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Front Cover: Cape York Star Finches drinking at a waterhole, Lakefield N.P.
Female on the right, male on the left, juvenile at the back
Photo by Doug Herrington

The status of the Cape York Star Finch *Bathilda ruficauda clarescens* in the south-eastern Gulf of Carpentaria

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Abstract

The Cape York Star Finch *Bathilda ruficauda clarescens* consists of three populations along the western coast of Cape York Peninsula and one on the eastern coast, which is thought to be the largest. While the ecology and size of the latter population have been investigated to some extent, little is known of the western populations, including the smallest one centred on Karumba in southeast Gulf of Carpentaria. We analysed historical records and undertook regular surveys of the Karumba population from 2016 to 2022. Originally described in 1874, the first published record of the subspecies in the 20th century was in 1964. Since 1991, finches have been sighted 66 times, almost all within 14 km of Karumba Post Office. Although they were recorded in 20 of the 23 years from 2000 to 2022, over one-third of records were during the last three years. Over one-half of records fell from May to July, and few sightings were made during the wet season (November to April). There was some evidence of movements within the Karumba area as various sites dried out over the dry season. Juveniles were reported in nine years, and predominated in flocks of 100 or more birds. An observation of four juveniles being fed by an adult bird constitutes the first probable breeding record. Based on recent records, the Karumba region appears to support a small resident population of 24-70 adult Star Finches.

Introduction

The Star Finch *Bathilda ruficauda* is one of eight species of grass-finches (Estrildidae) that are endemic to northern Australia. The three recognised subspecies comprise the (1) Western Star Finch *B. r. subclarescens*, occurring from the Pilbara, Western Australia, through the Top End of the Northern Territory; (2) Cape York Star Finch *B. r. clarescens*, confined to Cape York and southeast Gulf of Carpentaria, and (3) Southern Star Finch *B. r. ruficauda*. The last is considered threatened, being listed as Endangered in southern Queensland and Extinct in northern New South Wales (Holmes 1996; Department of the Environment 2022b). While the Cape York Star Finch was formerly considered rare (e.g. Todd *et al.* 2003) and listed as Near Threatened in 1990, 2000 and 2010 (Garnett *et al.* 2011), it has since been down-listed to Least Concern (Todd *et al.* 2021; Department of the Environment 2022a). This subspecies differs from the Western Star Finch in having more greyish upperparts, and slightly larger white spots on the underparts with a richer yellow on the belly and vent (Plate 1 and inset to Fig. 1) (Higgins *et al.* 2006).

Although the Cape York Star Finch (CYSF) was described by Ernst Hartert (1899) from specimens obtained by Albert Meek at Chester River, 45 km north-east of Coen, in June 1898, Hartert evidently overlooked two specimens that had been collected 24 years earlier by Kendall Broadbent in 1874 (Atlas of Living Australia 2022). The specimens had been purchased by William Macleay in September 1875, on the return voyage of the French ship *Chevert* after its scientific

Plate 1. Adult female (left) and adult male (right) Cape York Star Finch (Doug Herrington)

expedition through the Torres Strait Islands to New Guinea (Fulton 2021). The two male specimens were almost certainly collected at Karumba as this species is unlikely to have been encountered at the other locations where the ship docked along the Queensland coast (Fulton 2021). The other 16 bird specimens collected by Broadbent and purchased by the *Chevert's* naturalists are all referable to Karumba in 1874 (Fulton 2021; Atlas of Living Australia 2022).

The CYSF is now known to occur in the northern grasslands of Lakefield National Park (NP) at the head of Princess Charlotte Bay on the eastern side of Cape York Peninsula, and in three localities on the western coast: southwest of Aurukun, the Pormpuraaw-Kowanyama region, and around Karumba, south-eastern Gulf of Carpentaria (Dorricott & Garnett 2007; Forshaw & Shephard 2012). The western Peninsula population has recently been estimated to comprise 3,000 birds (Department of the Environment 2022a). Historical records show that "large" numbers were present at Aurukun, Pormpuraaw and Kowanyama, but there have been relatively few reports from the Karumba region (Dorricott & Garnett 2007). The lack of published information on the abundance and breeding status of the Karumba population provided the impetus for this study. We undertook year-round surveys and sought evidence of breeding during regular visits to the region.

