

Final draft

A SURVEY OF WHITE-BELLIED CRIMSON FINCHES AT KOWANYAMA, AUGUST 2016



Ray Pierce and Pam Schultz

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Frontespiece – a male White-bellied Crimson Finch at Kowanyama.

SUMMARY

We surveyed White-bellied Crimson Finches (WBCF) and other finches at Kowanyama in 16-22 August 2016. The WBCF was the second most common finch at Kowanyama averaging nearly two birds per hectare in surveyed sites. Groups of WBCF were in different life stages ranging from pairs with recently fledged young to flocks of up to 19 birds containing adults and independent juveniles. Detection rates of WBCF were highest in areas of riparian vegetation which also contained stands of grader grass and which also had water in close proximity. Much of this riparian habitat had been burnt this year, including large areas in July-August. A number of issues were identified that need to be addressed in the management plan for finches at Kowanyama and these include minimising impacts of fire on riparian habitat, managing grader grass and native grasses, managing the impacts of livestock and pigs, and monitoring the population of WBCF and their habitat.

1 BACKGROUND

White-bellied Crimson Finches (*Neochmia phaeton evangelinae*, Vulnerable) are endemic to Cape York Peninsula with concentrations in the Lakefield National Park area on the eastern side of the Cape and in the Kowanyama-Pormpuraaw area on the western side of the Cape (Higgins et al 2006, Dorricott and Garnett 2007, Freeman and Freeman 2007). During 16-22 August 2016 we undertook a survey of WBCF at Kowanyama in parts of the Mitchell River fluvial megafan, an area of 31,000 km² (Shellberg et al 2016). The area is one of Australia’s “Places of National Environmental Significance”, particularly noted for its roosting, breeding and feeding use by a diverse range of waterbirds (DEE 2016).

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The finch survey was designed to assist in developing a site management plan for the species at Kowanyama with reference to Dorricott and Garnett's (2007) national recovery plan.

2 SITES SURVEYED AND METHODOOOGY

Sites

“Kowanyama” means “place of many waters” (Sinnamon et al. 2008). The wider Kowanyama area comprises seasonally flooded rivers, creeks and associated wetlands separated by, *Eucalypt* open forests to woodlands on floodplains, *Melaleuca* open woodlands on depositional plains and tussock grasslands, forblands and riparian habitat (Appendix C), the latter becoming increasingly weedy with species such as grader grass (*Themeda quadrivalvis*). The area is managed by the staff and Rangers of the Kowanyama Aboriginal Land and Natural Resource Management Office (KALNRMO) who have a guiding management plan for the area (Sinnamon et. al 2008) as well as a five-year strategic plan (KALNRMO 2016). John Clark of the Kowanyama Indigenous Rangers, who also provided our site familiarisation, suggested the general focus of our survey sites.

A total of 23 specific sites were formally surveyed. These were located mainly in the catchments of Magnificent Creek and Gooseberry Creek and also in the vicinity of Kowanyama (Fig 1, Table 1).

Table 1 – Distribution of survey sites

Area	No. sites formally surveyed	Sites
Magnificent Creek	9 (+ 2 replicates)	From outskirts of Kowanyama to Lower Landing
Gooseberry Creek	11 (+1 replicate)	From Gooseberry Crossing area to Red Lily and Sandy Hole
Kowanyama	3 (+1 replicate)	Sewage Pond, Abattoir Wetland, Abattoir backroad

Some offsite finch surveys were also undertaken at Rutland Plains (2) and Oriners (10).

Methodology

The standard BirdLife Australia survey method of 2 ha x 20 minutes was trialled, along with point counts, and the former was adopted as the preferred survey method in this study. Typically this involved a 200 m x 100 m quadrant, which was surveyed by walking along the 200 m length. This involved walking the 200 m length parallel to the wetland and c.75 m from the water and returning along the water edge or close to it to it. This approach maximised the detection rates for finches that were foraging away from water and also for those coming to drink. Most finches were initially detected from their distinctively toned single or double-note calls, which were much louder in dependent juveniles that were begging for food from their parents.

