The Minister approved this conservation advice on 27/10/2015 and agreed that this species should retain its current listing status of vulnerable under the EPBC Act

Conservation Advice

Erythrotriorchis radiatus

red goshawk

Taxonomy

The species is conventionally accepted as *Erythrotriorchis radiatus* (Latham, 1802).

Summary of assessment

Conservation status

Vulnerable

The red goshawk was transferred from the *Endangered Species Protection Act 1992* (ESP Act) to the Vulnerable list of the *Environmental Protection and Biodiversity Conservation Act* (1999) (EPBC Act) when the latter came into force in July 2000. For a species to be considered as Vulnerable under the Endangered Species Protection Act 1992, the Minister must have been satisfied that the species was likely to become endangered within the next 25 years.

Following a formal review of the listing status of the red goshawk, the Threatened Species Scientific Committee (the Committee) has determined that there is no evidence that the species has undergone any demonstrable recovery since being listed; and that there is insufficient evidence to support a change of status of the species under the EPBC Act. Therefore, the Committee concluded that the red goshawk should remain listed as Vulnerable under the EPBC Act.

Species can be listed as threatened under state and territory legislation. For information on the listing status of this species under relevant state or territory legislation, see http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Reason for conservation assessment by the Threatened Species Scientific Committee

This advice follows assessment of new information provided to the Committee to reassess the listing status of *Erythrotriorchis radiatus,* for potential de-listing.

Relevant part of the EPBC Act for amending the list of threatened native species

Section 186 of the EPBC Act states that:

"(2A) The Minister must not delete (whether as a result of a transfer or otherwise) a native species from a particular category unless satisfied that:

(a) the native species is no longer eligible to be included in that category; or

(b) the inclusion of the native species in that category is not contributing, or will not contribute, to the survival of the native species."

Public Consultation

Notice of the proposed amendment and a consultation document was made available for public comment for greater than 30 business days between 17 November 2014 and 9 January 2015. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

Species Information

Description

The red goshawk is a large, swift and powerful rufous-brown hawk, growing to a length of 45–60 cm, with a wingspan of 100–135 cm. The two sexes are different in size and appearance (Baker-Gabb, 1984 in NSW NPWS, 2002). The females weigh approximately 1.1 kg and the males approximately 0.6 kg. Males are boldly mottled and streaked, with rufous scalloping on the back and upperwings, rufous underparts, bold bars on the underwings, and with large yellowish legs and feet. Females are more powerfully built, paler and more heavily streaked below, and showing some white on the underbody. Juveniles have redder upperparts, and the head and underparts are rich rufous with fine dark streaks. The rufous head of the juvenile distinguishes it from adults.

Distribution

The species occurs in a patchy, widespread distribution across coastal and sub-coastal regions of northern and eastern Australia. Historically it occured from the north-east tip of New South Wales (north of 28ºS), across Queensland and the Northern Territory, to the north of Western Australia (north of 19ºS) (Marchant & Higgins, 1993). The species is thought to consist of two subpopulations, one on the Tiwi Islands containing approximately 200 adults, and a mainland population containing approximately 1200 adults (Garnett et al., 2011). However, a lack of sightings in NSW and south-east Queensland in recent years suggests that the mainland population may now be smaller than previously estimated and that the species range may have contracted to the north (Red Goshawk Recovery Team, 2015). Further survey effort is required to determine the species' current distribution and likely population size.

Cultural Significance

The species is of cultural significance to Indigenous peoples on the Tiwi Islands, and the Lama Lama people on Cape York Peninsula. It may also be of cultural significance to other Indigenous groups and Traditional Owners due to its large range (Red Goshawk Recovery Team, 2015).

Relevant Biology/Ecology

The species inhabits coastal and sub-coastal tall open forests and woodlands, tropical savannas traversed by wooded or forested rivers, and the edges of rainforests, usually on fertile soils (Marchant & Higgins, 1993). In partly cleared parts of eastern Queensland it is associated with gorge and escarpment country (Czechura & Hobson, 2000; Czechura et al., 2009).

