

Australian Capital Territory

Nature Conservation (Riek's Crayfish) Conservation Advice 2024

Notifiable instrument NI2024-256

made under the

Nature Conservation Act 2014, s 90C (Conservation advice)

1 Name of instrument

This instrument is the *Nature Conservation (Riek's Crayfish) Conservation Advice 2024*.

2 Commencement

This instrument commences on the day after its notification day.

3 Conservation advice for Riek's Crayfish

Schedule 1 sets out the conservation advice for Riek's Crayfish (*Euastacus rieki*).

Arthur Georges
Chair, Scientific Committee
21 May 2024

Schedule 1

(see s 3)



ACT
Government

Environment, Planning and
Sustainable Development



ACT Scientific
Committee

CONSERVATION ADVICE

RIEK'S CRAYFISH – *Euastacus rieki*

CONSERVATION STATUS

The Riek's Crayfish – *Euastacus rieki* Morgan, 1997 – is recognised as threatened in the following jurisdictions:

National **Endangered**, *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
ACT **Endangered**, *Nature Conservation Act 2014*

ELIGIBILITY

The Riek's Crayfish is listed as Endangered in the ACT Threatened Native Species List under IUCN Criterion B: B2ab(iii,v) at the national level (Attachment A). The main contributing factors are a restricted distribution (area of occupancy (AOO) of 180 km²) and number of locations (not greater than five (5)) with continuing decline inferred in area, extent and/or quality of habitat, and number of mature individuals due to climate change (increasing temperature and increasing bushfire frequency) and other threats including predation by foxes (particularly after fire) and habitat degradation by horses (DCCEEW 2023).

DESCRIPTION AND ECOLOGY

Riek's Crayfish is a small and spiny crayfish (Coughran 2008), recorded as reaching 53 mm occipital carapace length (OCL ('head length')) (Morgan 1997). The body is usually chocolate brownish to olive green dorsally, grading to a paler brown or orangish on the sides and paler brown and cream ventrally. Joints are orange-red with claws green-blue-brown and pale spines on the claws and body (Morgan 1997; McCormack 2012). Internal features are generally required to distinguish this species.

Knowledge on the biology and ecology of Riek's Crayfish is limited; however, it is recognised that *Euastacus* species have a suite of common biological characteristics as summarised in Furse and Coughran (2011a), which also apply to Riek's Crayfish. Various studies have established that *Euastacus* are very slow-growing (growth increments of a few millimetres OCL per year) and very long-lived, (Honan and Mitchell 1995a, 1995b; Turvey and Merrick 1997; Morey 1998; Furse and Wild 2004; Coughran 2013).



Riek's Crayfish (Mark Jekabsons – EPSDD)

There are no published studies or information on reproduction in Riek's Crayfish.

The first record of berried females occurred in the ACT and was reported in April 2014 with two female specimens of 42 mm and 53 mm OCL, carrying an estimated 70 and 100, 3.5 mm diameter orange eggs, respectively (ACT Government 2021). Both females were collected in a subalpine bog at around 1,600 m above sea level (asl) in Namadgi National Park. A further berried female of 43 mm OCL was recorded in a small stream in Kosciuszko National Park (at 1,254 m asl) in early November 2020, with an estimated 70 orange eggs in late developmental stage with developing embryos visible (Lintermans 2021). The records of berried females from April to November appear to confirm a prolonged breeding season with mating occurring in autumn and eggs held over the winter-spring months when the species' habitat is largely snow-covered (DCCEEW 2023).

During the post 2019–20 bushfire surveys, an examination of around 30 specimens indicated that females are immature below 40 mm OCL but very few crayfish greater than 40 mm OCL were captured (Lintermans 2021). The growth rate, population size and generation length of Riek's Crayfish are not known.

The diet of the Riek's Crayfish is not well understood, but the species may be omnivorous. Little is also known about this species' general biological characteristics, although given its alpine distribution and its close association with cool conditions and specific vegetation types it is anticipated to be intolerant of high temperatures (Bone et al. 2014).