We repeated surveys of several sites to test for consistency in results. Most surveys were completed by only one person (RP) and some by two people (RP and PS, the latter also doing habitat assessments) walking closely together. Point counts were also trialled and these involved a 20-minute survey at a single point, which combined the dual features of close proximity to water and potential feeding habitat. The results of point counts were compared with those for 20 minute counts. Impacts by livestock and pigs were also noted.

In addition, opportunistic observations were made while transiting via vehicle between survey sites.

3.0 RESULTS

3.1 Abundance and distribution

White-bellied Crimson Finches were common and widespread at Kowanyama, and of the six finch species found, WBCF were outnumbered only by Double-barred Finches (Table 2).

Table 2 – Finch species observed at Kowanyama

Species	Total no. sites	Minimum no. seen	Distribution
Double-barred Finch	19	171	Widespread including open habitats
White-bellied Crimson Finch	15 (19)	88	Widespread in Magnificent and Gooseberry Creeks, also Kowanyama township
Masked Finch	6	42	Widespread locations
Black-throated Finch	1	4	Sandy Hole
Chestnut-breasted Finch	2	18	Abattoir Wetland and Abattoir Backroad
Red-tailed Finch	1	4	Abattoir Backroad

At least 88 White-bellied Crimson Finches were observed. They were detected on most (19 of 23) of the 2 ha surveys between the township of Kowanyama and the middle reaches of Magnificent and Gooseberry Creeks (Fig 1). The 19 sites included four replicate sites. Very few finches were detected during the point counts. Up to 19 WBCFs were detected per 2 ha with the mean density being 3.6 birds per 2 hectares or 1.8 birds per hectare (with a range of 0 to 9.5 per ha, i.e. very high variation).

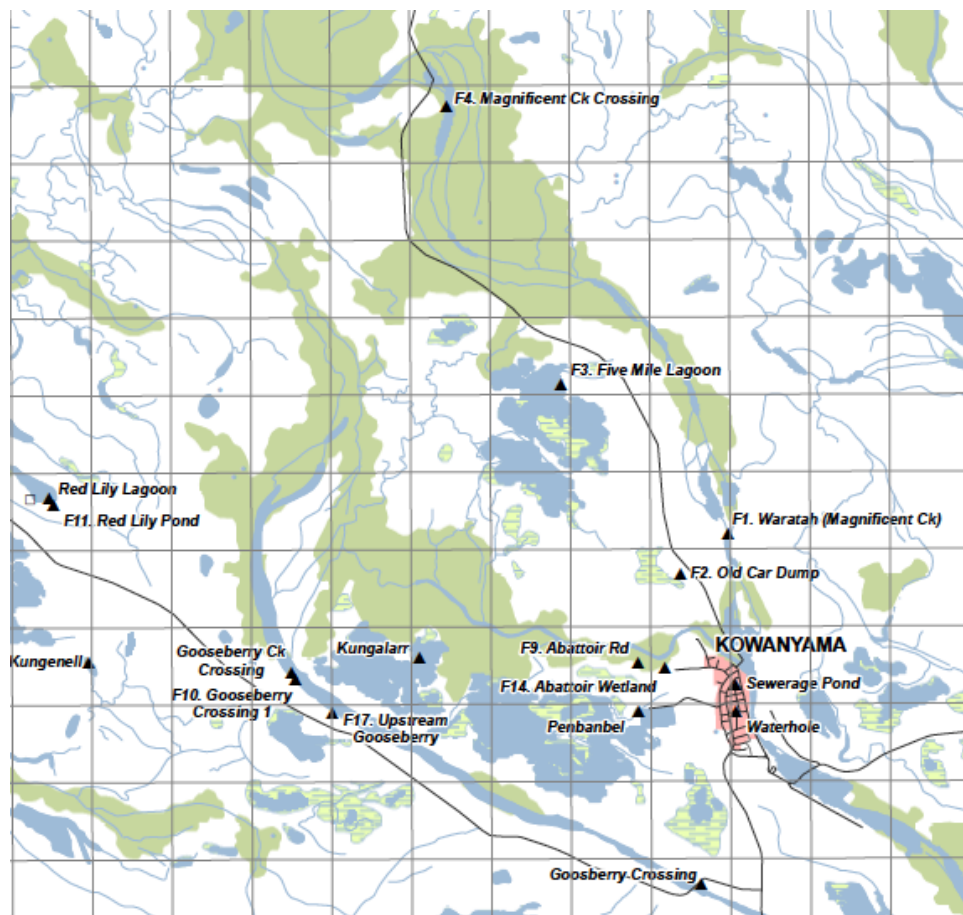


Figure 1 - Detail of Appendix A, showing the location of 15 of the 23 sites surveyed in and around Kowanyama

