Australian Government
Department of Climate Change, Energy, the Environment and Water

Consultation on Species Listing Eligibility and Conservation Actions

Melanotaenia sp. nov. 'Running River' (Running River rainbowfish)

You are invited to provide your views and supporting reasons related to:

1) the eligibility of '*Melanotaenia* sp. nov. 'Running River' (Running River rainbowfish) for inclusion on the EPBC Act threatened species list in the Critically Endangered category; and

2) the necessary conservation actions for the above species.

The purpose of this consultation document is to elicit additional information to better understand the status of the species and help inform on conservation actions and further planning. As such, the below draft assessment should be considered to be **tentative** as it may change following responses to this consultation process.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Responses are to be provided in writing by email to:
ExpertAssessmentPlans@environment.gov.au

Please include species scientific name in Subject field.

or by mail to:

The Director
Threatened Species and Communities Governance Section
Department of Climate Change, Energy, the Environment and Water
John Gorton Building, King Edward Terrace
GPO Box 858
Canberra ACT 2601

Responses are required to be submitted by Wednesday 24 August 2022.

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General background information about listing threatened species

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at: https://www.dcceew.gov.au/environment/biodiversity/threatened

In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at: https://www.dcceew.gov.au/sites/default/files/env/pages/d72dfd1a-f0d8-4699-8d43-5d95bbb02428/files/tssc-guidelines-assessing-species-2021.pdf

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at: https://www.dcceew.gov.au/environment/biodiversity/threatened/nominations

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 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. Information about the SEAPs project is available at: https://www.dcceew.gov.au/environment/biodiversity/threatened/seap
This assessment follows evaluation of the conservation status of the species through the SEAPs project.

To promote the recovery of listed threatened species and ecological communities, Conservation Advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at: https://www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans

Privacy notice

The Department will collect, use, store and disclose the personal information you provide in a manner consistent with the Department's obligations under the Privacy Act 1988 (Cth) and the Department's Privacy Policy.

Any personal information that you provide within, or in addition to, your comments in the threatened species assessment process may be used by the Department for the purposes of its functions relating to threatened species assessments, including contacting you if we have any questions about your comments in the future.

Further, the Commonwealth, State and Territory governments have agreed to share threatened species assessment documentation (including comments) to ensure that all States and Territories have access to the same documentation when making a decision on the status of a potentially threatened species. This is also known as the 'Common Assessment Method' (CAM). As a result, any personal information that you have provided in connection with your comments may be shared between Commonwealth, State or Territory government entities to assist with their assessment processes.

The Department's Privacy Policy contains details about how respondents may access and make corrections to personal information that the Department holds about the respondent, how respondents may make a complaint about a breach of an Australian Privacy Principle, and how the Department will deal with that complaint. A copy of the Department's Privacy Policy is available at: https://www.dcceew.gov.au/about/commitment/privacy

Information about this consultation process

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

Consultation questions for *Melanotaenia* sp. nov. 'Running River' (Running River rainbowfish)

PART 1 – INFORMATION TO ASSIST LISTING ASSESSMENT

1. Do you have any additional information on the **ecology or biology** of the species?

2. Can you provide any additional information or estimates on **longevity, average life span or generation length** for the species?

3. Do you have additional information to support an **estimate of the current population size** of mature adults of the species (national extent)?

4. Do you have additional information on **population trends** over 3 generations, or an historic population size for the species (national extent)?

5. Do you have additional information on **current range** (national extent) or **location of populations** for the species?

6. Can you provide additional information on any **change in range** or **location of populations**, or an **historic range** (national extent)?

PART 2 – INFORMATION FOR CONSERVATION ADVICE ON THREATS AND CONSERVATION ACTIONS

7. Do you have further information on the historic, current or potential **threats** facing the species?

8. Do you have further information on current or potential **management actions** to support protection and recovery of the species?

9. Do you have further information on current or potential **monitoring** or **research activities** for the species?

10. Are you aware of **other knowledge** (e.g., traditional ecological knowledge) that may help better understand the threats and management actions to aid recovery of the species?