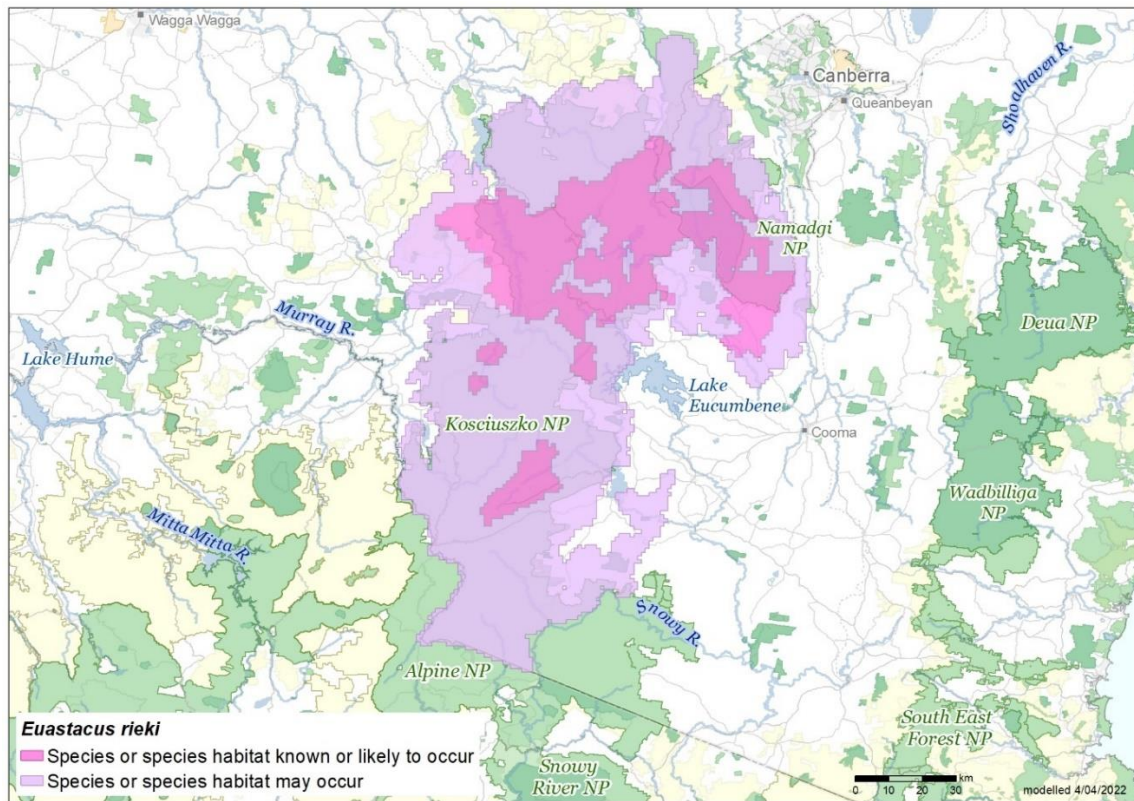
DISTRIBUTION AND HABITAT

Riek's Crayfish is endemic to the high country of the Australian Capital Territory (ACT) and southern New South Wales (NSW) (Morgan 1997; Coughran and Furse 2010). It was also formerly considered to occur in north-eastern Victoria, but Austin et al. (2022) identified a number of specimens from that region as belonging to a different lineage. It has been recorded as low as 560 m asl but is more commonly found above 1,000 m asl, with records up to 1,600 m asl and may occur at higher altitudes (Morgan 1997; Furse and Coughran 2011b; McCormack 2012; ACT Government 2021; Lintermans 2021).

Part of the range of this species occurs in protected areas (Namadgi National Park (ACT); Kosciuszko National Park and Bimberi Nature Reserve (NSW)), but these areas have not been actively managed for the conservation of Riek's Crayfish.