Methods and study area

We extracted records of CYSFs in the southeast Gulf from the two national Atlases of Australian Birds (Blakers *et al.* 1984; Barrett *et al.* 2003), online databases (Birdata 2022; Atlas of Living Australia 2022; eBird 2022) and the published literature (Holmes 1998). Duplicated records were omitted. We also sought records from trip reports by birders and birding guides by searching the "Birding Australia Mailing List Archive" (Birding-Aus 2022). For eBird sightings, we used their definition of "Carpentaria County" as

equivalent to southeast Gulf of Carpentaria, which corresponds to the Local Government Area of the Carpentaria Shire Council. If a record had no geographical coordinates, we contacted the observers for this information, but if no response was received, where possible, we estimated the location of most records from habitat descriptions using Google Earth. All of our sightings are listed under the eBird hotspot "Karumba". Where "sensitive surveys" are listed in Birdata, we sought actual coordinates for these directly from BirdLife Australia using the Birdata Platform Extract.

RR and DH conducted 79 surveys in Normanton-Karumba region from 2016 to 2022 as follows (number of surveys in brackets): 2016 (6), 2017 (14), 2018 (15), 2019 (9), 2020 (13), 2021 (10) and 2022 (12). Descriptions of habitat in historical records were used to inform the surveys, which covered the area surrounding the town of Normanton, southwest as far as the Flinders River (c.58 km from Normanton) and northwest along the road to Karumba township (c.32 km from Normanton), including the ephemeral wetlands of the Karumba floodplains. We also had permission to conduct surveys on a cattle station that straddled the Flinders and Bynoe Rivers on either side of the Burke Developmental Road between 16 and 38 km southwest of Normanton. Occasional surveys were also undertaken around the Normanton and Bynoe Rivers.

The climate of the region is monsoon-tropical, with a pronounced wet season from November to April (Fig. 2). The mean annual rainfall for Normanton Airport from 2002 to 2023 was 802 mm ± 238 mm (SD), with 74% of the annual rainfall falling during the three months from January to March (data from BoM 2024). Rainfall records for Karumba Airport are incomplete, but the mean annual rainfall from 1939 to 1950 was 891 mm (BoM 2024), suggesting a slightly higher rainfall than Normanton. The timing of our surveys was strongly influenced by seasonal conditions and the availability of water. During the wet season, roads were occasionally closed due to flooding, preventing travel outside Normanton township. During the dry season, we surveyed numerous artificial waterholes, constructed for watering cattle, which hold water long after the wet season subsides. Three such waterholes had trees close to the water's edge where finches could rest when not drinking. They were easily observed with binoculars and/or a 60x spotting scope from the road. At the end of the dry season, when all waterholes were dry, we checked garden birdbaths in the town.

Results

CYSFs have been known to occur in the Karumba region since 1874 when Broadbent collected two specimens. Towards the end of the 19th Century, they were readily trapped in the area between Normanton and Cloncurry (North 1901-14). However, the first known record of CYSFs during the 20th Century was from Inkerman Station, north of Normanton, where four (2 adults and 2 immatures) were collected on 30 May 1964 during the second Harold Hall Australian Expedition (Hall 1974). Situated c.150 km NNE of Karumba, Inkerman Station lies between Karumba and the Pormpuraaw-Kowanyama region (240-296 km NNE of Karumba). CYSFs were not reported during the first *Atlas of Australian Birds* period (1977-1981; Blakers *et al.* 1984), but in 1991, Gordon Beruldsen reported them from Shady Lagoon, c.39 km SE of Karumba or 7 km SE of Normanton, as well as Karumba (Holmes 1998). During the second *Atlas* (1998-2002; Barrett *et al.* 2003) there were 23 records, of which 19 (82.6%) concerned the population in the Pormpuraaw-Kowanyama region. Of the remaining four records, three were located within 3 km of Karumba (Appendix 1), and one record, 55 km SSW of Aurukun.

From 1991 to 2022, there were 66 sightings of CYSFs (Appendix 1), all of which fell within 14 km of Karumba Post Office (Fig. 1) except for the record from Shady Lagoon (see above). The remaining 65 records fell in one of four areas: Karumba township; the floodplain east of the town; Karumba Point, north of the town; and the turnoff from

