

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister approved this conservation advice and transferred this sub-species from the Vulnerable to Endangered category, effective from 15/02/2018

Conservation Advice

Neochmia phaeton evangelinae

crimson finch (white-bellied)

Taxonomy

Conventionally accepted as *Neochmia phaeton evangelinae* (d'Albertis & Salvadori 1879).

The taxonomic position of the crimson finch (white-bellied) has not been resolved. It is currently recognised as a subspecies of *Neochmia phaeton* (crimson finch) in the Australian Faunal Directory. The IUCN Red List considers the crimson finch (white-bellied) to be a full species (*Neochmia evangelinae*) based on del Hoyo & Collar (2017).

Summary of assessment

Conservation status

Endangered: Criterion 2

The highest category for which *Neochmia phaeton evangelinae* is eligible to be listed is Endangered.

Neochmia phaeton evangelinae has been found to be eligible for listing under the following category:

Criterion 2: Endangered

The crimson finch (white-bellied) is listed as Vulnerable under Queensland legislation (*Nature Conservation Act 1992*). For information on the listing status of this species under relevant state legislation, see <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

Reason for conservation assessment by the Threatened Species Scientific Committee

The crimson finch (white-bellied) was listed as Vulnerable under the predecessor to the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), the *Endangered Species Protection Act 1992* and transferred to the EPBC Act in July 2000.

This advice follows assessment of new information provided to the Threatened Species Scientific Committee (the Committee) to re-assess the listing status of the crimson finch (white-bellied).

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 30 business days between 4 April and 19 May 2017. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

Sub-species information

Description

The crimson finch (white-bellied) measures about 13 cm long, has a wing-span of 16-17 cm, and a mass of about 10 g. The plumage of adults differs between the sexes. Adult males have a bright red face, bill, throat and breast, and have bright red flanks with white spotting.

They have greyish-brown colouring on the crown and back of the head, the rear and sides of the neck, back and shoulders, and the upper surfaces of the wings. The back, shoulders and upper surfaces of the wings are suffused with red. They have white colouring on the under surfaces of the wings, a white to cream belly, thighs and under-tail coverts. The tail is mainly red above, with darker centres to the feathers, and brown below, with red trim. The irises vary from red to brownish, and they have brownish legs and feet (Higgins et al. 2006).

Adult females are similar in appearance to adult males, but differ by having a brownish-grey breast, brown flanks with white spotting, and brown thighs and uppertail coverts. They have paler, greyish-brown colouring on the crown and back of the head, the rear and sides of the neck, back and shoulders, and the upper surfaces of the wings. The red suffusion on the back, shoulders and upper surfaces of the wings is paler than in adult males (Higgins et al. 2006).

Juvenile birds can be distinguished from the adults. The most obvious differences are the predominantly brown plumage (including brown plumage on the face), the duller and less extensive suffusion of red, the dark brown or greyish-black bill, and the absence of the white spots on the flanks (Higgins et al. 2006).

Distribution

The crimson finch (white-bellied) occurs on Cape York Peninsula in Queensland, and in the Fly region of southern Papua New Guinea (Coates 1990; Schodde & Mason 1999). In Australia, the crimson finch (white-bellied) is found only in four separate subpopulations on the Cape York Peninsula in northern Queensland (Schodde & Mason 1999). Three subpopulations are located on the west coast (at the mouth of the Archer River near Aurukun, between the mouths of the Edward and Munkun Rivers near Pormpuraaw, and along Magnificent Creek near Kowanyama) and one subpopulation is located on the east coast (along the Normanby, Kennedy and Laura Rivers in Lakefield National Park) (Dorracott & Garnett 2007; Garnett et al. 2011). A fifth subpopulation previously occurred further north on the Cape York Peninsula at Iron Range, but this population is now thought to no longer exist (M Todd pers. comm. 2017).

Populations in Australia and Papua New Guinea are geographically separated by the Torres Strait. Given the sedentary nature of the species, this indicates that the crimson finch (white-bellied) population in Australia is genetically isolated from the population in Papua New Guinea (Garnett & Crowley 2000).