11. Are you aware of any **cultural importance or use** that the species has?

12. What **individuals or organisations** are currently, or potentially could be, involved in management and recovery of the species?

PART 3 – ANY OTHER INFORMATION

13. Do you have comments on **any other matters** relevant to the assessment of this species?

DRAFT - Conservation Advice for *Melanotaenia* sp. nov. 'Running River' (Running River rainbowfish)

This draft document is being released for consultation on the species listing eligibility and conservation actions

The purpose of this consultation document is to elicit additional information to better understand the status of the species and help inform conservation actions, further planning and a potential recovery plan. The draft assessment below should therefore be considered **tentative** at this stage, as it may change as a result of responses to this consultation process.

Note: Specific consultation questions relating to the below draft assessment and preliminary determination have been included in the consultation cover paper for your consideration.

This document combines the approved Conservation Advice and Listing Assessment for the species. It provides a foundation for conservation actions and further planning.

Melanotaenia sp. nov. *Running River* © Copyright, Michael Jones

Conservation status

Melantotaenia sp. nov. 'Running River' (Running River rainbowfish) is proposed to be listed in the Critically Endangered category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act).

The Running River rainbowfish was assessed by the Threatened Species Scientific Committee (the Committee) to be eligible for listing as Critically Endangered under Criteria 1 and 2. The Committee's assessment is at Attachment A. The Committee's assessment of the species' eligibility against each of the listing criteria is:

- Criterion 1: A3be+4ae: Critically Endangered
- Criterion 2: B1ab(i,ii,iii,v): Critically Endangered
- Criterion 3: Insufficient data
- Criterion 4: Insufficient data
- Criterion 5: Insufficient data

The main factor that makes the species eligible for listing in the Critically Endangered category under Criterion 1 is the inferred very severe population reduction from continuing rapid and extensive hybridisation with the introduced *Melanotaenia splendida*. The main factors that make the species eligible for listing in the Critically Endangered category under Criterion 2 are its restricted Extent of Occurrence (EOO), its restriction to only one location, and the continuing decline in the Area of Occupancy (AOO), EOO, quality of the species' habitat and number of mature individuals.

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see the Species Profile and Threat Database.

Species information

Taxonomy

An undescribed, newly-recognised species conventionally accepted as *Melanotaenia* sp. nov. 'Running River' (Unmack & Hammer 2015; Unmack 2016; Hammer et al. 2019). The species is currently being described (M Hammer 2021. Pers. comm. 27 October).

Running River rainbowfish has long been recognised as having different morphology and considered a potentially different species (Pusey et al. 2004; Martin & Barclay 2016), but it has only more recently been recognised as an undescribed species within the *Melanotaenia* genus of Australian rainbowfishes (Unmack 2016). The rainbowfish from Running River have long been recognised as different to eastern rainbowfish (*Melanotaenia splendida splendida*) by aquarists (Unmack & Hammer 2015).

