclone.

Further visits will help determine whether the unusual results of this visit are temporary or permanent and how quickly the avifauna recovers, with the next visit planned for 2023. On this visit it will be interesting to see whether any older banded individuals have returned or whether the events of 2018 represent a re-baselining of the resident bird populations in the study sites. If the latter, this has important considerations for these bird populations given many climate models predict increasing adverse weather events and an understanding of the time taken to respond and recover by these resident populations will be important to understand.

6.0 Future Surveys

Surveys will continue to be conducted every two to three years to continue adding data to this very important long-term dataset. The next survey is scheduled for the third week in November 2023.

7.0 Acknowledgments

The author and organisers of this project would like to recognise the support of the Kuuku Ya'u people (including the Kungkay people and Kanthanampu people) in supporting and allowing this project to continue over its many years of operation. Queensland Parks and Wildlife have also supported the project through the provision of permits to conduct research and local on-site support and information from the ranger staff for which we are also very grateful.

Many banders and helpers have supported the project over its 30 years so far, dedicating significant time and money personally to these trips to ensure quality data is collected on every visit. Without these volunteer attendees this study would be impossible, and we thank every single individual for their contribution and hope they may continue supporting this project as it continues.

Finally, the Australian Bird and Bat banding Scheme support the project through the provision of the bands used in this study.

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