Relevant biology/ecology

The crimson finch (white-bellied) occurs in grasses and other vegetation near bodies of fresh water, such as rivers and swamps, particularly in association with *Pandanus* or dune swales (Dorracott & Garnett 2007). The subspecies has also been recorded around human settlement at Pormpuraaw (Garnett & Bredl 1985). Two key habitat types, *Pandanus* and canegrass, have been identified as being important to the conservation of the subspecies (Todd, unpub. cited in Dorracott & Garnett 2007).

Pandanus type habitat is usually located within 10 km of the coast, and consists of swampy grasslands with scattered *Pandanus spiralis*, or dune woodlands with a dense grassy understorey, a midstorey dominated by *P. spiralis*, and a canopy comprised of varying species of trees. Crimson finch (white-bellied) subpopulations near Aurukun and Pormpuraaw occur in this type of habitat (Dorracott & Garnett 2007).

Canegrass type habitat consists of open forest with a dense grassy understorey, and is usually located along watercourses. The crimson finch (white-bellied) uses this habitat type near Kowanyama and in the Lakefield region. The canopy is usually dominated by *Corymbia tessellaris* (carbeen) on the east coast of the Cape York Peninsula, and by *C. tessellaris* var. *dallachiana* on the west coast. The midstorey includes deciduous shrubs and palms such as *Corypha elata* and *Livistona* species. In the Lakefield region, the understorey is mostly composed of *Chionachne cyathopoda* (river grass) (Dorracott & Garnett 2007). On the Normanby River, the understorey is mostly *Coix gasteenii* (S Legge pers. comm. 2017).

The preferred habitat of the crimson finch (white-bellied) is in vegetation that is prone to regular burning by wildfire and/or deliberate burning. The subspecies is able to persist in burnt areas by occupying unburnt shrubs and other habitat remnants nearby. For example, near Pormpuraaw, the subspecies moved from its burnt preferred habitat in vegetation surrounding a lagoon in a crocodile farm, into unburnt vine forest on nearby sand dunes (Garnett & Crowley 2000).

The crimson finch (white-bellied) is sedentary, but will make small seasonal movements to exploit resources within its home range (Forshaw et al. 2012). Availability of shelter is critical to the survival of the subspecies. Due to its wedge-shaped tail and rounded wings, the crimson finch (white-bellied) is unable to fly long distances and has poor dispersal ability (Franklin et al. 2017). The subspecies mostly occurs in small flocks (< 15 birds) (Higgins et al. 2006).

The crimson finch (white-bellied) feeds primarily on immature and ripe seeds of grasses and herbaceous plants (Todd et al. 2003). The subspecies also consumes small invertebrates such as spiders, mainly during the breeding season (Dorricott & Garnett 2007).

Breeding can occur throughout the year, but mostly coincides with the wet season during January and May (Dorricott & Garnett 2007; Todd 2002; Milenkaya et al. 2011). The subspecies builds a domed grass nest in *Pandanus* or *Corypha* palms (Todd 2002) a few metres off the ground (Schultz & Pierce 2016) and lays up to six eggs (Immelmann 1982). A generation time of 3.5 years (Garnett et al. 2011) is derived from an average age at first breeding of one year and an annual adult survival rate of 50 percent, both extrapolated from mean values for Estrildidae. A maximum longevity in the wild of 6.9 years is extrapolated from *Poephila personata* (masked finch) (Australian Bird and Bat Banding Scheme, unpublished data).

Threats

The primary threats to the crimson finch (white-bellied) are altered fire regimes, habitat modification by weeds, and habitat degradation by feral pigs (*Sus scrofa*) and grazing cattle (*Bos taurus*) (Dorricott & Garnett 2007). The subspecies is potentially threatened by illegal trapping for the aviculture industry (Dorricott & Garnett 2007). Proposed mining and associated habitat clearing is an emerging threat to the crimson finch (white-bellied) (M Todd pers. comm. 2017).