Description

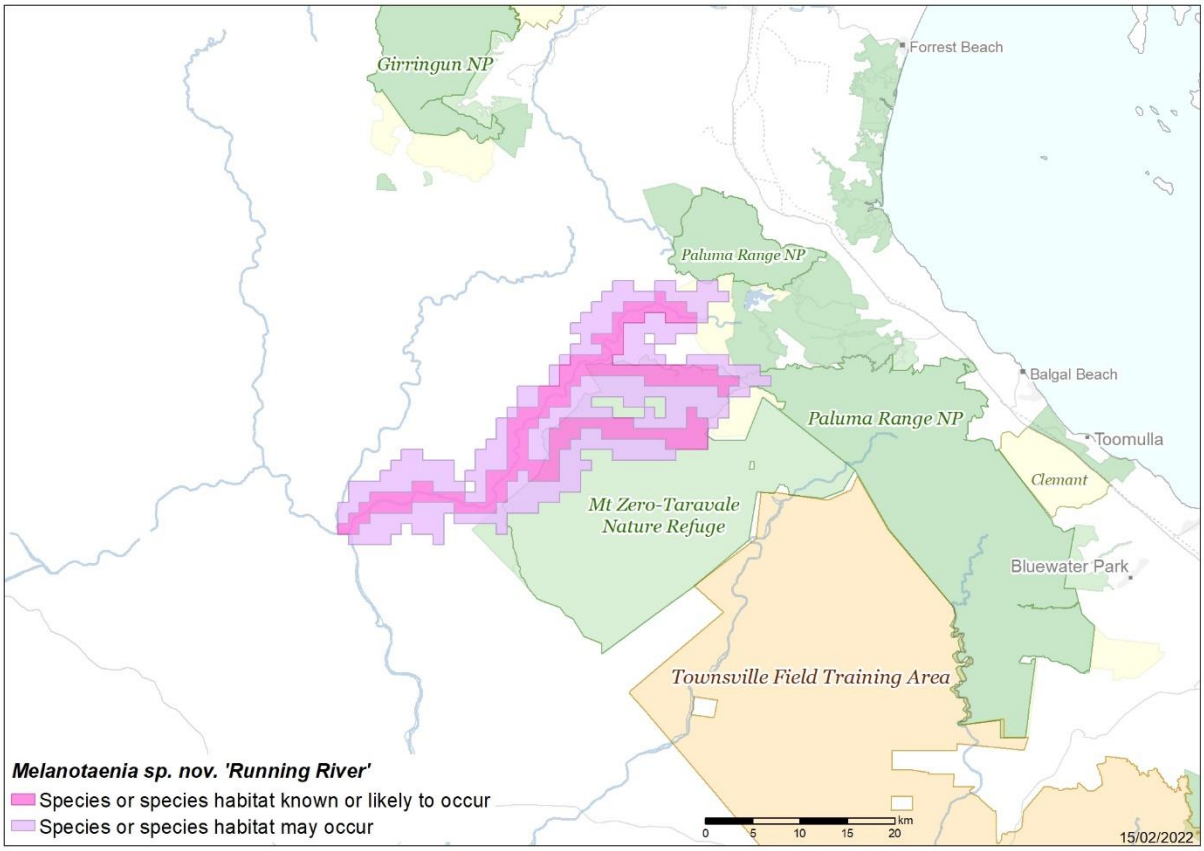
Characteristic of the *Melanotaenia* genus, Running River rainbowfish are a small (to ~60 mm) laterally compressed, deep-bodied species with males being larger than females and more brightly coloured (Martin & Barclay 2016). A short-based first dorsal fin is followed by a much longer second dorsal, and the anal fin is long, with caudal fin slightly forked; the body colour is silver anteriorly, especially on the head and nape, with the posterior two thirds of the body blending to a deep golden background colouration (Martin & Barclay 2016). Whilst it does not co-occur naturally with other *Melanotaenia*, golden to green bodies, bright red fins lacking spots and distinctive black zig-zag lines on their flanks (Unmack & Hammer 2015) distinguish it from the larger eastern rainbowfish, which abuts its range in the Burdekin River Catchment and has invaded the Running River following translocation (Unmack 2016).

Distribution

The Running River rainbowfish is endemic to the Running River in the Burdekin River Catchment in the Dry Tropics of northern Queensland (Unmack & Hammer 2015; Hammer et al. 2019). The species naturally occurs in 13 km of the mainstem of Running River between two gorges which are located 24-25 km upstream of the confluence with the Burdekin River. The lower gorge limits the upstream distribution of a natural population of the congeneric eastern rainbowfish and the upper gorge is thought to limit the upstream extent of Running River rainbowfish (Unmack & Hammer 2015; Hammer et al. 2019). However, the population is predicted to be extinct by 2025 as hybridisation is occurring with translocated eastern rainbowfish, initially introduced somewhere above the upper gorge and now moving down through the system (Unmack & Hammer 2015; Unmack 2016, Hammer et al. 2019). In 2016 and 2017, two translocations of captively-bred genetically pure Running River rainbowfish occurred into two Running River tributary creeks (Deception and Puzzle creeks respectively) with both creeks demonstrating successful breeding and persistent populations until 2019 (when last sampled) (Moy & Unmack 2017; Moy 2018; Hammer et al. 2019).