Riek's Crayfish is restricted to small-to moderate-sized streams and stream margins, often fringed by snow gums, tussock grasses and heath, as well as bog wetlands often containing rushes, sedges and sphagnum (Morgan 1997; Lintermans 2021). The species can be found in aquatic environments in native ecosystems such as open grassy plains and eucalypt forests and woodlands, as well as modified environments such as grazing land and pine plantations (Morgan 1997). Most of its habitat is covered by snow or ice in winter (Morgan 1997). The species may create deep and complex burrows at the edge of creeks that extend down to the water table but can also reportedly extend horizontally below the fringing heath and tussock grass (McCormack 2012) and can also make temporary burrows under rocks.

Figure 1: Modeled distribution of the Riek's Crayfish (Source: DCCEEW 2023)



Source: Base map Geoscience Australia; species distribution data [Species of National Environmental Significance](#) database.

THREATS

Climate change is a key threat to the Riek's Crayfish, with the species restricted to higher, cooler altitudes and dependent upon available surface or ground water. Predicted increases in temperature in the region will impact this species across its range. Increased water temperature may result in sub-lethal impacts such as changed habitat availability, crayfish activity patterns and reproductive capacity, and ultimately survival of Riek's Crayfish (DCCEEW 2023).

The frequency and magnitude of bushfires is predicted to increase under climate change scenarios (Di Virgilio et al. 2019). Fire removes vegetation which provides cover to crayfish when emerging from burrows or traversing, particularly in bogs. Dramatic increases in predated crayfish remains have been observed following fires (Carey et al. 2003) and recent evidence from the 2019–20 fires has documented greater than 90% of predator scats collected around upland bogs in the ACT contained crayfish remains (ACT Government 2021).

Storm events following fire usually result in significant inputs of ash and sediment to streams which severely impact aquatic habitats. Ash and sediment inputs smother stream substrates, alter water chemistry, alters riparian shading and organic inputs. Post-fire rainfall impacts on aquatic habitats from high severity fire can significantly alter crayfish habitat and severely reduce local crayfish subpopulations within a single generation (DCCEEW 2023).

Other potential threats that could impact Riek's Crayfish but are not currently evident in the ACT include *Aphanomyces astaci* (crayfish plague), *Cherax destructor* (common yabby) invasion and horse damage to

high country aquatic environments (Unestam 1975; Lowe et al. 2000; TSSC 2008; Coughran et al. 2009; Coughran and Furse 2010; Tolsma and Shannon 2018; Robertson et al. 2019; Lintermans 2021).

MAJOR CONSERVATION OBJECTIVE

The priority management objective should be to increase in the long term, viable, wild populations of the species as a component of the indigenous biological resources of the ACT and as a contribution to regional and national conservation of the species. This includes the need to maintain natural evolutionary processes and resilience to major impact.

CONSERVATION PRIORITIES

Conservation actions are detailed in the Commonwealth Conservation Advice (DCCEEW 2023).

Conservation and management priorities for the Riek's Crayfish in the ACT should be to:

- protect the species from harvest
- protect sites in the ACT where the species occurs
- identify and include the species and habitat location and requirements specifically in the ACT Ecological Guidelines (ACT Government 2019a) and on-ground management applications
- manage habitat to conserve populations by implementing post fire recovery actions and protecting waterways from tracks and road runoff
- actively control foxes around known habitats, especially immediately following fire
- enhance the long-term viability of populations
- improve understanding of the species' ecology, habitat and functional role in its ecosystem
- identify options for management of threats including drought, fire and pest species
- improve community awareness and support for the species and freshwater fish conservation
- actively seek opportunities to involve members of local indigenous communities in on ground activities.

CONSERVATION ISSUES

It is recommended that quantitative targets and resourcing requirements are clearly identified in any Action Plan or other related projects/programs relevant to this species. Broader conservation issues need to be considered in developing and implementing actions arising from this advice and the listing assessment (DCCEEW 2023).