3.2 Habitat and feeding

All WBCF were seen in riparian or nearby lightly-wooded sites with varying levels of grasses and shrub cover. None were seen in open grassy areas which were often frequented by double-barred finches. There appeared to be some diurnal variation in habitat selection with a tendency for sites in the middle of the day to be well-shaded, e.g. mixed stands of grader grass (*Themeda quadrivalvis*) beneath Cathormion (*Cathormion umbellatum subsp. moniliforme*), *Barringtonia acutangula* (where finches were observed feeding on the flower buds), and paperbarks (*Melaleuca dealbata*, *M. leucadendra* and *M. clarksonii*), while early morning sites were often well away from significant shade. *Pandanus* spp. and *Corypha elata* (cabbage palm), important nesting trees for WBCF (Todd 2002), were scattered throughout the riparian zones, but were clearly coming under significant pressure from excessive fire (Fig 2).



Fig. 2- Burned riparian at Gooseberry Creek (left) and doomed *Corypha elata* (right) - note thin burnt base

The riparian area is dominated by large Melaleucas at the Magnificent Creek Crossing camping area (F4) supported a concentration of the native vine *Luffa aegyptiaca* or vegetable sponge (Beasley 2009) (Fig 3), thus providing good shelter for local finches generally (Appendix B).



Fig. 3 - The area of *Luffa aegyptiaca* at F4 and their fruit, leaf and flowers.

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Most feeding observations ($n = c.25$) of WBCF were of their taking seeds of grader grass mainly from erect or fallen stems. Also there was some consumption of unknown seeds from the ground in areas with burnt grader grass sometimes mixed with other burnt species (Fig 4). Some feeding on *Barringtonia* flower buds at 2-3 m elevation was also seen.



Fig. 4 – An entanglement of grader grass and shrubs provides cover, shade and feeding (left) while more open burnt areas beneath paperbarks also provide cover, shade and feeding opportunities.

The positive detections of WBCF corresponded with combinations of riparian vegetation, grader grass (unburnt to mostly burnt) and water being available within 100 m (Fig. 5). Some of the eight nil returns corresponded with poor habitat, e.g. open native grassland with poor shrub cover (two sites), nearly completely burnt grasses and shrubbery (one site at Red Lily Lagoon).



Fig. 5 - Burnt areas of grader grass had considerable surviving stands (left) or small remnants (right) all of which provided grass seed for WBCF.

3.3 Use of burnt areas in August 2016

Most of the WBCF habitat in the study area had burnt during 2016 (Fig. 6). There was no apparent correlation between the amount of recent burning (% surface area burnt) and the number of finches detected in 2 ha surveys (Fig. 7). For example, although the largest flock was found in an unburnt site at Magnificent Creek on day 1, most WBCF encounters were actually in sites that had 60-90% of grass recently burnt (Fig. 8).