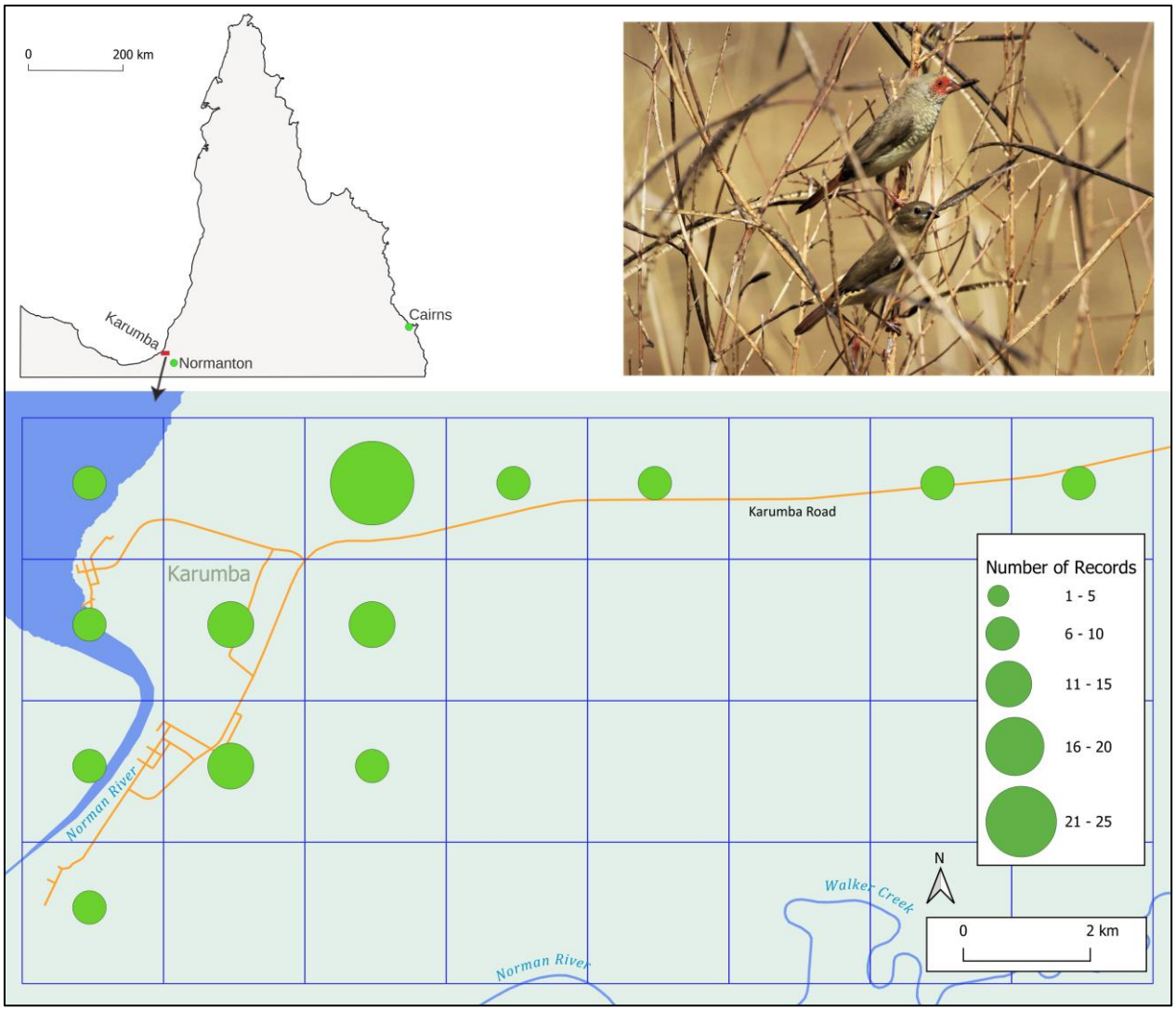

Figure 1. Map of the Karumba area, showing location and frequency of records of CYSFs in 1.2' x 1.2' cells. **Inset** photo: Adult female and juvenile CYSF next to waterhole on 24 June 2021 (Steven Edwards)

Karumba Road to Karumba Point, c.4 km NNE of the Post Office. Excluding 14 records from the same area in the same month, there were 51 records, the majority (58.5%) of which fell in the months from May to July (Fig. 2). Birds were found in the turnoff area mainly during the wet-dry transition period (April-May), while sightings in the township predominated during the mid-dry season. Sightings on the floodplain increased gradually over the dry season and predominated during the latter half of the dry.

CYSFs were recorded in 20 (87%) of the 23 years from 2000 to 2022, though the last three years accounted for 37.7% of records (Fig. 3). Only three sightings were made during the wet season: two in February 1991 (including the Shady Lagoon record) and one in February 2015 (Appendix 1). Of the 79 surveys conducted by the authors (RR and DH), only 17 (22%) yielded sightings of CYSFs. Although we failed to find the birds in three years (2016, 2017 and 2019), records by other observers confirm that small numbers were present (Fig. 3; Appendix 1). As these birds often perch low or even on the ground within dense clumps of long grass, particularly during the middle of the day, it is quite possible that we overlooked birds in those years.