Critical Habitat

The Riek's Crayfish is restricted to high country streams and bogs and has not been found in the absence of permanent surface water (Lintermans 2021). Despite this, burrows can be found 30 m or more from surface water, particularly in bogs presumably accessing near surface ground water. Beyond this, it is not possible to define habitat critical to the survival of Riek's Crayfish as there are insufficient data. Therefore, all its known, peripheral, and likely habitat in the highlands of the Australian Alps is critical to the survival of this species (Morgan 1997).

Habitat critical to the survival should not be cleared, fragmented or degraded. Any known or likely habitat (Map 1) should be considered as habitat critical to the survival of the species. Additionally, areas that are not currently known to be occupied by the species due to recent disturbance (e.g. fire, grazing or human activity), but should become suitable again in the future, should also be considered habitat critical to the survival of the species. It is essential that the highest level of protection is provided to these areas, across all tenures, and that enhancement and protection measures target these productive sites.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat under the EPBC Act.

Climate Change

Climate change impacts are inevitable and will affect the likelihood of persistence, within the ACT, of many species. Most vulnerable in this regard are those species that occupy highly fragmented habitat with highly restricted distributions, such as the Riek's Crayfish. Capacity must be developed to model the impact on the Riek's Crayfish and its habitat under likely climate change scenarios if we are to anticipate and manage the impacts of climate change. This will require a combination of research and the development of in-house capacity for the collection of relevant data and its application in climate change modelling.

Population Viability

With a threatened species, such as the Riek's Crayfish, the question often raised is whether the remaining population is viable into the future. That is, have the populations declined in abundance and become fragmented to such an extent, and has the genetic diversity of the species declined to such an extent, that the species no longer has the capacity to rebound should conditions improve or to respond to management intervention. Such an assessment may need to be undertaken in the case of the Riek's Crayfish, and if it is determined that the species population is not viable, to explore more intensive options for bringing the species to a position where it has the potential to recover, such as genetic rescue.

Jurisdictional Collaboration

The location of the species habitat in the ACT high country along the NSW border requires the development of any policies and action/recovery plans to be discussed between relevant jurisdictional entities.

Ngunnawal Community Engagement

The ACT Government should actively facilitate, the inclusion of the Ngunnawal people in the conservation of this species and its habitat as part of Ngunnawal Country. Reference to the draft Cultural Resource Management Plan (ACT Government in prep.) would be useful to inform culturally appropriate resource management including of native species that aligns with achieving conservation outcomes for the species.

OTHER RELEVANT ADVICE, PLANS OR PRESCRIPTIONS

- ACT Aquatic and Riparian Conservation Strategy (ACT Government 2018)
- ACT Conservation Advice – High Country Bogs and Associated Fens (ACT Government 2019b)
- ACT High Country Bogs and Associated Fens Ecological Community – Draft Action Plan (ACT Government 2023)
- Commonwealth Conservation Advice – Riek's Crayfish (DCCEEW 2023)
- Namadgi National Park Plan of Management (ACT Government 2010)

LISTING BACKGROUND

The Riek's Crayfish is listed as an Endangered species under the EPBC Act, effective 7 September 2023. It is assessed as Endangered under Criterion 2 (B2ab(iii,v)) of the EPBC Act. In 2024, under the *Nature Conservation Act 2014*, the ACT Scientific Committee recommended the Riek's Crayfish be listed in the Endangered category in the ACT Threatened Native Species List to align with the EPBC Act listing.

ACTION PLAN DECISION

The ACT Scientific Committee does recommend that the Minister for the Environment should make the decision to have an action plan for the species in the ACT under the *Nature Conservation Act 2014*. The

key habitat areas of the species in the ACT are in Namadgi National Park (most commonly above 1000 m asl) and its habitat is protected there but has not been actively managed for the conservation of Riek's Crayfish. The Commonwealth Conservation Advice (DEECCW 2023) and this Conservation Advice should be used to inform and support the priorities identified above. This especially includes the need for monitoring, and identifying and including the species and its habitat's needs in ecological guidelines for on-ground management.