The red goshawk rarely breeds in areas with fragmented native vegetation (Aumann & Baker-Gabb, 1991; Czechura, 2001). The stick nests, in which 1–2 eggs are laid, are restricted to trees that are taller than 20 m and within 1 km of a watercourse or wetland (Aumann & Baker-Gabb, 1991). The species hunts within a home range of up to 200 km^2 in open forests and gallery forests, taking mostly medium to large birds (Czechura & Hobson, 2000).

Red Goshawks are usually observed singly, but occasionally in pairs or family groups. Pairs are believed to remain within the nesting territory all year, but may expand their home range when not breeding (Aumann & Baker-Gabb, 1991; Debus & Czechura, 1988). In winter in eastern Australia, the species moves from nest sites in the mountain ranges to coastal plains, where it is associated with permanent wetlands and where it often feeds on waterbirds (Garnett et al., 2011). Occasional records of individuals hundreds of kilometres from the known breeding range suggest juvenile dispersal from their natal territories may be extensive (Debus & Czechura, 1988). The generation time is estimated at 8.3 years (Garnett et al., 2011).

Threats

Vegetation clearance is thought to have caused the historical decline in New South Wales and southern Queensland (Czechura & Hobson, 2000; Czechura et al., 2011). Ongoing declines may also be attributed to habitat fragmentation and degradation as red goshawks in Queensland are most scarce where lowland forests have been cleared for agriculture or for urban development (Czechura et al., 2011).

Declines have also occurred due to forestry operations, particularly on Melville Island, Northern Territory (Woinarski et al., 2003; Woinarski et al., 2007). Nests are particularly vulnerable as they are usually found in the tallest trees, which are typically the most valuable for timber.

Reduced fire frequencies leading to vegetation thickening and a reduction in habitat suitability may also be a threat (Red Goshawk Recovery Team, 2015). An open understorey below a canopy of large, widely-spaced trees provides ideal hunting habitat for red goshawks (DERM, 2012).

Declines in abundance of the key prey species caused by the loss or degradation of freshwater wetlands, loss of hollow-bearing trees in which prey breed, over-grazing by livestock and feral herbivores, and altered fire regimes (including both increased and decreased fire frequencies) may also be impacting on the species' long term viability (Czechura & Hobson, 2000; Franklin et al., 2005; Czechura et al., 2011).

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%**

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Not eligible

Records indicate that the status of the population, extent of occurrence, and area of occupancy are continuing to decline for the red goshawk (Red Goshawk Recovery Team, 2015). The absence of confirmed sightings or breeding records from NSW in recent years, and a lack of sightings during a 2014 survey in south-east Queensland, suggests a recent contraction of the species' range northwards (Seaton, 2014). The red goshawk is now likely to be functionally extinct in NSW and south-east Queensland, representing a 20% decline in the Queensland population (equivalent to a 5% decline in the mainland subpopulation) over the past decade (DERM, 2012; Red Goshawk Recovery Team, 2015). It is unknown whether similar declines have occurred elsewhere, due to inadequate survey effort across the remainder of the species' range.

An expert committee, convened by BirdLife Australia in 2010 to review the conservation status of all Australian birds, considered that the population may be gradually declining in eastern Queensland due to habitat loss, and that the total population may be declining (but with a low level of confidence). Although these inferences were not based on survey data, they concluded that past, current or future population declines were unlikely to exceed 30% in any three generation period (Garnett et al., 2011).

Following assessment of the data the Committee has determined that the species is not eligible for listing in any category under this criterion. Notwithstanding the uncertainty regarding population trends, past, current or future population declines are thought unlikely to exceed 30% in any 3-generation period.

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 km²**	**< 5,000 km²**	**< 20,000 km²**
B2. Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
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:

Not eligible

Garnett et al. (2011) estimated the extent of occurrence to be 2 900 000 km^2 and the area of occupancy to be the same. However, these could be substantial overestimates as they are heavily influenced by a vagrant record from central Australia and include areas in northern NSW and south-east Queensland in which the red goshawk may now no longer occur (Red Goshawk Recovery Team, 2015). Even excluding these areas from calculations, the estimated extent of occurrence still exceeds the thresholds under Criterion B1 and B2.