Of the 66 records since 1991, 51 (77%) included counts or estimates of the number of individuals present, which varied widely from one to 350 (Appendix 1). About one-half (51%) of these counts were of one to nine

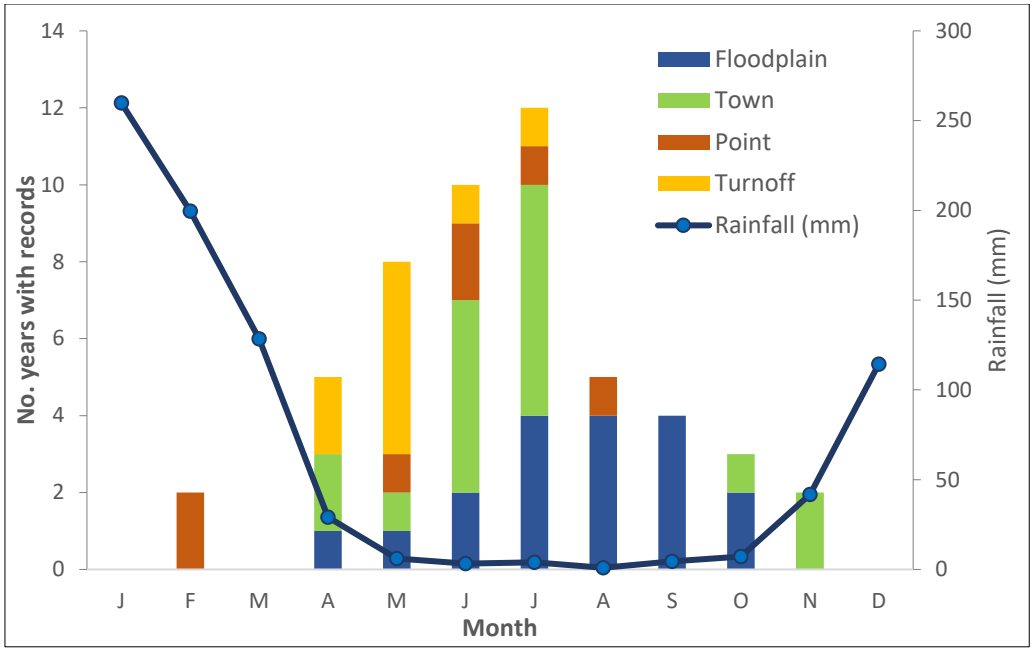

Figure 2. Number of years with records from four localities in Karumba region from 1991 to 2022, and monthly rainfall for Normanton airport (2004-2023; BoM 2024)

birds, while 12 counts (23.5%) exceeded 20. Ignoring singletons, the median group size was eleven (n=51). Considering the maximum count in each of 15 years, the median was 20 birds. Of the 51 counts, 20 (39%) included juvenile birds, which predominated in all but three cases. Juveniles were recorded in all months from April to September, but only in nine years (Appendix 1). Large flocks of 100 or more birds were recorded in four years, and were dominated by juveniles (flock size, followed by percentage of juveniles): in 2004, 300 (90%); 2014, 100 (90%); 2018, 250 (80%); and in 2020, 350 (80%). On 31 July 2011, P. Valentine watched one of two adults in a group of mostly sub-adult birds feeding four juveniles at a waterhole near the Karumba dumpsite (Birdata 2022).

Discussion

Records over the last two decades indicate a small resident population around Karumba,