A National Recovery Plan is not required to be prepared for the species (DCCEEW 2023).

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FURTHER INFORMATION

Further information on related action plans or other threatened species and ecological communities can be obtained from: Environment, Planning and Sustainable Development Directorate (EPSDD).

Phone: (02) 132281, EPSDD Website: <https://www.environment.act.gov.au/nature-conservation>.

ATTACHMENT A: LISTING ASSESSMENT ([DCCEEW 2023](#))

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Threatened Species Scientific Committee finalised this assessment on **DD Month Year**.

Attachment A: Listing Assessment for *Euastacus rieki* (Riek's crayfish)

Reason for assessment

The devastating bushfires that burnt more than 10.3 million hectares across southern and eastern Australia in 2019-20 severely impacted native wildlife and habitat. This created an urgent need for hundreds of species and ecological communities (ECs) to be assessed against EPBC Act criteria for threatened listing status, so that the recovery and future resilience of fire-affected species and ECs could be supported by statutory protection commensurate with their post-fire status, and to ensure EPBC Act lists are as current and accurate as possible, helping improve environmental resilience and preparedness for future fire events.

As part of the Australian Government's bushfire response the Department engaged scientific experts to deliver a number of Species Expert Assessment Plans (SEAPs) for groups of fire-affected and non-fire affected species and ECs that were affected by the 2019-20 fires, or could be affected by similar fire events in the future, to enable hundreds of species and ECs to be assessed against EPBC Act criteria for threatened listing status and improve the currency of EPBC Act lists in a timely manner.

This assessment follows evaluation of the conservation status of the species through the SEAP project.

Assessment of eligibility for listing

This assessment uses the criteria set out in the [EPBC Regulations](#). The thresholds used correspond with those in the [IUCN Red List criteria](#) except where noted in criterion 4, sub-criterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 3 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria.

Table 3 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	Unknown	Unknown	Unknown	Not known for this species.
Trend	n/a			
Generation time (years)	unknown	unknown	unknown	The longevity, fecundity, and age of sexual maturity in females is presently unknown for this species. In addition, there is little information available from other species of <i>Euastacus</i> .
Extent of occurrence	>5000 km ²	4476 km ²	>5000 km ²	Based on post-1990 published, and/or known survey and collection records (McCormack 2012; Lintermans 2021; ACT Government 2021; NSW DPI (Fisheries) 2021; Austin et al. 2022). Calculated using GeoCAT (Bachman et al. 2011).
Trend	Contracting			No long-term population data available, but given widespread threats from increasing feral horse abundance, severe drought, and two severe wildfires since 2000, subpopulations are assumed to be contracting.
Area of Occupancy	<500 km ²	180 km ²	<500 km ²	Based on post-1990 published, and/or known survey and collection records (McCormack 2012; Lintermans 2021; ACT Government 2021; NSW DPI (Fisheries) 2021; Austin et al. 2022). Calculated using GeoCAT (Bachman et al. 2011).
<p>AOO is a standardised spatial measure of the risk of extinction, that represents the area of suitable habitat known, <u>inferred</u> or projected to be currently occupied by the taxon. It is estimated using a 2 x 2 km grid to enable comparison with the criteria thresholds. The resolution (grid size) that maximizes the correlation between AOO and extinction risk is determined more by the spatial scale of threats than by the spatial scale at which AOO is estimated or shape of the taxon's distribution. It is not a <u>fine-scale</u> estimate of the actual area occupied. In some cases, AOO is the smallest area essential at any stage to the survival of existing populations of a <u>taxon</u> (e.g. breeding sites for migratory species).</p>				
Trend	Contracting			No long-term population data available, but given widespread threats from increasing feral horse abundance, severe drought, and two severe wildfires since 2000, subpopulations assumed to be contracting. Contracting due to habitat loss/degradation associated with feral animals and climate change.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of subpopulations	>10	>10	>10	Species has a relatively wide distribution in the high country with subpopulations separated by lower altitude valleys and forests (from which the species is largely absent). Low vagility means that substantial areas of unsuitable habitat prevent inter-population dispersal.
Trend	contracting			No long-term population data available, but given widespread threats from increasing feral horse abundance, severe drought, and two severe wildfires since 2000, subpopulations are assumed to be contracting.
Basis of assessment of subpopulation number	The species has low vagility and so distributional disjunct populations are assumed to be genetically separate.			
No. locations	1	1	1	Increased temperatures associated with climate change will impact all of the range of the species simultaneously.
Trend	stable			Broad spatial range is thought to be contracting (particularly in NSW) but number of locations is stable.
Basis of assessment of location number	Increased temperature will almost certainly affect the entire range, and therefore it is considered a single location.			
Fragmentation	Not severely fragmented – no parameter was changed by an order of magnitude by the 2019-20 fire.			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals – no parameter was changed by an order of magnitude by the 2019-20 fire.			