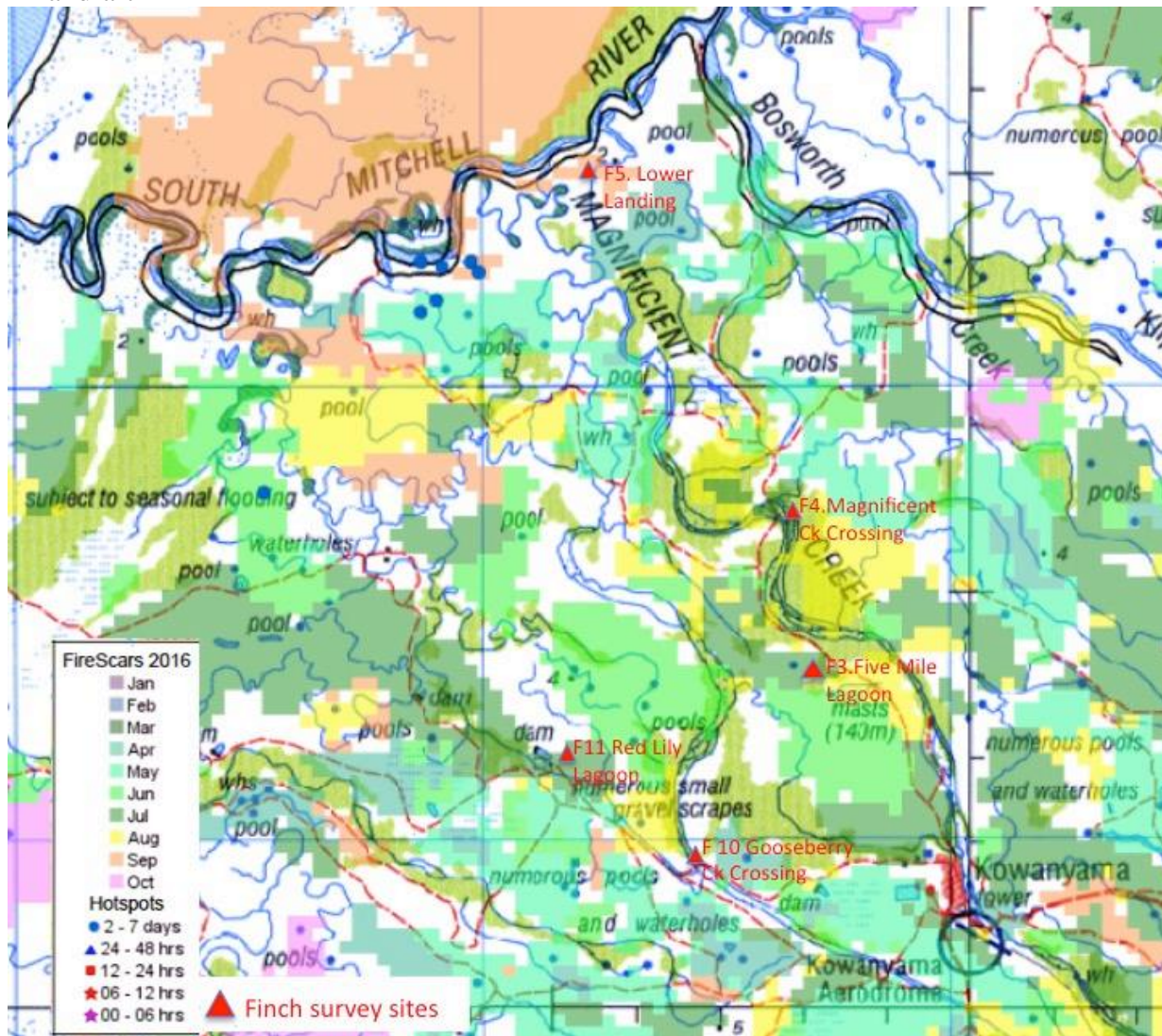


Fig 6 - A mosaic of historical burnt areas in January to October 2016 shows few unburnt areas (white) at Kowanyama