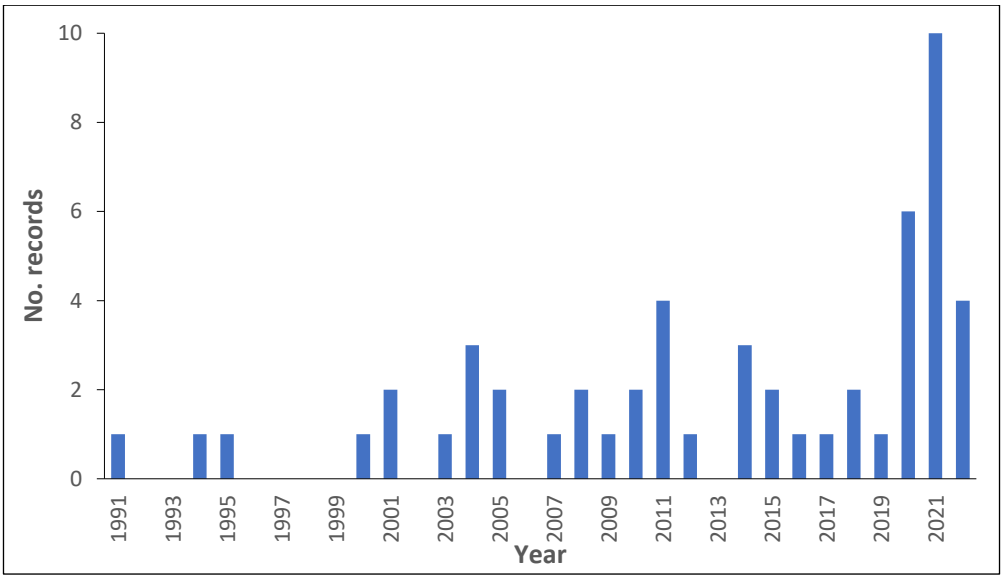

Figure 3. Number of monthly records per year in Karumba region from 1991 until the end of 2022.

Plate 2. Waterhole beside barbed-wire fence in wet season, 1 February 2023 (Rob Reed)

Plate 3. The same waterhole as in Plate 2 in the dry season, 10 September 2023 (Rob Reed)

with an adult population fluctuating between 24 and 70 birds from 2018 to 2022. Although large flocks of 250-350 birds were recorded in 2004, 2018 and 2020, the vast majority were juvenile birds which probably suffer high mortality during the late dry season. Two of these flocks were recorded in May 2004 and June 2020, respectively, corresponding with the early dry season when juveniles would be expected to occur, following breeding during the wet season. The spike in the number of records of CYSFs around Karumba from 2020 to 2022 (Fig. 3) reflects an increase in the number of visits to the area, especially by the authors while birding or leading bird tours, as well as by independent birders who use eBird or Birdata information to locate the species. It does not necessarily reflect an increase in the area's population, especially since sightings at the four major sites may involve the same group of birds.

The lack of sightings during the wet season (Fig. 2), when many areas inhabited by CYSFs are flooded, may be due to birds dispersing to other areas to feed on the seeds of annual grasses (see below) when water sources

are widespread. As the dry season progressed, the proportion of sightings from the Karumba floodplains increased (Fig. 3). The road verges on the Karumba floodplains extend c. 30 m to the barbed wire fences on the perimeter of the cattle stations (Plate 2), providing a long linear strip of tall (up to 2 m) dense grasses that are inaccessible to cattle, and which remains dense until reduced by wind or fire, or slashed by the local shire council. After the Karumba floodplains dried out (Plate 3), some birds apparently relied on waterholes in the town for drinking.

On the east coast of Cape York Peninsula, CYSFs remained in the Princess Charlotte Bay region through the dry season from June until late October, when they moved to saltbush-dominated coastal saltpans to feed on the seeds of the annual grass species, *Xerochloa imberbis* (Garnett *et al*. 2005). Although early wet-season observations at Pormpuraaw suggested that they feed primarily on the seeds of Beach She-oak *Casuarina equisetifolia* (Todd *et al*. 2003), they have also been seen 10 km south of Pormpuraaw on the fringes of *X. imberbis* communities and where no *C. equisetifolia* is present (K. Fisher in Garnett *et al.* 2005). Of the 890 birds banded in one area of the Wyndham district, Western Australia, 326 (37%) were recaptured over four years and the mean distance travelled was only 4 km, though inter-area movements averaged 10 km, and one juvenile moved 20 km in less than four months (Lewis & Lehrer 2015).

Flocks of CYSFs can contain many hundreds of birds during the dry season, when populations tend to be mainly comprised of juveniles, such as at Rinyirru/Lakefield National Park in August 1996 (Holmes 1998). In the Karumba region, juveniles were present in nine of the 13 years in which counts exceeded two birds, including the last five consecutive years (2018-2022), indicating successful breeding in the region in most years. Breeding has been confirmed at Princess Charlotte Bay and Pormpuraaw, but hitherto not at Karumba (Holmes 1998; Department of the Environment, 2022a). The observation of two adults feeding four juveniles at a waterhole near the Karumba dumpsite (Birdata 2022) suggests that at least part of the Karumba population breeds locally. We encourage visitors to the region to watch for and report any signs of breeding activity among CYSFs.