Table 1 – Threats impacting the crimson finch (white-bellied) in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Fire		
Altered timing and increased frequency of high intensity fire events	known present	<p>Altered timing of fires, and increased frequency of high intensity fire events, is threatening the crimson finch (white-bellied) through habitat modification and disturbance. Fire events that occur late in the dry season, particularly in canegrass type habitat, pose a threat to the crimson finch (white-bellied) as the vegetative cover required by the subspecies is destroyed (M Todd pers. comm. 1999, as cited in Dorricott & Garnett 2007).</p> <p>On the other hand, burning solely in the very early dry season, with low intensity fires, in conjunction with grazing (which reduces fuel loads and therefore fire intensity), has resulted in grasslands at the northern end of Lakefield National Park being modified through invasion of <i>Melaleuca viridiflora</i> (broad-leaved tea-tree) (Dorricott & Garnett 2007).</p> <p>Excessive intense fire in riparian areas has resulted in the reduction of nest site availability for the crimson finch (white-bellied) (Schutz & Pierce 2016).</p>

		For example, current fire management at Kowanyama has resulted in intense fires destroying riparian habitat, including <i>Pandanus</i> and <i>Coryphan</i> palms which provide preferred breeding habitat for the crimson finch (white-bellied) (R Pierce pers. comm. 2017). Surveys in 2016 found a low proportion of juveniles, suggesting poor breeding (M Todd pers. comm. 2017). Declines of the subspecies at sites near Kowanyama may be related to localised intense fires and associated loss of breeding and foraging habitat (R Pierce pers. comm. 2017).
Invasive species		
Habitat modification by weeds	known present	<p>The crimson finch (white-bellied) is threatened by the invasion of preferred riparian habitat by rubber vine (<i>Cryptostegia grandiflora</i>) (Dorricott & Garnett 2007) and grader grass (<i>Themeda quadrivalvis</i>) (R Pierce pers. comm. 2017).</p> <p>Rubber vine is a Weed of National Significance. It is highly invasive and smothers vegetation used by the crimson finch (white-bellied) (Dorricott & Garnett 2007; DOEE 2017b). Subpopulations at Lakefield National Park and Magnificent Creek, near Kowanyama, are threatened by rubber vine (Dorricott & Garnett 2007). Rubber vine infestations have been associated with the disappearance of the subspecies from previously occupied sites, including Laura River (Garnett et al. 2011).</p> <p>Grader grass competes with other native and introduced grasses and forms widespread monocultures, particularly in areas that have been overgrazed. Grader grass increases fuel loads and alters fire regimes. In particular, grader grass increases the intensity of fire events (DOEE 2017d).</p> <p>Water hyacinth (<i>Eichhornia crassipes</i>) is a highly invasive aquatic plant and is a Weed of National Significance (DOEE 2017c). It has been found in Magnificent Creek, in the Kowanyama area. The water hyacinth has the potential to crowd the water's edge which may impede the ability of the crimson finch (white-bellied) to drink (Schultz & Pierce 2016).</p>
Habitat degradation by pigs (<i>Sus scrofa</i>)	known present	Feral pigs are abundant within the distribution of the crimson finch (white-bellied), and pose a substantial threat at sites near Kowanyama (C Hannock pers. comm. 2017). Trampling and uprooting of riparian vegetation by feral pigs is causing degradation of habitat for crimson finch (white-bellied) (Schutz & Pierce 2016).
Domestic species		
Habitat degradation from grazing cattle (<i>Bos taurus</i>)	known present	Heavy, continuous cattle grazing along riparian strips can lead to habitat degradation and modification (through increased weed abundance), loss of cover, seed suppression of grassland species and reduced food availability for the crimson finch (white-bellied) (Houston & Black 2016). Overgrazing has been associated with the extirpation of the crimson finch (white-bellied) from sites near Aurukun where tall grasses have been lost (Garnett & Crowley 2000).