The distribution of the mainstem Running River rainbowfish population overlaps with the Hidden Valley Recreation Reserve and freehold cattle properties, whereas the populations in Deception and Puzzle creeks are found in the Mount Zero-Taravale Nature Refuge.

Map 1 Modelled distribution of Running River rainbowfish



Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.
Caveat: While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.
Species distribution mapping: The species distribution mapping categories are indicative only and aim to capture (a) the habitat or geographic feature that represents recent observed locations of the species (known to occur) or habitat occurring in close proximity to these locations (likely to occur); and (b) the broad environmental envelope or geographic region that encompasses all areas that could provide habitat for the species (may occur). These presence categories are created using an extensive database of species observations records, national and regional-scale environmental data, environmental modelling techniques and documented scientific research.

Cultural and community significance

The cultural, customary and spiritual significance of species and the ecological communities they form are diverse and varied for Indigenous Australians and their stewardship of Country. This section describes some examples of this significance but is not intended to be comprehensive or applicable to, or speak for, Indigenous Australians. Such knowledge may be held by Indigenous Australians who are the custodians of this knowledge and have the rights to decide how this knowledge is shared and used.

The Running River rainbowfish occur on the lands of the Gugu-Badhun people (AIATSIS 2021). The cultural significance of the Running River rainbowfish is currently unknown. However, given the acknowledged importance to Aboriginal peoples of Connection to Country and the widespread importance of Caring for Country (which includes biodiversity, 'place', custom and totemic elements) it is considered likely that the species has or is associated with some cultural and/or community significance.

Ascertaining further details on the cultural significance of this species is a priority in the Conservation and Recovery Actions.

Relevant biology and ecology

The biology of the Running River rainbowfish is not well known. However, most rainbowfishes are generalist species which can inhabit a broad range of environments (Pusey et al. 2004; Hammer et al. 2019).

The longevity, fecundity, and age of sexual maturity in the wild of females is presently unknown for the Running River rainbowfish. It was found in a captive breeding facility that fish are still alive after 6 years in captivity (although a maximum longevity of ~3–4 years is normal for wild populations of other rainbowfish) (Pusey et al. 2004). In captivity fish produce up to ~60–80 eggs a day and can potentially reach maturity at around 3–4 months of age under optimal captive husbandry conditions (Moy et al. 2018, Moy 2018, Hammer et al. 2019, Moy et al. 2019; Unmack 2021, unpublished data; Moy 2021, unpublished data). Like other rainbowfish, it is expected that females attach eggs amongst submerged vegetation or root mats (Pusey et al. 2004), although wild spawning sites have not yet been documented.

This species has been found in rocky reaches in the two gorges with a broader sand-based channel in the reach between them (Hammer et al. 2019). In the reintroduced subpopulations in Deception and Puzzle Creeks, the species is most commonly found in larger rocky or sandy pools, but they will move further upstream into more ephemeral areas but would perish as they dry out. Adults mostly swim in open water in loose schools, with juvenile fish found more in shallow waters or areas away from larger fish.

