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A Review of the Distribution, Status and Ecology of the Star Finch *Neochmia ruficauda* in Queensland

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Summary

The Star Finch *Neochmia ruficauda* has been recorded in 35–37 one-degree blocks in Queensland. Most records concern the Edward River, Princess Charlotte Bay and Rockhampton districts. Viable populations are probably now restricted to Cape York Peninsula. Typical habitat comprises grasslands or grassy open woodlands, near permanent water or subject to regular inundation. Some sites support shrubby regrowth caused by the clearing of formerly unsuitable denser woodlands. Recorded food items are all seeds, of five grass species and one sedge. Precise nest records are few, but large numbers of juveniles have been observed during the last two decades at Aurukun, Pormpuraaw, Kowanyama and Princess Charlotte Bay. Threatening processes are discussed; livestock grazing in riparian situations is considered the most deleterious.

Introduction

The distribution, status and ecology of the Star Finch *Neochmia ruficauda* in Queensland require urgent review. Endemic to northern and eastern Australia, its populations have declined in most regions. Available evidence suggests that the greatest contraction in its distribution has occurred in Queensland (e.g. Blakers et al. 1984). It is extinct in New South Wales, but its distribution there was only of limited extent (Holmes 1996).

The Star Finch is protected stringently in Queensland because it is gazetted as Endangered under the *Nature Conservation Act 1992*. This categorisation takes due account of 'biological vulnerability, extent of current knowledge... and management needs'.

Methods

This study was designed initially to extend the survey of the Southern Star Finch *N.r. ruficauda* reported by Holmes (1996). Similar procedures were adopted, but the area of coverage was enlarged. It encompassed the region bounded by Mt Garnet (block 17/145), Karumba (17/140), Gregory River (18/138), Boulia (22/139), Winton (22/143), Barcaldine (23/145) and Rockhampton (23/150).

However, observations were also conducted at the most accessible location for Star Finches that is known, round Princess Charlotte Bay (14/143). Although it was confirmed that this population represents the more brightly coloured Northern Star Finch *N.r. clarescens*, opportunities were taken to record food plants and habitat type, mainly to assist study of the Southern Star Finch.

Survey procedure for *N.r. ruficauda* was essentially intuitive and opportunistic. From April 1996 to March 1997, traverses within the region delimited above were conducted at moderate vehicle speed according to road conditions and traffic (c. 50–80 kph sealed roads, 25–50 kph unsealed). When any finch species was detected, or permanent water sources were encountered, surveys on foot were conducted for a minimum of 10 minutes.

The study was publicised widely. In particular, posters requesting assistance were displayed throughout the survey region, mainly on public noticeboards at shire, city council, postal and state government offices. Information given on the poster was also published wholly or in part by the newsletters of various organisations, including the Queensland Ornithological Society, Royal Australasian Ornithologists Union, Bird Observers Club of Australia and Queensland Finch Society.

Concurrently, a network of informants increased in size gradually until it comprised 79 persons. This was to assist rapid reporting or to conduct local investigations, should Star Finches be located incidental to the routine bird-observing activities of the participants.

Finally, the study incorporated a review of records throughout the state, commissioned as part of a development proposal in north-eastern Queensland (a gas pipeline from Torres Strait through

Townsville to Gladstone). Access to botanical and faunal data from other commissioned studies helped to predict the types of potential habitat for Star Finches on Cape York Peninsula and in central Queensland.

Correspondingly, the results of my surveys are given the most appropriate context by presenting them here within the relevant sections of this review.

Conservation status

The status of the Star Finch in Queensland has been reviewed most comprehensively by Holmes (1996). However, this review concerned only those populations identified with the Southern Star Finch *N.r. ruficauda*. Populations of Cape York Peninsula identified with the Northern Star Finch *N.r. clarescens* were reviewed briefly by Garnett (1992). The current review documents the first detailed assessment of status for the species throughout Queensland. Historical and recent records are available for a total of 35–37 one-degree blocks between 12° and 27°S and 139° and 152°E (Appendix 1).