Conservation

One-third of the granivorous bird species that have declined since European settlement of the northern Australian savannas are finches, including the Star Finch (Franklin 1999). The declines were greatest in Queensland and were correlated most strongly with livestock grazing intensity (Franklin *et al.* 2005). Indeed, four of the eleven bird species that became regionally extinct in the Rockhampton region of coastal Central Queensland before 1975 were finches, including the Southern Star Finch, which was last seen in 1915 (Noske & Briggs 2021). Apart from over-grazing and the trampling of seasonally inundated habitats by livestock, heavy trapping for the bird trade may have played an important role in the extirpation of the species from the Rockhampton region (Holmes 1998). Given the chronicle of the Southern Star Finch, it is not surprising that there has been concern over the security of some populations of CYSFs.

In 2007, the populations of CYSFs were estimated with low reliability as c.3000 at Lakefield NP and c.500 at Pormpuraaw, with small numbers at Karumba and Aurukun (Dorricott & Garnett 2007). Apart from the large numbers banded at Pormpuraaw (see above), hundreds have since been seen on coastal floodplains and grassland around the Kirke River south of Aurukun (E. Vanderduys in Todd *et al.* 2021). Based on habitat area and recent counts of birds, Todd *et al.* (2021) estimated current population sizes as 5,000 at Lakefield NP; 3,000 at Aurukun; 2,000 at Pormpuraaw; and 1,000 at Karumba. While the invasion of coastal grassland by woody species such as Broad-leaved Paperbark *Melaleuca viridiflora* was formerly considered a threat to one subpopulation of CYSFs, this invasion has largely ceased (Todd *et al.* 2021). Similarly, the threat posed by pastoralism is no longer considered serious since the grazing pressure

on Lakefield NP and the coastal plains south of Aurukun is light (Todd *et al.* 2021), and as stated above, some habitat in the Karumba region is protected against grazing by fencing. In the future, rising sea levels may affect the saline herblands used by some populations at the start of the wet season (Garnett *et al.* 2005), but the importance of this habitat to the Karumba population remains unknown. Continued monitoring of this population is desirable to assess its viability over the long term.

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References

Atlas of Living Australia. 2022. https://biocache.ala.org.au/occurrences/search?q=taxa%3A%22star+finch%22#. Last accessed 1 February 2024.

Barrett, G., Silcocks, A., Barry, S., Cunningham, R. & Poulter, R. (eds) 2003. *The New Atlas of Australian Birds*. RAOU, Hawthorn East, Victoria.

Birdata. 2022. Birdlife Australia. https://birdata.birdlife.org.au/home. Last accessed 1 February 2024.

Birding-Aus. Mailing list archives 2022. http://bioacoustics.cse.unsw.edu.au/archives/html/birding-aus

Blakers, M., Davies, S.J.J.F. & Reilly, P. N. 1984. *The Atlas of Australian Birds.* Melbourne University Press, Victoria.

BoM. 2024. Recent and Historical Rainfall Maps. http://www.bom.gov.au/climate/maps/rainfall/?variable=rainfall&map=decile&period=12month&region=qd&year=2019&month=12&day=31 Accessed 1 February 2024.

Department of the Environment 2022a. *Neochmia ruficauda clarescens* in Species Profile and Threats Database, Department of the Environment, Canberra. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=67118. Accessed 1 February 2024.

Department of the Environment 2022b. *Neochmia ruficauda* in Species Profile and Threats Database, Department of the Environment, Canberra. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26027. Accessed 1 February 2024.

Dorricott, K.E & Garnett, S.T. 2007. National recovery plan for the white-bellied subspecies of the crimson finch *Neochmia phaeton evangelinae* and the Northern subspecies of the star finch *Neochmia ruficauda clarescens*. Report to the Australian Government Department of the Environment and Water Resources, Canberra. Queensland Parks and Wildlife Service, Brisbane.

eBird. 2022. eBird: An online database of bird distribution and abundance. Cornell Laboratory of Ornithology, Ithaca, New York. https://ebird.org Last accessed 1 February 2024.

Forshaw, J.M. & Shephard, M. 2012. *Grassfinches in Australia.* CSIRO Publishing, Collingwood, Victoria.

Forsyth, B. 2004. Birding Aus. Mailing list http://bioacoustics.cse.unsw.edu.au/archives/html/birding-aus/2004-05/msg00251.html. Last accessed 1 February 2024.

Franklin, D.C. 1999. Evidence of disarray amongst granivorous bird assemblages in the savannas of northern Australia, a region of sparse human settlement. *Biological Conservation* 90: 53–68.

Franklin, D.C., Whitehead, P.J., Pardon, G., Matthews, J., McMahon, P. & McIntyre, D. 2005. Geographic patterns and correlates of the decline of granivorous birds in northern Australia. *Wildlife Research* 32: 399–408.