Following assessment of the information the Committee has determined that the geographic distribution is not limited. Therefore, the species has not been demonstrated to have met this required element of this criterion.

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**
	(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

An expert committee, convened by BirdLife Australia in 2010 to review the conservation status of all Australian birds, estimated the total number of mature individuals at 1400 across two subpopulations (200 in the Tiwi Islands and 1200 in the mainland population). Garnett et al. (2011) also suggested the population was still declining (but with a low level of confidence).

Recent surveys in southern Queensland and northern New South Wales suggest that red goshawks are now extremely rare or absent from those regions, which may represent an ongoing range contraction to the north and the loss of possibly 20% of the breeding population from Queensland (equivalent to approximately 5% of the total mainland subpopulation (Seaton, 2014; NSW Scientific Committee, 2008; Red Goshawk Recovery Team, 2015; DERM, 2012)). It is currently not possible to establish whether similar declines have occurred elsewhere, as survey effort has been inadequate (Red Goshawk Recovery Team, 2015). The lack of sightings in NSW and south-east Queensland in recent years suggests that the mainland population may now be smaller than previously estimated (Red Goshawk Recovery Team, 2015).

Following assessment of the available information the Committee has determined that there is insufficient evidence to demonstrate that the subspecies is no longer eligible for listing as Vulnerable under this criterion. The total population is likely less than 1400 adults (low), it is probably still declining, and the size of the largest subpopulation is close to 1000 individuals and plausibly less; therefore it is possible the species meets Criterion C2(a)(ii).

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

The most recent estimate of the total number of mature individuals is approximately 1400 adults (Garnett et al. 2011) which is not considered extremely low, very low or low. Although this estimate is has low reliability, and does not consider recent identified range contractions (Red Goshawk Recovery Team, 2015), it is unlikely that the total population size is less than 1000 individuals. Therefore, the Committee considers that the species has not been demonstrated to have met this required element of this criterion.

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

Population viability analysis has not been undertaken.

Consideration for delisting

This assessment indicates that there is insufficient evidence to demonstrate that the red goshawk is no longer eligible to be listed as Vulnerable under the EPBC Act, considering the ongoing declines in NSW and southern Queensland and the uncertainty in the population estimates of the mainland subpopulation.

The inclusion of the red goshawk in the Vulnerable category is contributing to the survival of the subspecies, as the EPBC Act requires project proponents to refer a proposal for assessment if it may have a significant impact on a threatened species. Where necessary, the Department has issued conditions requiring proponents to avoid, minimise or mitigate impacts on the species.

Conservation Actions

Recovery Plan

A national recovery plan for *Erythrotriorchis radiatus* (red goshawk) is currently in place (DERM, 2012). The implementation of recovery actions outlined in the plan is being coordinated by the Red Goshawk Recovery Team.

Conservation and Management Actions

Primary Conservation Action

- Encourage landholders to protect and manage red goshawk territories.

- Promote information used to identify and protect nesting habitat.
- Limit access to known nest sites.
- Protect habitat through purchase or voluntary conservation agreements.
- Produce habitat descriptions and maps for management purposes.
- Produce educational materials that promote the recovery process.
- Consult with Indigenous groups, including Indigenous rangers on Tiwi Island, on appropriate management actions.

Survey and Monitoring Priorities

- Identify important populations and nest localities for monitoring.
- Monitor red goshawk habitat to determine territory occupancy and productivity.
- Undertake population surveys in areas where data is scarce, e.g. the Gulf Plains region.

Information and Research Priorities

- Determine the population size and structure, including the number of subpopulations.
- Identify population dynamics, especially adult survivorship.
- Determine the impact of habitat fragmentation on prey density and population persistence.
- Map essential habitat across the whole range of the species.
- Determine the habitat-use and home-range patterns of red goshawks on the mainland.
- Establish the national distribution, extent of occurrence, and area of occupancy using all available data.

Recommendations

(i) The Committee recommends that *Erythrotriorchis radiatus* should retain its current listing status of Vulnerable under the EPBC Act as there is insufficient evidence to support transferring it to a different category.

(ii) The Committee recommends that the current recovery plan should be retained and updated as required.

Threatened Species Scientific Committee

02/09/2015

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