These records show that the Star Finch was once distributed throughout most of Queensland, excluding only the south-western arid lands. Data presented by the Atlas of Australian Birds (see Blakers et al. 1984, pp. 593, 669) indicate that the decline has been more marked in Queensland than in the Northern Territory or Western Australia. Of the 89 records documented for the present review, highest numbers were near the Edward River (block 14/141, 13 records), Princess Charlotte Bay (14/143, 12) and Rockhampton (23/150, 10). During the last decade there has been a moderate number of records, concerning 18 one-degree blocks (Appendix 1).

On Cape York Peninsula the Northern Star Finch is still numerous locally. Aggregrations sometimes exceeding 500 birds have been observed at a few locations on the west coast (e.g. Garnett & Bredl 1985; A. Gillanders, D. McGowan, R. Buckley, K. Kendall pers. comm.). Numbers seem less round Princess Charlotte Bay. The present study recorded groups on 9 August 1996 at four locations within a linear distance of 35 km: Marina Plains (c. 60), Nifold Plain (40–60), Hann Crossing (4) and Blue Lagoon (65–70) (Appendix 2). Immature birds predominated, as only 25–35 adults were detected.

By contrast, the Southern Star Finch *N.r. ruficauda* is critically endangered. Holmes (1996) enumerated only 24 acceptable records. During the last two decades there were only six, all in central Queensland between 21° and 25°S and 141° and 150°E. Another six records were considered likely, but uncertain because they could represent *N.r. clarescens* or even aviary escapes. Perhaps the most plausible were two in the Mt Surprise district. Since then there have been other acceptable reports, obtained through the network of informants. The most recent concern a record of 15–20 birds in September or October 1994 within the township at Aramac, and another of 12 birds in August 1995 at Buneru Rd near Wowan. A historical record concerns a small population that inhabited the Namoi River at Narrabri in New South Wales, close to the type locality, until at least 1945 (R. Smith per C. Kent pers. comm.). This is consistent with a report at Roma about 1932 (Cayley 1932) that was overlooked or rejected by Blakers et al. (1984). For the purpose of the current review it was considered acceptable (Appendix 1).

Occurrence in conservation reserves is poorly documented. The most accessible population in Queensland occurs mainly within the northern section of Lakefield National Park. Potential locations in reserves elsewhere include Archer Bend, Mitchell and Alice Rivers and Staaten River National Parks. It seems unlikely that the Southern Star Finch occurs within reserves.

Recent survey

A total of 14 species of estrildine finches was recorded during the survey in 1996–97, resulting from 141 site counts. The 29 site counts presented here (Appendix 2) were selected according to the presence of the following:

(a) a total of four or five finch species (8 sites);
(b) at least one species of *Neochmia* (24 sites);
(c) the Painted Finch *Emblema pictum* (3 sites), because it resembles the Star Finch in its ecological requirements when occurring in arid environments with seasonal rainfall patterns (judged by their largely coincident distribution in the Pilbara region, see Blakers et al. 1984, and their coexistence in north-western Queensland, e.g. Cloncurry, Middleton, Winton).

No Southern Star Finches were encountered. At sites where Northern Star Finches were recorded, four other species were present and aggregated loosely with them (except at Marina Plains). In various combinations these associates were Crimson Finch *N. phaeton*, Double-barred Finch *Taeniopygia bichenovii*, Black-throated Finch *Poephila cincta*, Masked Finch *P. personata* and Chestnut-breasted Mannikin *Lonchura castaneothorax* (Appendix 2).