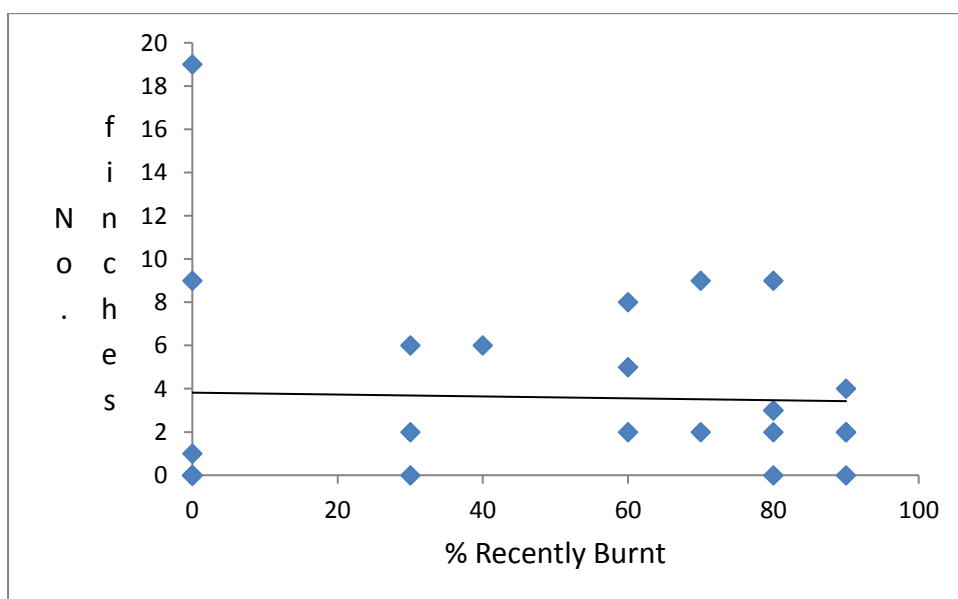


Fig 7 – Relationship between area burnt (% total area) and WBCF numbers detected in 2 ha surveys; trend line of best fitted included.

During our surveys and on returning to Magnificent Creek Crossing camp, where previously 19 finches were recorded a few days earlier, we came across an unattended fire (Fig. 8). Following this fire, we located nine finches.



Fig 8 - A site at Magnificent Creek Crossing camp being fired on 21 August 2016 (left) and right, a burn adjacent to F17 upstream Gooseberry Creek.

3.4 - Livestock and pig damage

Cattle, horses and pigs were utilising riparian areas and wetlands with significant impacts in many places, e.g. Five Mile lagoon (Fig. 9).



Fig. 9 – Recent pig (*Sus scrofa*) and older cattle impacts (left) and evidence that stock has entered the dam and disturbed the vegetation at Five Mile Lagoon.

3.5 Finch age structure

Of 88 observations, 69 (78%) were adults or sub-adults and 19 were juveniles. Birds were either in pairs, family parties or flocks. Family parties contained juveniles that were being fed by their parents; these dependent juveniles tended to remain at 2-4 m elevation within the dense cover of *B.acutangula*, Carthormion, a common multi-trunked shrub that supported climbing vines and other small trees and shrubs where they were fed (Fig. 10).



Fig. 10 - *Barringtonia* flower buds (left) and the deciduous *Carthormion* (right) with distinctive seed pod.

The WBCF flocks usually contained birds of mixed ages and sexes, with the juveniles appearing to be independent of their parents (Fig 11 & 12). The largest group of birds seen that lacked juveniles was a group of 2 males and four females. The overall proportion of juveniles (22%) seems modest for a small passerine species and may reflect less than optimal survival this breeding season.



Fig. 11 – Adult WBCF female (left) and male (right)



Fig. 12 - Recently fledged juvenile (left, note dark bill) and older juvenile (right) with reddish coloured bill.

DISCUSSION AND RECOMMENDATIONS

White-bellied crimson finches were common at Kowanyama during August 2016 and were focussed along watercourses and neighbouring woodland. With an average density of nearly 2 birds per hectare and the prevalence of water bodies during our visit, the population at Kowanyama appeared healthy. We sampled less than 10 % of potential habitat in the area so numbers of WBCF may number in the vicinity of 500-1000 birds at least, but more widespread sampling is needed to test this estimate.

The WBCF had a heavy dependence on grader grass during our survey. Seeds can last up to 4 years in soil (NQDT 2015) so it is likely that they are available to WBCF well into each wet season at least at Kowanyama. However, factors such as the nutritional benefits of grader grass in the diet of WBCF and the implications to the finches of grader grass displacement of native grasses remain unknown, but these are potentially significant. The proportion of juveniles observed (22%) seems moderately low for a passerine bird that has a clutch of 3-8 eggs (Higgins *et al.* 2006).

Burning is having a direct negative impact on some elements of WBCF habitat including killing and depletion of palms and Pandanus in the riparian areas. This issue needs addressing with relevant Kowanyama families and fire managers to ensure cooler fires are used and/or less frequently to minimise impacts on key nesting trees and grass species. Better awareness is needed in the community generally, including via schools, fact sheets, posters, videos, etc.