Fulton, G.R. 2021. A detailed report on the birds collected on the Chevert Expedition to New Guinea, in 1875. *Proceedings of the Linnean Society of New South Wales* 143: 9-36.

Garnett, S.T., Clarkson, J.R., Felton, A., Harrington, G.N. & Freeman, A.N.D. 2005. The feeding ecology of the Star Finch *Neochmia ruficauda clarescens* at Princess Charlotte Bay, Cape York Peninsula, in the early wet season. *Emu* 105: 81–5.

Garnett, S.T., Szabo, J.K. & Dutson, G. 2011. *The Action Plan for Australian Birds 2010*. CSIRO Publishing, Melbourne.

Hall, B.P. 1974. *Birds of the Harold Hall Australian Expeditions, 1962-1970: a Report on the Collections made for the British Museum of Natural History*. British Museum (Natural History), London, UK.

Hartert, E. 1899. On Some Birds from Cape York North Queensland. *Novitates Zoologicae* 6: 423-428. Image available at archive.org: https://www.archive.org/download/novitateszoologi06lond/page/n474_w50.

Higgins, P.J., Peter, J.M. & Cowling, S.J. (Eds.) 2006. *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 7 Boatbill to Starlings.* Oxford University Press, Melbourne.

Holmes, G. 1996. Distribution and status of the Southern Star Finch. *Sunbird* 26: 49-59.

Holmes, G. 1998. A review of the distribution, status and ecology of the Star Finch *Neochmia ruficauda* in Queensland. *Australian Bird Watcher* 17: 278-289.

Lewis, J. & Leyrer, J. 2015. The movement and survival of Star Finches *Neochmia ruficauda subclarescens* in the Wyndham Region of Western Australia. *Corella* 39: 8-14.

Maher, P. 2011. Gulf of Carpentaria tour notes 14-27 May 2011. Published on-line: https://www.philipmaher.com/Gulf2011notes.html. Last accessed 1 February 2024.

Mortlock, R. 2014. The Drongo. *Birdlife Townsville Newsletter* 132, 6-7 April 2014.

North, A.J. 1901-1914. *Nests and Eggs of Birds Found Breeding in Australia and Tasmania*. Australian Museum, Sydney, NSW.

Noske, R.A. & Briggs, A. 2021. Species loss and decline among birds of coastal Central Queensland over 130 years. *Pacific Conservation Biology* 28: 427-443.

Todd, M.K., Felton, A. & Garnett, S.T. 2003. Morphological and dietary differences between common and uncommon subspecies of Crimson Finch *Neochmia phaeton* and Star Finch *Neochmia ruficauda* in Northern Australia. *Emu* 103: 141-148.

Todd, M.K., Vanderduys, E., Freeman, A. & Garnett, S.T. 2021. Cape York Star Finch *Neochmia ruficauda clarescens*. In *The Action Plan for Australian Birds 2020* (Eds. Garnett, S.T. & Baker, G.B.), pp. 783–785. CSIRO Publishing, Melbourne.

Part of a flock of Cape York Star Finches with adult males, females and immatures, Lakefield N.P. (Doug Herrington).

Appendix 1.

Locations, coordinates and dates of CYSF records, with numbers or estimates of adults and juveniles. Location: TO, Karumba town; FP, floodplain; IN, Karumba turnoff; PT, Karumba Point; SL, Shady Lagoon. Sources: ALA (2022); Atlas 2 (Barrett *et al.* 2003); Bd, Birdata (2022); eB, eBird (2022); Holmes (1998); authors, RR and DH; other names, pers. comm..