Movements

Limited study indicates that the Star Finch is sedentary. It is reported that marked birds are retrapped at the site of capture more frequently than for other finches (Tidemann 1987). Even so, the regular formation of large flocks is probably associated with at least some localised movements. For example, Boekel (1980) recorded Star Finches at a subcoastal location in the Northern Territory only during the non-breeding season. In Queensland at Pormpuraaw, Garnett & Bredl (1985) recorded that it was continuously present within a limited area.

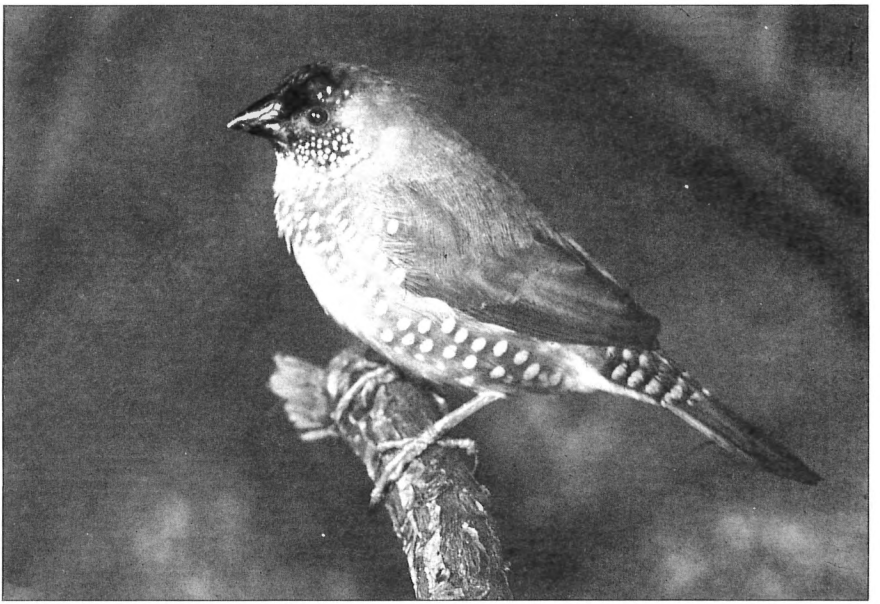
The geographic pattern of plumage variation is also consistent with sedentary behaviour. The recognition of two subspecies and a high degree of individual variation (e.g. Immelmann 1982) suggest that regional populations seldom interact. Greater gene dispersal is likely to result in more uniformity. Moreover, the distributional data (Appendix 1) indicate that variation is possibly clinal, since there is no apparent geographic separation of *ruficauda* and *clarescens* (see Holmes 1996).

Habitat

The Star Finch occupies mainly grasslands or grassy open woodlands near permanent water. The grasslands are typically interspersed with shrubs or small trees. Expansive areas without woody plants are not frequented. Watercourses and swamps where Star Finches occur are typified by reeds, rushes and rank grasses (e.g. Immelmann 1982).

Holmes (1996) described vegetation at nine former locations of the Southern Star Finch. Sites were mainly woodlands, dominated by trees associated closely with permanent water or areas of regular inundation. The most frequent were Coolibah *Eucalyptus coolabah*, Forest Red Gum *E. tereticornis*, Carbeen *E. tessellaris*, Weeping Paperbark *Melaleuca leucadendra*, River Red Gum *E. camaldulensis* and River She-oak *Casuarina cunninghamiana*.

The sites at Wowan and Aramac (see Appendix 3) both differed greatly from others described by Holmes (1996). At Wowan (near west end of Buneru Rd) the site is undulating, vegetated originally by eucalypt woodland interspersed with vine forest. Currently it is mainly cleared, with shrubby regrowth scattered through grasslands.



Star Finch *Neochmia ruficauda*, **northern subspecies**

Plate 37 Photo: B. & K. Richards

Double-barred Finches *Taeniopygia bichenovii*

Plate 38 Photo: Bob Shepherd

Male Plum-headed Finch *Neochmia modesta*

Plate 39 Photo: Bob Shepherd

Chestnut-breasted Mannikin *Lonchura castaneothorax*

Plate 40 Photo: Bob Shepherd

Table 1

Food plants of the Star Finch near Princess Charlotte Bay, Queensland, 1996.