It was not clear how the repeated frequent burning of grader grass would impact on finch habitat. For example, the Magnificent Creek site with 19 birds on day one actually burned during the study period and a flock of 9 finches was sheltering in one of the few tiny remnants of grader grass the morning after the fire. Also it is not clear how long the grader grass could continue providing food for finches throughout this year and whether there would be sufficient growth of alternative grasses that could sustain finches. Grader grass seed can last up to 4 years in the soil so it is possible that this species has become a more important food for the finches at Kowanyama. There is a need to consider alternative and more integrated (and potentially experimental) options for management of grader grass and native grasses at Kowanyama using external advice (refer e.g. NQDT (2015)).

Stock fencing has been completed at Red Lily Lagoon. Other wetlands that appear to be suitable for livestock fencing include 5 Mile Lagoon, or part thereof if funds are limited, and dams such as the unnamed old dam about 4 km NW of Magnificent Creek Crossing (Appendix A). In all cases this should include as much of the

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adjacent riparian, savannah habitat as funds allow and re-establish water plants such as *Phragmites australis* (Common Reed) (see forthcoming WBCF Habitat Management Plan).

Pigs were seen at Five Mile Lagoon during this survey and pig sign was widespread and locally damaging throughout the survey area, including Red Lily Lagoon. Consideration needs to be given to combining pig exclusion in the above fencing although this would be more expensive to complete than stock fencing. This consideration will need to factor in the alternative approach and ability to suppress pigs by hunting.

Fencing needs to be accompanied by associated monitoring to measure the recovery of finch habitat and WBCF numbers – Red Lily Lagoon needs to be included in this monitoring regime, along with unfenced sites as reference “controls” to be identified in the local finch management plan.

Monitoring of finches is needed to measure the health of the population overall and determine responses to specific management, e.g. fencing, burning. Prescribed monitoring should be detailed in a management plan and be carried out annually by rangers and potentially the community. Some monitoring tools, e.g. binoculars, recording methods, are needed.

We recommend that the planned habitat management plan for Kowanyama finches include details of the following key components:

- Protection from fire of key nesting vegetation and trees (*Pandanus* and *Corypha*) in the riparian zone
- Integrated management of grader grass and native grasses and if necessary undertake prescribed management trials for this
- Fencing of key wetlands to exclude livestock (and possibly pigs)
- Increased suppression of pigs and their impacts
- Implementation of feral cat control if needed in future (currently low densities)
- Survey and monitoring of finches and their habitat including monitoring of responses to all of the above
- Raising awareness within Kowanyama community of finch habitat requirements.