The Burdekin River Catchment is the fifth-largest in Australia draining 130,000 km^2 (Wohl 1992; Pusey et al. 1998). Annual precipitation varies across the system from 550 mm in the south to 750 mm in the north. Precipitation and streamflow are highly seasonal with as much as two thirds of the yearly discharge occurring in February or March from monsoonal rains (Wohl 1992) with floodwaters rising precipitously, often by two to four orders of magnitude in a day, maintaining peak flow for up to a few days, and receding exponentially (Fielding & Alexander 1996). The Running River occurs in the northeast of the Burdekin drainage with Running River rainbowfish occurring at an elevation of between 400 m and 650 m. (Martin & Barclay 2016). The river is perennial flowing through sandy and rocky substrates with fringing riparian vegetation dominated by *Melaleuca* species. Water temperatures frequently exceed 30°C in late spring (Pusey et al. 1998) and likely approach mid to high 30s in summer/autumn. The species co-occurs with three other native species in Running River including *Leiopotherapon unicolor* (spangled perch), *Mogurnda adspersa* (southern purple-spotted gudgeon) and *Hephaestus fuliginosus* (sooty grunter). In the translocated populations in the Puzzle and Deception creeks the species co-occurs with spangled perch and southern purple-spotted gudgeon, although the latter appears quite rare in Deception Creek.

The diet of the Running River rainbowfish is unknown but is likely to be omnivorous similar to other rainbowfish where algae and small aquatic invertebrates form the bulk of dietary items, but terrestrial insects from the water surface are also consumed (Pusey et al. 2004). Dietary studies on eastern rainbowfish (of which Running River rainbowfish were previously included) in the Burdekin River reported increased importance of algae in the diet with increasing fish size, with algae less important during the wet season, presumably related to increased abundance of small invertebrates during the wet season (Pusey et al. 2004).

General biological and ecological characteristics of Running River rainbowfish are largely unknown as are the actual, growth rates, population sizes and generation lengths, but are likely similar to eastern rainbowfish.

Habitat critical to the survival

The specific habitat requirements of Running River rainbowfish are unknown, but like many rainbowfish, it is likely to be a generalist capable of using a variety of flow, depth and substrate conditions (Pusey et al. 2004).

Habitat critical to the survival of the species includes:

- All known streams where the species is currently found or has previously been found, including translocated subpopulations.
- Hydrologically connected tributary streams in the Running River catchment that have the required substrate, riparian vegetation and water quality characteristics within 25 km of known sites (e.g., habitat that will be available in the future for translocated subpopulations).
- Native riparian vegetation surrounding known and potential habitat, particularly native vegetation that provides shading and litter input to creeks and streams.

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

Important populations

In this section, the word 'population' is used to refer to a subpopulation, in keeping with the terminology used in the EPBC Act and state/territory environmental legislation.

The number of mature adults is unknown, but the species has a very restricted range, with only a single natural population (the Running River mainstem excluding the two translocated tributary populations) that is predicted to be extinct as a result of hybridisation with eastern rainbowfish by 2025. Two recently introduced tributary subpopulations (Deception and Puzzle creeks) where eastern rainbowfish are blocked from colonisation by large waterfall barriers, are therefore critically important populations. These reintroduced populations are isolated from each other with movement between them prevented by the waterfall barriers and the hybrid zone of the mainstem Running River. The two tributary populations are afforded a degree of protection as they occur on a property (Mt Zero – Taravale Station) that is actively managed for conservation outcomes by the Australian Wildlife Conservancy.

Threats

Established threats (invasive translocated native fish species), and events associated with climate extremes, put Running River rainbowfish at severe risk of population declines, or extinction, over the near future (Hammer et al. 2019; Moy et al. 2019). The Running River subpopulation has declined by at least 77% over a 6-year timeframe between 2013 – 2019 as a result of hybridisation with eastern rainbowfish and is considered unlikely to persist as this process is ongoing (Hammer et al. 2019; Unmack & Hammer 2021, unpublished data). An investigation of the pre and post-zygotic barriers to hybridisation between Running River rainbowfish and the introduced eastern rainbowfish found no significant difference in egg hatching rate between inter and intra-species pairings, and no mate choice based on size (eastern rainbowfish are larger) or species. This absence of identifiable barriers to hybridisation highlights that the translocation of native fish species outside their natural range poses a higher risk of hybridisation than previously thought (Moy et al. 2019).