Plant species	*Date*	*Location*
Grasses		
Arundinella nepalensis	30/5/96	Marina Plains
Digitaria sp.	9/8/96	Marina Plains
Panicum laevinode	23/5/96	Nifold Plain
	26/5/96	Marina Plains
	29/5/96	Nifold Plain
Setaria apiculata	30/5/96	Marina Plains
Sedge		
Fimbristylis sp.	9/8/96	Blue Lagoon

Despite the predominance of grazing effects, road verges protect extensive but linear areas of tall dense grasses. Permanent water is supplied by bores.

At Aramac the site comprises the township and immediate environs, an area of about 100 hectares. In a pastoral region and with drought prevailing, this site would provide the best habitat available for finches. The township is rural in appearance, with many vacant blocks and animal enclosures (mainly for horses). Grasses are permitted therefore to seed prolifically. Moreover, there is abundant shrubbery and even small remnants of original vegetation. This is sufficient to support birds such as the Variegated Fairy-wren *Malurus lamberti* that are not present normally round habitation. Permanent water is also freely available from bores, so excess surface water is common.

The site at Mt Surprise (see Holmes 1996) is also a township, but much smaller than Aramac. The environs resemble more closely the Wowan site, where mainly cleared eucalypt woodland supports shrubby regrowth scattered through grasslands.

A total of at least 36 grass species was recorded at these and the other two most recent sites (near Winton and Middleton) identified with the Southern Star Finch (see Appendix 3). Genera recorded most frequently were *Sporobolus, Aristida, Eragrostis, Heteropogon, Cenchrus* and *Chloris*. Foraging data (e.g. Table 1) are insufficient to establish a correlation with food plants.

Habitat on Cape York Peninsula has not been studied rigorously. Most recent records of Star Finches there are coincident with the grassland community described by Pedley & Isbell (1971). In this community near Princess Charlotte Bay the grasses *Sporobolus virginicus, Dichanthium* sp., *Panicum maximum, Xerochloa imberbis, Oryza australiensis* and the sedge *Fimbristylis littoralis* are conspicuous. Near Pormpuraaw *P. decompositum, P. trachyrhachis* and *Eriochloa procera* are frequent. At this location, Garnett & Bredl (1985) reported that from July to October a large flock roosted in rushes *Typha* sp. and foraged in burned areas and residual patches of tall grass. At Kowanyama it has been reported that the birds often occupy groves of Horsetail She-oaks *Casuarina equisetifolia* between bouts of foraging (R. Buckley pers. comm.).

Recent intensive botanical survey of Cape York Peninsula by Neldner & Clarkson (1995) makes it possible to predict the vegetation formations occupied by Star Finches there. They described 30 broad vegetation groups (BVG). Seven are likely to provide suitable habitat at least seasonally, judged mainly by their coincidence with documented Star Finch locations. These groups are as follows:

BVG 7 — woodlands and open-woodlands dominated by *Eucalyptus chlorophylla,*

E. microtheca and *E. acroleuca* (e.g. Blue Lagoon, ?Strathburn)
BVG 8 — woodlands and open-woodlands dominated by *E. clarksoniana, E. novoguinensis* or *E. polycarpa* (e.g. Hann River, ?Strathburn)
BVG 18 — low open-woodlands and low woodlands dominated by Broad-leaved Paperbark *Melaleuca viridiflora* on depositional plains (e.g. Marina Plains, Nifold Plain)
BVG 21 — tussock-grasslands on marine and alluvial plains (e.g. Marina Plains, Nifold Plain, Aurukun, Edward River/Pormpuraaw, Kowanyama)
BVG 23 — tussock grasslands on longitudinal drainage depressions (e.g. Edward River)
BVG 25 — woodlands and herblands on beach ridges and the littoral margin (e.g. Marina Plains, Port Stewart, Kowanyama)
BVG 27 — sedgelands, lakes and lagoons (e.g. Nifold Plain, Blue Lagoon)