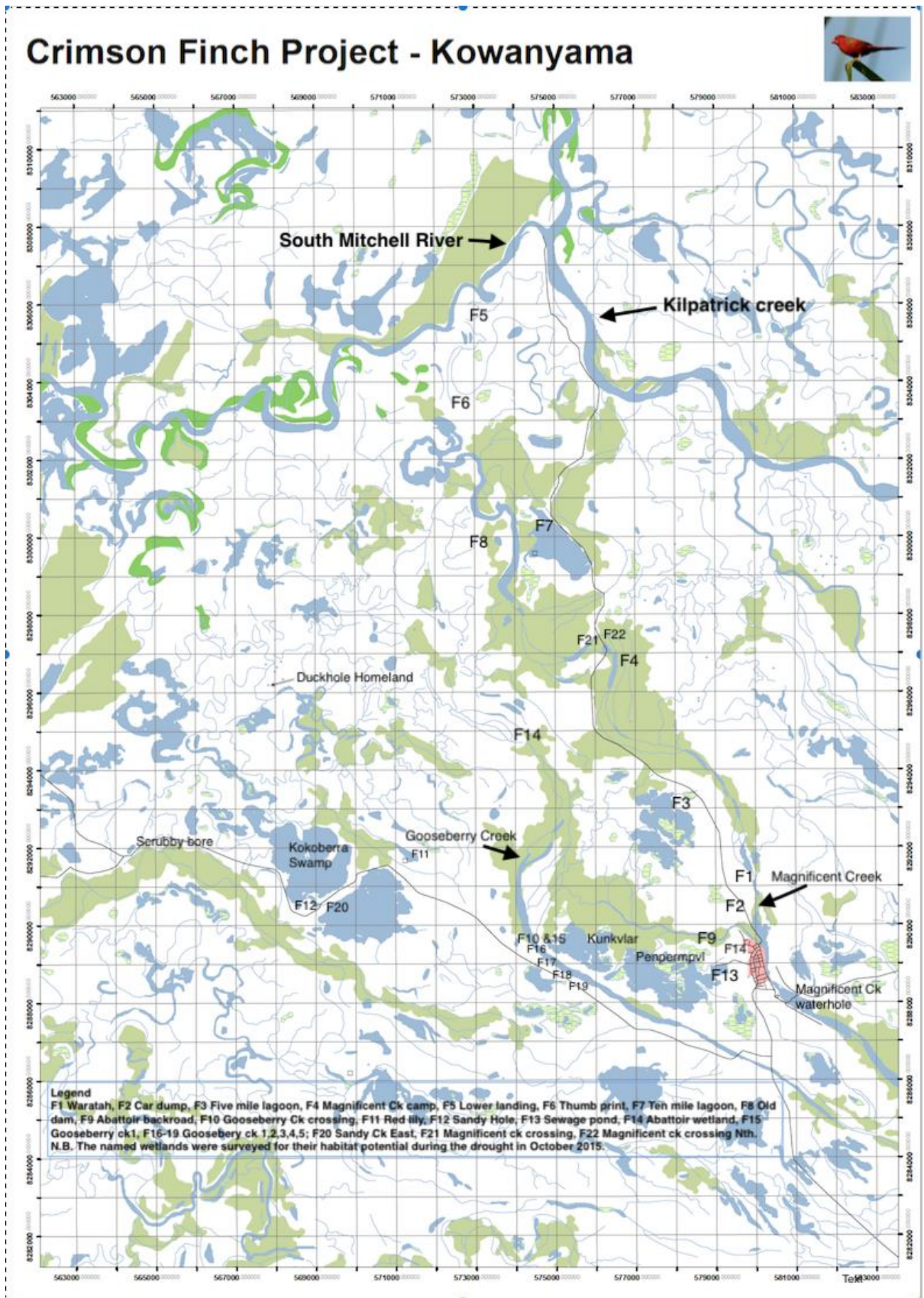
ACKNOWLEDGEMENTS

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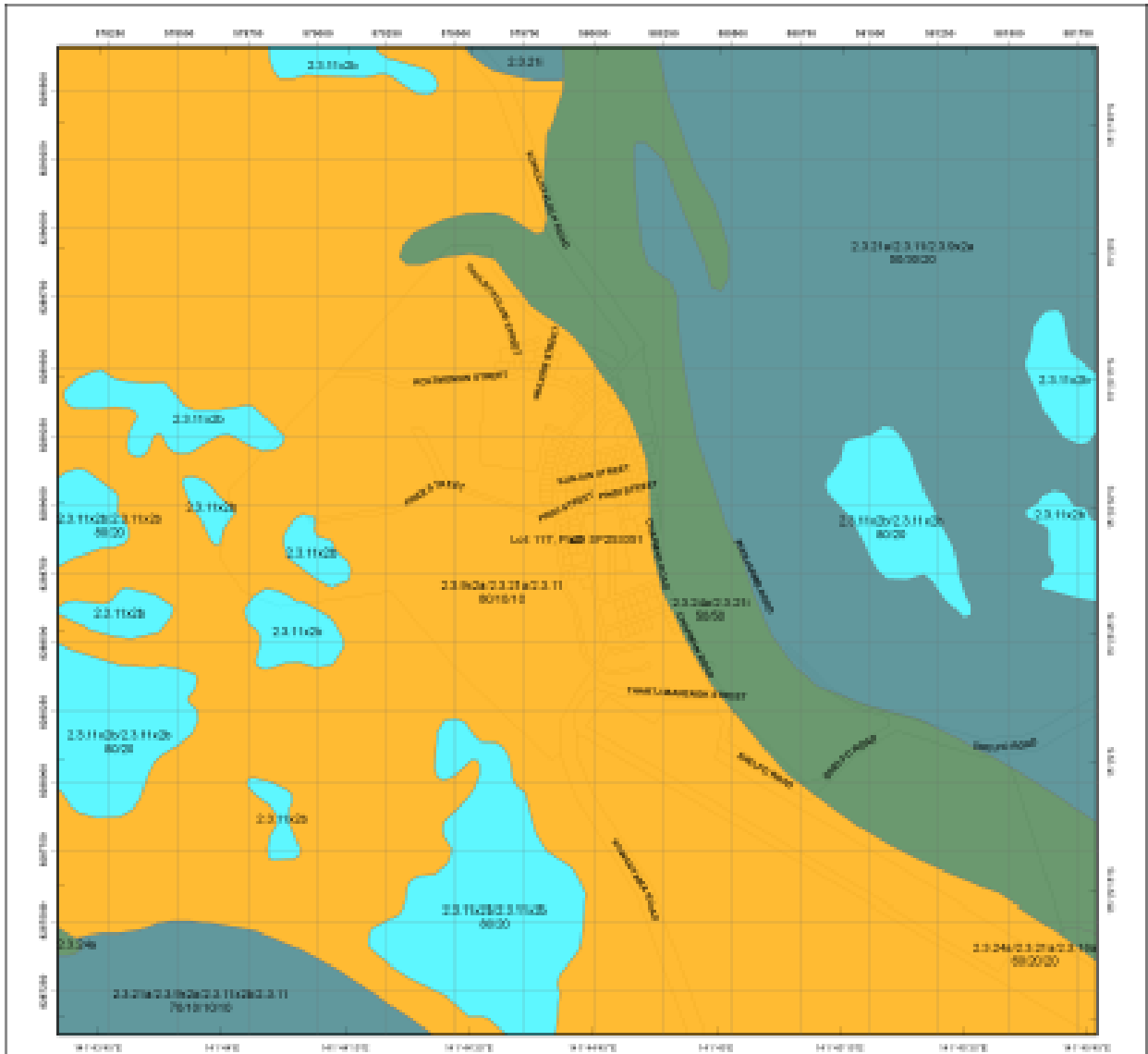
Appendix A – Survey Map



Appendix B - Some other Kowanyama finches – black-throated finch (top left), red-browed finch (top right), masked finch (bottom left), chestnut-breasted manikin (bottom right), double-barred finch (bottom)



Appendix C - Broad Vegetation Groups



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups BVG1M Description (BVG1M codes)

- Un-used BVG1M
- DRAFT data applicable
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8c)
- 3. Eucalypt woodlands in open forests (mainly eastern Qld) (9-11a)
- 4. Eucalypt open forests to woodlands on floodplains (10-10d)
- 5. Eucalypt (dry) woodlands on inland depositional plains (11-11a)
- 6. Eucalypt low open woodlands usually with sparse understorey (11-11d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22a)
- 9. Acacia savanna (munga) dominated open forests, woodlands and shrublands (20-22b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-24a)
- 11. Mixed species woodlands, open woodland - inland (boregong) includes wooded downs (27-27f)
- 12. Other coastal communities or heath (28-28f)
- 13. Tussock grasslands, herblands (30-32a)
- 14. Ruzicki grasslands (33-33a)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Water
- Coastal boundaries



This product is projected into GDA 1994 MGA Zone 54

Broad vegetation groups prior to clearing are applied by look up table to the regional ecosystems vegetation communities. Each polygon is colored by the distinct BVG1M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled. Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:500,000. At this scale, the minimum nominal polygon size is 5 hectares or minimum rounded width of 70 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres. Regional ecosystems are defined as vegetation communities in a biotope that are consistently associated with a particular combination of geology, soil, and land use. The label consists of 3 components: biogeographic, land zone, and vegetation community - the dominant canopy species, e.g. 11.3.3. Descriptions of RVs are found under the search term "Regional Ecosystems Queensland". Regional ecosystem mapping at 1:500,000 map scale is derived from the following sources: 1:500,000 BGV (BVG) aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.