Year	Date	Location	Lat. (°S)	Long. (°E)	No. adults*	No. juv.#	Sources
1964	July	TO	17.482	140.843			ALA
1986	?	?	16.623	141.043			ALA[1]
1991	Feb	SL	17.735	141.104			Holmes
1991	21-Feb	PT	17.482	140.859			Holmes, ALA
1994	29-Jun	TO	17.482	140.859			Holmes, ALA
1995	14-May	PT	17.454	140.831	12		K.Uhlenhut
2000	4-May	IN	17.461	140.854			Atlas2, Bd
2001	15-Jul	PT	17.471	140.835			Atlas2, Bd[2]
2001	17-Jul	TO	17.488	140.842	14		Atlas2, Bd
2003	4-Oct	TO	17.450	140.911			Bd
2004	5-May	IN	17.459	140.859	3	12	Bd, eB
2004	9-May	IN	17.459	140.859	30	270	B.Forsyth
2004	4-Jun	TO	17.483	140.839			Bd
2004	25-Jun	IN	17.459	140.859	12		eB[3]
2004	4-Jul	TO	17.483	140.833			Bd
2005	20-May	IN	17.459	140.859	2	18	P.Maher
2005	11-May	TO	17.482	140.89			eB
2007	8-Aug	FP	17.456	140.868	1		Bd[2], eB, M.Hinze
2008	18-Jun	TO	17.489	140.837			Bd
2008	5-Nov	TO	17.489	140.837	2		Bd[2]
2009	15-Oct	TO-IN	17.473	140.855	2		eB
2010	10-Jun	TO-IN	17.469	140.85	4		Bd
2010	25-Jul	TO	17.494	140.836			Bd
2011	16-May	IN	17.459	140.859	3	27	P.Maher
2011	28-Jun	TO	17.4854	140.842			ALA
2011	4-Jul	TO	17.487	140.843	4		Bd
2011	16-Jul	TO	17.475	140.852	5	25	Bd, eB, G.Brosie
2011	17-Jul	TO	17.461	140.843	2		Bd[2], eB, G.Brosie
2011	31-Jul	IN	17.461	140.854	2	10	Bd, eB
2012	22-Apr	TO	17.482	140.89			eB
2014	23-Apr	TO	17.484	140.85	2	4	Bd, eB
2014	24-Apr	IN	17.459	140.859	10	30	R.Mortlock
2014	16-Jul	FP	17.449	140.953	10	90	P.Maher
2015	17-Feb	PT	17.463	140.83			Bd[2]

Year	Date	Location	Lat. (°S)	Long. (°E)	No. adults*	No. juv.#	Sources
2015	28-Apr	IN	17.459	140.859	1		Bd, eB
2016	17-Jun	IN	17.459	140.859	7		Bd, eB
2017	18-May	IN	17.459	140.859	6		Bd, eB
2018	23-Jun	PT	17.462	140.829	13		ALA, Bd
2018	22-Sep	FP	17.455	140.876	50	200	eB, authors
2019	11-Jun	PT	17.457	140.834	0	4	Bd, eB
2020	9-Jun	FP	17.455	140.876	8	22	Bd, eB, D.Mead
2020	27-Jun	FP	17.455	140.876	70	280	eB, authors
2020	4-Jul	FP	17.455	140.876	30	120	eB, authors
2020	22-Jul	FP	17.441	140.962	4		eB
2020	21-Jul	TO	17.485	140.84	3	10	eB, B.Deacon
2020	15-Aug	FP	17.455	140.876	2	6	eB, authors
2020	16-Aug	FP	17.455	140.876	4	11	eB, authors
2020	19-Sep	FP	17.455	140.876	3		eB, authors
2020	24-Oct	FP	17.455	140.876	2		eB, authors
2021	17-Apr	FP	17.455	140.876	5		eB, authors
2021	22-May	FP	17.455	140.876	2		eB, authors
2021	7-Jun	TO	17.482	140.84	2		Bd
2021	24-Jun	FP	17.455	140.875	3	1	eB, B.Deacon
2021	3-Jul	FP	17.455	140.876	8		eB, authors
2021	22-Jul	TO	17.455	140.876	2		eB,Bd[2]
2021	28-Jul	FP	17.450	140.901	3	1	eB
2021	7-Aug	FP	17.455	140.876	7	20	eB, authors
2021	25-Aug	PT	17.46	140.830			Bd, eB
2021	11-Sep	FP	17.455	140.876	11		eB, authors
2021	16-Oct	FP	17.455	140.876	60		eB, authors
2022	2-Jul	FP	17.455	140.876	1		eB, authors
2022	3-Aug	FP	17.455	140.876	11	2	eB
2022	3-Aug	FP	17.455	140.876	24		eB
2022	4-Aug	FP	17.455	140.876	2		eB
2022	22-Sep	FP	17.452	140.895	18		eB, authors
2022	4-Nov	TO	17.507	140.823	20		eB
2022	5-Nov	TO	17.507	140.823	8		eB, authors
2022	6-Nov	TO	17.507	140.823	2		eB, authors

* Number may include juveniles if no distinction made.

Number or estimate assuming a majority is equivalent to 75% of total.

1. Ford survey; erroneous coordinates indicating location 20 km off coast at Gilbert River mouth.
2. “Sensitive survey – approximate location shown”. Detailed information provided from Bd upon request.
3. Marc Gardner (pers. comm.); original coordinates in eBird erroneous.