Food

Published dietary studies concerning wild Star Finches are imprecise. Gould (1865) reported the seeds of grasses and herbs as food. Lepschi (1997) identified seeds of the grass *Chloris barbata* in one instance. In Queensland, Garnett & Bredl (1985) recorded *Heteropogon* and other grasses with large seeds as food sources.

Personal observations during 1996 within and near Lakefield National Park recorded birds eating both standing and fallen seed. The plant species concerned were four grasses and a sedge (Table 1). At Marina Plains the grasses had been grazed heavily by livestock to a mainly short sward, but at Nifold Plain were about a metre tall and mostly dense. At Blue Lagoon the sedge *Fimbristylis* was distributed sparsely as small desiccated plants on the dry margins of a receding swamp.

Nesting

Because of its sedentary habit, the Star Finch has been recorded nesting throughout its geographic distribution. Large numbers of juveniles have been observed during the last two decades at Aurukun, Pormpuraaw, Kowanyama and Princess Charlotte Bay (see Appendix 1 for data sources).

Descriptions of nest-sites in Queensland are few. At the Archer River, MacGillivray (1918) reported one in a eucalypt sapling about a metre above the ground. Near Cardwell, Barnard (1926) observed many nests, situated about 3–10 m high in trees near swamps. Near Taroom, J. Gilbert (in diary, Mitchell Library) described one site in a sedge and another in tall grass, both beside water.

Breeding coincides with the wet season. Dated nest records are from November to April (Storr 1973).

Threatening processes

The current endangerment of the Star Finch in Queensland probably results from several processes. Like many birds in Australian woodlands (see Robinson & Traill 1996), it is most plausible that the species has declined because of pervasive changes in land use.

Livestock grazing is almost certainly the most significant factor (Garnett 1992). Habitat degradation during the dry season or drought would be especially marked near water sources. Since it is grasses and low shrubbery near watercourses and swamps that support the Star Finch, its foraging and nesting sites would be overgrazed and trampled.

Garnett (1992) suggested that the effects of grazing may be compounded by invasive weeds. In particular, many parts of northern and eastern Queensland are presently infested by Rubber Vine *Cryptostegia grandiflora*. It is so prolific that riparian vegetation can be smothered rapidly (Parsons & Cuthbertson 1992).

Trapping for the bird trade probably caused only temporary localised effects. Certainly thousands of Southern Star Finches were captured legally this century. The main source of birds was most likely the Rockhampton region. The practice ceased in the 1960s when more brightly coloured Northern Star Finches from the Kimberley became readily available (per bird trappers). Because of interbreeding or culling it seems that only highly coloured birds persist in captivity (B. Hutchins pers. comm.).

Mining activity may be deleterious when pondages associated with tailings treatment become contaminated. Cyanide used in gold-mining operations is especially injurious (Ryan & Shanks 1996). There are several anecdotal reports of thousands of finches dying round mine pondages near Croydon in the 1970s. Although it is unlikely that the Star Finch was concerned at that location, it shows the potential for lethal effects.

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Appendix 1

Locations of Star Finch in Queensland. This is an indicative list of records, not an exhaustive review. It is intended, however, to show at least one record from all one-degree blocks throughout the geographic distribution. *nesting location, #aviary escapes? HS = homestead, Am. Mus. Nat. Hist. = American Museum of Natural History, Mus. Vic. = Museum of Victoria, Aust. Mus. = Australian Museum.