The two translocated tributary subpopulations are yet to be considered as established and are still at extreme risk from unauthorised releases of, or colonisation by, eastern rainbowfish. As rainfall and streamflow are highly episodic in the Burdekin River Catchment (Wohl 1992; Fielding & Alexander 1996), small tributary streams may only hold water for days to weeks (Pusey et al. 1998). Whilst Deception and Puzzle creeks are moderate-sized tributaries that may cease to flow outside the wet season, in normal years they still have large pools that act as refugia during such cease to flow periods (Unmack & Hammer, unpublished data; Moy 2021, unpublished data). The persistence of these pools during drought years is unknown, but the presence of other aquatic biota that requires permanent water suggests complete drying is unlikely, but pools could be significantly reduced in number, extent and quality. However, climate change is projected to result in increased frequency in extreme events such as drought and bushfire (Abatzoglou & Williams 2016; Goss et al. 2020; Halofsky et al. 2020) and so desiccation of these refuge pools associated with drought is likely to be a severe impact to the translocated subpopulations. Associated with drought is an increased dryness of fire fuels and a risk of increased frequency, extent and severity of bushfires and storms (Deb et al. 2020; Nolan et al. 2020). Post-fire sedimentation can impact waterways 50–80 km downstream of the burnt area (Lyon & O'Connor 2008; Silva et al. 2020) and have severe effects on water quality and aquatic fauna including threatened fish (Bixby et al. 2015; Legge et al. 2021). Water quality impacts include lowered dissolved oxygen concentration dropping to lethal levels as well as inputs of other chemicals (Harper et al. 2019) that can result in cumulative sub-lethal impacts. Drought and fire are identified as key threats to Australia's most imperilled freshwater fish, including Running River rainbowfish (Lintermans et al. 2020).

Running River rainbowfish are restricted to three isolated subpopulations with two in unconnected tributary streams, which have limited capacity to disperse and recolonise sites from which local extirpation has occurred. With Running River rainbowfish being a small-bodied species with small range size, there is an increased risk of species extinction as the impact of, and recovery from, threats, such as habitat loss and fragmentation is anticipated to be more pronounced (Olden et al. 2007, Kopf et al. 2017, Lintermans et al. 2020). All individuals in the population of this species are at considerable risk of extirpation by events such as extensive fires, extreme flooding, drought, introduction of disease or invasion of non-native rainbowfish. It has been listed as one of 22 freshwater fish considered likely to become extinct within 20 years (Lintermans et al. 2020). The existing threats (incursion of and hybridisation with introduced eastern rainbowfish) and future threats (habitat loss during extreme drought or following fire and subsequent rain events) could all potentially rapidly eliminate all individuals in the population.

Table 1 Threats

Threats in Table 1 are noted in approximate order of highest to lowest impact, based on available evidence.

Threat	**Status** [a]	**Evidence**
Introduced species		
Invasion by non-native *Melanotaenia* species (e.g. *Melanotaenia splendida splendida*)	• Timing: current and future • Confidence: observed • Likelihood: almost certain • Consequence: catastrophic • Trend: increasing • Extent: across the entire range	The sole natural population of Running River rainbowfish has been extensively invaded by eastern rainbowfish since 2015, resulting in hybridisation (Hammer et al. 2019). The two translocated tributary populations of Running River rainbowfish in Deception and Puzzle creeks are also at risk from unauthorised liberation of non-native rainbowfish. This threat of invasion and hybridisation by non-native *Melanotaenia* is common to several species of threatened rainbowfish (Unmack et al. 2016; Brown et al. 2019). The timing of the initial establishment of non-native rainbowfish in the Running River catchment is unknown, with eastern rainbowfish reported from Paluma Dam (~27 km upstream of the Running River rainbowfish population) since 2004 (but not downstream) (Burrows 2004; Unmack & Hammer 2015). Translocations of native fish have been historically widespread in the Wet Tropics region including the Burdekin catchment (Burrows 2004). The vector for translocation of eastern rainbowfish is unknown but likely a result of introduction of forage fish for recreationally desirable species, discarding of bait fish used in recreational fishing or discarding unwanted aquarium specimens; with the above vectors commonly observed in invasive freshwater fish establishment in Australia (Lintermans 2004).