Habitat loss, disturbance and modifications		
Habitat loss and disturbance from mining	potential future	Development of proposed mines in the future may cause habitat loss and disturbance to important crimson finch (white-throated) subpopulations (M Todd pers. comm. 2017).
Illegal trapping		
Trapping for aviculture	potential	The crimson finch (white-bellied) has historically been of high value in the aviculture industry. The subspecies has been illegally trapped in the past and some illegal trapping may continue (Dorricott & Garnett 2007). The impact of illegal trapping on the crimson finch (white-bellied) has not been determined.

How judged by the Committee in relation to the EPBC Act criteria and regulations

Criterion 1. Population size reduction (reduction in total numbers)			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p>		<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>	

Evidence:

Insufficient data to determine eligibility.

There are no recent survey data which could be used to discern a trend in the crimson finch (white bellied) population. The current population is thought to be approximately 2000 mature individuals (Garnett and Crowley 2000, Garnett et al. 2011), but this estimate comes from surveys done between 1998 and 2003. Considering ongoing habitat degradation through inappropriate fire regimes, overgrazing by cattle, feral pig habitat damage and weed infestation, the crimson finch (white bellied) population may have declined since the surveys were undertaken, but there is no current information that could be used to estimate the extent of any such decline (M Todd pers. comm. 2017).

The Committee considers there are insufficient data to demonstrate if the crimson finch (white-bellied) is eligible for listing under Criterion 1.

Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Eligible under Criterion 2 (B2a, b) for listing as Endangered.

The extent of occurrence (EOO) is estimated at approximately 55 000 km² and area of occupancy (AOO) is estimated as 156 km². These figures are based on the mapping of point records from 1997 to 2017, obtained from state governments, museums, CSIRO and Birdlife Australia. The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2014 (DOEE 2017a).

The crimson finch (white-bellied) subpopulations are separated by large distances and it is considered that a single event (such as wildfire) is not likely to impact more than one subpopulation. As such, the subspecies is considered to occur at four locations (near Aurukun, near Pormpuraaw, near Kowanyama and Lakefield National Park).

The key threats to the crimson finch (white bellied), including inappropriate fire regimes, overgrazing by cattle, feral pig habitat damage and weed infestation are all still present, and are likely to continue to negatively impact preferred habitat of the subspecies into the future.

The Committee considers that the crimson finch (white bellied) is eligible for listing as Endangered under Criterion 2 (B2a, b) as the area of occupancy is restricted, the subspecies occurs at less than five locations, and habitat quality is continuing to decline.

Criterion 3. Population size and decline			
	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2 An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

Evidence:

Insufficient data to determine eligibility.

The population of crimson finch (white-bellied) is estimated to be approximately 2000 mature individuals (Garnett & Crowley 2000, Garnett et al. 2010).

Threats to the crimson finch (white-bellied) remain, and are likely to continue into the future. However, it is unclear to what extent these threats are impacting on the abundance of crimson finches (white-bellied) across their range. Although a decline in crimson finch (white-bellied) numbers could be inferred from the ongoing declines in habitat quality, the rate of this decline has not been empirically documented.

The Committee considers there are insufficient data to demonstrate if the crimson finch (white-bellied) is eligible for listing under Criterion 3.

Criterion 4. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	< 50	< 250	< 1,000

Evidence:

Not eligible for listing under Criterion 4.

The crimson finch (white-bellied) population is estimated at approximately 2000 mature individuals (Garnett & Crowley 2000, Garnett et al. 2011). Garnett et al (2011) states that the population fluctuates depending on the season and suggests the population may approach 1000 at its lowest point in the year.

The Committee considers that the crimson finch (white-bellied) does not meet the requirements of Criterion 4 as the population is thought to remain above 1000 individuals at its lowest point.

Criterion 5. Quantitative Analysis			
	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Evidence:

Insufficient data to determine eligibility.

As a population viability analysis has not been undertaken, there are insufficient data to demonstrate if the crimson finch (white-bellied) is eligible for listing under Criterion 5.