Block	*Location*	*Date*	*Source*
12 141	Pennefather R.	1993?	D.M. per G. Holmes
13 141	Archer R./Watson R.	06–07/14	MacGillivray (1917–18)
	Archer R./Watson R.*	13–22/04/15	MacGillivray (1917–18)
	Aurukun, 20 km SW	09–10/92	C. & D. Frith
13 143	Chester R.	14/6/1898	Storr (1984), Cayley (1932)
14 141	Edward R.?	1/05/28	RAOU Atlas
	Edward R.	24/09/28	Thomson (1935)
	Kendall R./Knox Ck	?/11/65	A.Gillanders
	Pormpuraaw	1974–82	R. Bredl
	Pormpuraaw	?/12/79	Garnett & Bredl (1985)
	Pormpuraaw	03–10/80	Garnett & Bredl (1985)
	Pormpuraaw	?/03/81	Garnett & Bredl (1985)
	Pormpuraaw	?/06/81	Garnett & Bredl (1985)
	Pormpuraaw	?/10/83	Garnett & Bredl (1985)
	Pormpuraaw	1990?	A. Gillanders
	Pormpuraaw	9/09/91	G. Beruldsen
	Pormpuraaw	1991?	R.B., D.M. per G. Holmes
	Pormpuraaw	18/09/92	P. Venables
14 142	Strathgordon?	9/10/28	RAOU Atlas
	Strathburn	1991?	D.M. per G. Holmes
14 143	Artemis, ?Windmill Ck	6/06/69	L. Robinson
	Marina Plains	07–08/71	L. Robinson
	Nifold Plain	1/08/87	D. Storch
	Marina Plains	?/06/90	A. Mulder
	Marina Plains HS	1990–96	D. Low
	Nifold Plain	05–09/95	K. Uhlenhut
	Nifold Plain	11/06/95	D. Storch
	Nifold Plain	05–08/96	G. Holmes
	Marina Plains, 1 km SE HS	05–08/96	G. Holmes
	Nifold Plain	15/06/96	D. Storch, B. Venables
	Marina Plains, 4.5 km SE HS	30/05/96	G. Holmes
	Port Stewart, north bank	20/06/96	R. Giffard
14 144	Hann R./Nth Kennedy R.?	07/77–12/78	RAOU Atlas
	Nth Kennedy R.	27/05/95	K. Uhlenhut
	Bizant, Blue Lagoon	9/08/96	G. Holmes, E. Sticklen
	Hann R. crossing	9/08/96	G. Holmes, E. Sticklen
	Hann R. crossing	20/09/96	D. Harper
15 141	Kowanyama?	3/10/80	RAOU Atlas
	Rutland Plains	1990?	K. Kendall
	Kowanyama	1990?	R.B. per G. Holmes
	Kowanyama	21/09/92	P. Venables