Criterion 1 Population size reduction

Reduction in total numbers (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.		(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
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

Criterion 1 evidence

Eligible under Criterion 1

Insufficient data to determine eligibility

There are insufficient data to determine eligibility of the Riek's crayfish for listing under Criterion 1. Only part of the range (e.g., ACT) has been subject to population monitoring since its description in 1997, however a survey (Lintermans 2021) provided data in its range in southern NSW. Population size has not been determined for any subpopulation.

It is projected that there will be a future reduction in population size of the Riek's crayfish due to the impacts of climate change. This species, and other likely cool-adapted species of crayfish, do not have the capacity to adapt to the current or projected rates of warming (see Threats Table 1 above). A decline in Area of Occupancy (AOO), Extent of Occupancy (EOO) and quality of habitat is anticipated due to climate change as increasing temperatures and reduced moisture availability displaces flora and fauna upslope, including the alpine rainforest habitat of this species.

A report by the National Environmental Science Programme (NESP) Threatened Species Recovery (TSR) Hub (Legge et al. 2021) estimated a future population decline of 9 % in the Riek's crayfish over the next three generations, but potentially as much as 25 % (bound of 80 % confidence limit). This was done using a structured expert elicitation process.

The Committee considers that there is insufficient information to determine the eligibility of the species for listing in any category under this criterion.

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, <u>inferred</u> 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			

Criterion 2 evidence

Eligible under Criterion 2 B2ab(iii,v) for listing as Endangered

The existing distribution of Riek’s crayfish is confined to the high country of the western and southern ACT and southern NSW (Morgan 1997). Whilst the species can occur as low as 560 m elevation, it is generally found in sub-alpine and alpine environments above 1000 m above sea level (Morgan 1997). Historical post-1990 records and recent survey (Lintermans 2021) along with molecular analysis (Austin et al. 2022) helped to resolve the range of the species. The species has a restricted distribution: minimum EOO of 4476 km² and AOO of 180 km². The AOO is well below the threshold (500 km²) for the Endangered category under Criterion B2. The EOO is just below the threshold for listing as Endangered (5000 km²), however the EOO is 90 % of this figure. Only one or two more new sites within the large amount of adjacent similar habitat would increase the EOO to above this threshold, as would a finding that there are *E. rieki sensu stricto* within the Victorian population of *E. cf. rieki* (see Taxonomy and Distribution above). Therefore, the likely EOO of Riek’s crayfish is probably greater than 5000 km² and so would qualify as Vulnerable under B1.