Threat	**Status** [a]	**Evidence**
Dams & water management/ use	• Timing: future • Confidence: suspected • Likelihood: possible • Consequence: minor/moderate • Trend: n/a • Extent: across the entire range	Artificial impoundments provide locations for introduction and establishment of additional alien fish populations which can then expand into adjacent lotic habitats (Burrows et al. 2004; Clavero et al. 2004). Alien fish commonly impact on native species via predation, competition and introduction of disease and parasites (Strayer 2010; Arthington et al. 2016; Ward et al. 2021). Running River is a tributary to the Burdekin River. The Burdekin River was identified as the potential location for the Hells Gates Dam Project, which would store around 2,100 GL of water in the Upper Burdekin catchment (Hells Gates Project 2022). The business case for the project is scheduled for delivery in April 2022.
Climate Change		
Extreme drought	• Timing: current and future • Confidence: inferred • Likelihood: possible • Consequence: major • Trend: increasing • Extent: across the entire range	Climate change globally is predicted to result in changed rainfall patterns and an increase in extreme weather events (Abatzoglou & Williams 2016; Goss et al. 2020; Halofsky et al. 2020). Since 1910 average temperature rises in the Monsoonal North region (which contains the Burdekin Dry Tropics region including Running River) of between 0.9˚C and 1.0˚C have been recorded and it is predicted that temperatures will rise by >1.3˚C compared to the baseline (1986-2005) by the end of the century (Moise et al. 2015). The future climate of the dry tropics is projected to be warmer and with more variable and intense rainfall (Moise et al. 2015). Predictions for change in mean rainfall are variable, (both increased and decreased rainfall) highlighting the need to consider the possibility of both drier and wetter conditions (Moise et al. 2015). Projected changes to drought share much of the uncertainty of mean rainfall change, so there is not a clear indication on changes to drought conditions in the Monsoonal North (Moise et al. 2015). The Monsoonal North was clearly affected by the Federation drought and the World War II drought in the early part of the 20th century, but the Millennium drought was not as pronounced (Moise et al. 2015). Moise et al. (2015) note that increases in rainfall variability could lead to increased drought duration and frequency. Drought and desiccation in the tributaries of Running River (which are predicted to be the only remaining populations of Running River rainbowfish) will have major impacts on habitat availability.

Threat	Status [a]	Evidence
Fire-caused sedimentation events	• Timing: current and future • Confidence: inferred • Likelihood: possible • Consequence: major • Trend: increasing • Extent: across the entire range	The number of days with a 'severe' fire danger rating is generally low in the Monsoonal North in the current climate, but increases by around 25% under RCP4.5, to 40% under RCP8.5 by 2030, and 45% under RCP4.5 by 2090 to 120% under RCP8.5 by 2090 (Moise et al. 2015 using the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report; IPCC 2013). In the Monsoonal North, when and where fire does occur, there is high confidence that fire behaviour will be more extreme (Moise et al. 2015). Storm events following fire usually result in significant inputs of ash and sediment to streams which severely impact aquatic habitats. Post-fire sedimentation can impact waterways 50–80 km downstream of the burnt area (Lyon & O'Connor 2008; Silva et al. 2020) and have severe effects on water quality and aquatic fauna including threatened fish (Bixby et al. 2015; Legge et al. 2021). Fire impacts on aquatic systems can be extreme, and where species have very restricted distributions (such as Running River rainbowfish) fire impacts on streams is a significant threat (Lintermans et al. 2010).The risk of fire impacts will affect the extent of suitable habitat available to Running River rainbowfish.
Exploitation		
Harvesting of fish by aquarium hobbyists	• Timing: past, current and future • Confidence: suspected • Likelihood: likely • Consequence: minor • Trend: unknown • Extent: unknown	Collection of wild specimens by aquarium hobbyists could have a direct impact on subpopulations and cause local extinctions especially if collections happen during periods of low population numbers. It is known that Running River rainbowfish collection by aquarists has occurred previously, but the magnitude and/or frequency of collection following description and listing is unknown.