Appendix 1 continued

Block	*Location*	*Date*	*Source*
16 141	Inkerman	30/05/64	Hall (1974)
16 142	Kingfish Lagoon	?	Storr (1973)
17 138	Nicholson R., Doomadgee	26/06/86	D. Stewart, G. Holmes
17 139	Armraynald	1990?	per W. Robertson
17 140	Karumba airport	21/02/91	G. Beruldsen
	Karumba	29/06/94	R. & P. Hallett
	Karumba, town entrance	14/05/95	K. Uhlenhut
17 141	Normanton?	before 1889	RAOU Atlas
	Shady Lagoon	?/2/91	G. Beruldsen
18 140?	Flinders R.?	before 1906	North (1906–09)
18 144	O'Briens Ck gemfields, access rd	10/07/81	C. Allamby
	Mt Surprise, caravan park	?/10/95	P. Wallace
18 146	Rockingham Bay	12/01/04	Mus. Vic.
	Cardwell*	1925–26	Barnard (1926)
19 140?	Flinders R.?	before 1906	North (1906–09)
20 139	Mt Isa	1990?	P. Harris
20 140	Cloncurry	1880s	MacGillivray (1901)
	Cloncurry	before 1906	North (1906–09)
	Cloncurry, west side	11–12/08/76	A. Hunt
20 145	Flinders Hwy, nr Pentland	1960s	R.B. per G. Holmes
20 148	Bowen	before 1915	Aust. Mus.
	Bowen, Mullers Lagoon#	?/08/70	R. Johnstone
	Bowen, township#	11/01/90	I. Burrows
21 146	Rosetta Ck, Bundoba Lagoon	14–15/10/88	D. Cameron
21 148	Connors R., Boothill Ck	?/05/85?	R. Whalan
22 141	Archervale, Shady Dam	?/07/93	J. Young
22 142	Surprise Ck, Winton-Jundah Rd	25/05/92	K. & L. Fisher
22 145	Aramac, hotel grounds	09–10/94	E. Corney
22 147	Sandy Ck, ?Pink Lily Lagoon	?/?/76	D. Stewart
22 149	Ogmore, nr Mt Brunswick	1980?	C. Horan
23 149	Mackenzie R., Bingegang Weir	?/05/75?	E. Zillman
23 150	Rockhampton	before 1866	Diggles (1866–70)
	Rockhampton	before 1867	Mus. Vic.
	Fitzroy Vale	28/02/1882	Am. Mus. Nat. Hist.
	Rockhampton	?/?/1897	Am. Mus. Nat. Hist.
	Dunrobin nr Yaamba	before 1912	Aust. Mus.
	Rockhampton	before 1915	Aust. Mus.
	Rockhampton, Kawana#	1972–75?	C. Doblo
	Rockhampton, Lion Lagoons#	?/11/91?	A. Taplin
	Alton Downs#	?/07/93	per G. Porter
	Wowan, Buneru Rd	?/08/95	C. Kent
23 151	Port Curtis	before 1866	Diggles (1866–70)
24 144	Emmet	?/08/78	RAOU Atlas
24 145	Barcoo R., Blackall	?/02/32	Marshall (1932)
24 148	Lake Brown	24/12/1844	J. Gilbert (diary)
25 149	Juandah Ck nr Clonduff*	10/11/1844	J. Gilbert (diary)
	Robinson Ck, Verbena Park*	18/11/1844	J. Gilbert (diary)
26 148	Roma	?/02/32?	Cayley (1932)

Appendix 2

Finch species recorded for selected site counts for Star Finch Study. A total of 29 counts selected from 141 site counts of finch species. Counts excluded if less than four finch species present or if no *Neochmia* species or Painted Finch. Abbreviations: S = Star Finch *N. ruficauda*, **C = Crimson Finch** *N. phaeton*, **R = Red-browed Finch** *N. temporalis*, **P = Plum-headed Finch** *N. modesta*, **D = Double-barred Finch** *Taeniopygia bichenovii*, **Z = Zebra Finch** *T. guttata*, **B = Black-throated Finch** *Poephila cincta*, **M = Masked Finch** *P. personata*, **A = Painted Finch** *Emblema pictum*, **G = Gouldian Finch** *Erythrura gouldiae*, **H = Chestnut-breasted Mannikin** *Lonchura castaneothorax*, **N = Nutmeg Mannikin** *L. punctulata*. **Note: only other finch species encountered were Long-tailed Finch** *P. acuticauda* **and Pictorella Mannikin** *Heteromunia pectoralis*.