A synergistic threat to Riek's crayfish from fire is increased terrestrial predation by predators such as foxes (*Vulpes vulpes*) and wild dog/dingo (*Canis lupus* and *Canis lupus dingo*) in burnt landscapes. Fire removes riparian vegetation which provides cover to crayfish when emerging from burrows or traversing semiaquatic habitats such as bogs. Dramatic increases in predated crayfish remains have been observed following fires (Carey et al. 2003) and recent evidence from the 2019/20 fires has documented > 90 % of predator scats collected around upland bogs in the ACT contained crayfish remains. (ACT Government 2021). This fire-related predation along with habitat degradation would substantially reduce the number of mature individuals (sub-criterion b (v)). The spatial extent of the threat from fires is not fixed for any one fire, and will vary with ignition point, fuel loads, antecedent climatic conditions (e.g., rainfall/drought) and weather variables. Consequently, individual fires are likely to impact different locations, with the entire distribution of Riek's crayfish cumulatively at risk.

The broad and cumulative extent of the 2019/2020 fires, and significant extent of feral horse habitat disturbance results in an assessed number of locations of ≤ 5 . The projected increase in fire frequency and continuing decline inferred or projected in area, extent and/or quality of habitat due to climate change (increasing temperature, and increasing bushfires) and other threats (sub-criterion b (iii)) in conjunction with an AOO of 180 km², and number of locations ≤ 5 meets the threshold for listing as Endangered under Criterion B2.

The Committee considers that the species' AOO is restricted, and the number of locations is restricted, and continuing decline is inferred in EOO, AOO, area, extent and or quality habitat, and number of mature individuals. Therefore, the species has met the relevant elements of Criterion 2 to make it eligible for listing as Endangered.

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			

Criterion 3 evidence

Insufficient data to determine eligibility

The estimated total number of mature individuals of this species is unknown, and the number and proportion of individuals in each population or subpopulation is also unknown.

The data presented suggest that there are **insufficient data** to demonstrate if the species is eligible for listing under this criterion.

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2. ¹ <i>Only applies to the Vulnerable category</i> Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to Critically Endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km ² or number of locations ≤ 5

¹ The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the [common assessment method](#).

Criterion 4 evidence

Insufficient data to determine [eligibility](#)

The estimated total number of mature individuals of this species is unknown. The data presented suggest that there are **insufficient data** to demonstrate if the species is eligible for listing under 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

Criterion 5 evidence

Insufficient data to determine eligibility

Population viability analysis has not been undertaken. Therefore, there is insufficient information to determine the eligibility of the species for listing in any category under this criterion.

Adequacy of survey

The survey effort following the 2019-20 bushfires has been considered adequate and there is sufficient scientific evidence to support the assessment.

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 32 business days between 14 December 2022 and 30 January 2023. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process and provided to the Minister for the Environment with the Committee's advice.

Listing and Recovery Plan Recommendations

The Threatened Species Scientific Committee recommends:

- i) that the list referred to in section 178 of the EPBC Act be amended by **including** *Euastacus rieki* in the list in the Endangered category.
- ii) that there not be a Recovery Plan for *Euastacus rieki* in accordance with the provisions of the EPBC Act and the Committee's conservation planning principles as follows:
 - An approved conservation advice is an effective, efficient and responsive document to guide the implementation of priority management actions, mitigate key threats and support the recovery for this EPBC Act listed Endangered species.
 - An approved conservation advice would support the species recovery by identifying priority actions, stakeholders for engagement, and the survey and research priorities to facilitate a better understanding of key threats as well as biological and ecological knowledge gaps.
 - The threats facing the entity, and the recovery actions needed can most effectively be guided via an approved conservation advice.

- *Euastacus rieki* is endemic to the high country of the Australian Capital Territory and southern New South Wales. The species is recorded from the tributaries of the upper Snowy, upper Murrumbidgee and upper Murray rivers, and is commonly found in the high country of Kosciuszko National Park, and Namadgi National Park.
- The species is primarily threatened by habitat destruction, pollution, invasive and translocated native species, human exploitation, climate change and related changes to fire and flooding events.
- The species has a restricted distribution and coordination of recovery effort is restricted to a few key stakeholders. The threats facing the species, and the recovery actions needed, are well-understood and can be appropriately guided by a conservation advice.

Having regard to the above factors, a recovery plan is not required as it would not provide a significant conservation planning benefit above existing mechanisms.