Conservation actions

Recovery plan

The crimson finch (white-bellied) is currently included in the '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*' (Dorricott & Garnett 2007). This recovery plan should be retained until it sunsets on 1 April 2022.

A decision about whether there should be a recovery plan for the crimson finch (white-bellied) after the current plan has expired has not yet been determined, and should only be made once the current plan has been reviewed.

Primary conservation actions

The primary conservation action for the crimson finch (white-bellied) is to maintain high value breeding and foraging habitat by undertaking active fire management and control of invasive species.

Conservation and management priorities

Fire

- Protect crimson finch (white-bellied) nesting habitat from high intensity fire events.
- Implement a fire management program in grasslands used for foraging by the crimson finch (white-bellied) that aims to restore grassland structure and prevent the expansion of tea-tree thickets. Fire management must not encourage the spread of grassy weeds, such as grader grass, and must not detrimentally affect adjacent habitats that are fire sensitive (e.g. saltbush areas).

Invasive species

- Undertake a control program for weeds, including rubber vine, water hyacinth and grader grass, where they are observed to threaten, or pose a threat to, the crimson finch (white-bellied), using appropriate methods.
- Implement feral pig control measures in crimson finch (white-bellied) habitat, including exclusion fencing around key subpopulations.

Domestic species

- Limit cattle grazing in riparian zones within crimson finch (white-bellied) habitat. Livestock should be excluded from known crimson finch (white-bellied) habitat during the early wet season when food resources are limited for the subspecies. Fences should be erected around key riparian habitat and maintained.
- Ensure land managers are aware of the occurrence of the crimson finch (white-bellied) and provide protection measures against key and potential threats, such as overgrazing, in known crimson finch (white-bellied) habitat.

Habitat loss, disturbance and modifications

- Prevent habitat clearance and disturbance. Ensure future developments do not impact on crimson finch (white-bellied) subpopulations.

Stakeholder Engagement

- Liaise with organisations which are undertaking research and conservation actions for the crimson finch (white-bellied) including CSIRO and the Queensland Department of Environment and Heritage through the Indigenous Land and Sea Ranger Program (including Kowanyama Aboriginal Shire Council, Pormpuraaw Aboriginal Shire Council and Aak Puul Ngantam (Aurukun)).
- Engage with local communities to promote conservation of the crimson finch (white-bellied) and the subspecies' habitat across land tenures.

Survey and monitoring priorities

- Undertake monitoring at all known subpopulations in Cape York Peninsula to more precisely assess the Australian crimson finch (white-bellied) population size, population trend and distribution.
- Monitor the response of the subspecies to fire, using an appropriate measure (e.g. occupancy, abundance, mortality, ranging behaviour and breeding success) based on knowledge of the ecology of the subspecies, and with a monitoring design that aims to improve understanding of the subspecies' response to fire. Precise fire history records must be kept and maintained.
- Monitor the spread of weeds, particularly rubber vine, water hyacinth and grader grass, within crimson finch (white-bellied) habitat to inform ongoing management actions. Undertake regular site mapping to identify high risk weed infestations within crimson finch (white-bellied) habitat to assist planning.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them in necessary.

Information and research priorities

- Investigate the importance of Pormpuraaw lagoon for the crimson finch (white-bellied), which contains areas of long-unburnt habitat and develop a management strategy if required.
- Assess the potential for reintroduction of crimson finch (white-bellied) to areas where the subspecies formerly occurred, including at Lockhart River (Iron Range), or at sites where suitable habitat is available.
- Undertake a genetic comparison of the Australian and Papua New Guinea subpopulations to clarify the taxonomic position of the crimson finch (white-bellied) in the Cape York Peninsula.

Recommendations

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **transferring** from the Vulnerable category to the Endangered category:
Nechmia phaeton evangelinae
- (ii) The Committee recommends that the recovery plan decision be maintained.

Threatened Species Scientific Committee

13/09/2017

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