Date	*Block*	*Location*	*S*	*C*	*R*	*P*	*D*	*Z*	*B*	*M*	*A*	*G*	*H*	*N*
5/04/96	18 143	Cumberland Dam/Log Ck					x		x	x		x		
8/04/96	18 143	Cumberland Dam					x		x	x		x		
21/04/96	18 145	Herbert R. nr Cashmere			x		x							
23/05/96	14 143	Nifold Plain	x				x		x	x			x	
26/05/96	14 143	Marina Plains	x				x							
29/05/96	14 143	Nifold Plain	x						x	x				
30/05/96	14 143	Marina Plains	x						x					
15/07/96	18 145	Tully/Cardwell		x									x	
15/07/96	18 146	Cardwell/Rollingstone		x									x	
17/07/96	20 142	Richmond/Julia Ck				x		x					x	
18/07/96	20 140	Chinaman Ck Dam						x			x			
19/07/96	18 139	Gregory Downs		x				x		x				
20/07/96	18 138	Lawn Hill Ck		x			x	x						
21/07/96	18 138	Lawn Hill Ck		x			x							
21/07/96	19 138	Riversleigh		x										
22/07/96	20 139	Lake Moondarra						x			x			
24/07/96	22 141	Archervale (Shady Dam)						x			x			
8/08/96	14 143	Marina Plains	x				x							
9/08/96	14 143	Marina Plains	x				x		x					
9/08/96	14 143	Nifold Plain	x				x						x	
9/08/96	14 144	Hann Crossing	x				x		x	x			x	
9/08/96	14 144	Blue Lagoon nr Bizant	x	x			x		x	x				
10/08/96	14 144	Kalpowar Crossing			x		x		x					
19/08/96	18 145	Cashmere/Blencoe Ck			x		x							
20/09/96	20 148	Bowen/Proserpine			x		x						x	
21/09/96	20 148	Peter Faust Dam			x									
25/09/96	23 150	Wowan				x	x	x						
29/09/96	19 147	Ayr Golf Course		x										x
30/09/96	19 147	Giru/Cromarty		x			x	x					x	

Appendix 3

Plants at five recent Southern Star Finch locations. Grasses and dominant plants at Wowan (birds recorded 1995), Aramac (1994), Mt Surprise (1995), Winton (1992) and Middleton (1993). Note that total flora noted for these sites comprised about 126 species. Asterisk denotes exotic species.

Species	*Wowan*	*Aramac*	*Mt Surprise*	*Winton*	*Middleton*
Grasses					
Aristida armata			x		
A. holathera					x
Aristida spp.	x	x			x

Appendix 3 continued

Species	*Wowan*	*Aramac*	*Mt Surprise*	*Winton*	*Middleton*
Grasses continued					
Bothriochloa ?bladhii			x		
B. decipiens	x				
B. ?ewartiana			x		
**Cenchrus ciliaris*	x	x			x
Chloris barbata		x			
C. ?divaricata				x	
**C. gayana*	x				
**Cynodon dactylon*	x	x			
Dactyloctenium radulans			x	x	
Dichanthium sericeum		x			
Digitaria ?bicornis			x		
Echinochloa colona					x
E. ?turneriana					x
Enneapogon ?intermedius					x
Eragrostis basedowii			x		
**E. cilianensis*	x		x		
E. tenellula			x		?
Eriochloa pseudoacrotricha		x			
Heteropogon contortus	x	x	x		
**Melinis repens*	x		x		
Oxychloris scariosa					x
Panicum ?laevinode		x			
P. maximum v. *trichoglume*	x				
Paspalum sp.	x				
Perotis rara			x		
Setaria apiculata			x		
**Sorghum halepense*	x				
Sporobolus actinocladus		x			x
S. australasicus			x	x	x
S. caroli	x	x			
**Themeda quadrivalvis*			x		
T. triandra	x				
**Urochloa panicoides*			x		
Other plants					
Eucalyptus camaldulensis		x			
E. cambageana	x				
E. coolabah				x	
E. crebra	x		x		
E. erythrophloia	x		x		
E. melanophloia	x				
E. tessellaris	x				
Acacia cambagei				x	x
A. farnesiana	x				
**A. nilotica*				x	x
Casuarina cristata	x				
Eremophila ?mitchellii		x			
Geijera parvifolia	x	x			
Santalum lanceolatum	x	x			
Alstonia constricta	x				
Owenia acidula		x			
**Ziziphus mauritiana*			x		