[a]Timing—identifies the temporal nature of the threat
Confidence—identifies the nature of the evidence about the impact of the threat on the species
Likelihood—identifies the likelihood of the threat impacting on the whole population or extent of the species
Consequence—identifies the severity of the threat
Trend—identifies the extent to which it will continue to operate on the species
Extent—identifies its spatial context in terms of the range of the species

Categories for likelihood are defined as follows:
Almost certain – expected to occur every year
Likely – expected to occur at least once every five years
Possible – might occur at some time
Unlikely –known to have occurred only a few times
Unknown – currently unknown how often the threat will occur
Categories for consequences are defined as follows:
Not significant – no long-term effect on individuals or populations
Minor – individuals are adversely affected but no effect at population level
Moderate – population recovery stable or declining
Major – population decline is ongoing
Catastrophic – population trajectory close to extinction

Each threat has been described in Table 1 in terms of the extent that it is operating on the species. The risk matrix (Table 2) provides a visual depiction of the level of risk being imposed by a threat and supports the prioritisation of subsequent management and conservation actions. In preparing a risk matrix, several factors have been taken into consideration, they are: the life stage they affect; the duration of the impact; the spatial extent, and the efficacy of current management regimes, assuming that management will continue to be applied appropriately. The risk matrix and ranking of threats has been developed in consultation with experts and using available literature.

Table 2 Risk Matrix

Likelihood	**Consequences**				
	Not significant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain					Invasion by non-native *Melanotaenia* species
Likely		Harvesting of fish by aquarium hobbyists		Extreme drought Fire-caused sedimentation events	
Possible			Dam & water management		
Unlikely					
Unknown					

Risk Matrix legend/Risk rating:

Low Risk	Moderate Risk	High Risk	Very High Risk

Priority actions have then been developed to manage the threats, particularly where the risk was deemed to be 'very high' (red shading) or 'high' (orange shading). For those threats with an unknown or low risk (blue and green shading respectively) research and monitoring actions have been developed to understand and evaluate the impact of the threats, where appropriate.

Conservation and recovery actions

Primary conservation objective

Within 10 years, mitigate against hybridisation and catastrophic population loss, and increase total wild population size and number of translocated populations.

Conservation and management priorities

Invasive species (including threats from introgression)

- Maintain existing in-stream barriers to prevent incursion of eastern rainbowfish and other invasive fish species into translocated subpopulations of Running River rainbowfish (Deception and Puzzle creeks).

- Prevent any further incursions of introduced fish species into the Running River catchment and waterways where Running River rainbowfish occur.
- Continue monitoring extent of hybridisation with eastern rainbowfish in Running River mainstem.
- Establish an education program involving Government, Australian Wildlife Conservancy, the aquarium industry and peak groups (e.g., Australia New Guinea Fishes Association (ANGFA)) to develop education materials and messages to lessen risk of invasive fish, namely eastern rainbowfish or other rainbowfish.

Habitat loss, disturbance and modifications (including impacts of climate change)

- Where feasible, secure important subpopulations by implementing habitat buffers for riparian vegetation and revegetating riparian zones to protect these zones from agricultural (fencing, provision of off-stream watering points; nutrient or sediment input) or other impacts.
- Continue appropriate fire-fuel reduction activities to minimise severity/extent of future wildfires.
- Protect current and future translocated subpopulations that cross land tenures (private, government, NGO's) by developing and implementing land management agreements, in consultation with landholders, that incorporate actions that benefit both landholders and Running River rainbowfish.
- Identify and protect current and future areas likely to remain or become habitat due to climate change.
- Continue management activities to minimise impacts of surrounding land use on streams (limitations on water extraction from Deception and Puzzle creeks; retention of native forest) at known sites.

Breeding and other ex situ recovery action

- Engage and liaise with Australian Wildlife Conservancy, the Aquarium industry, peak groups such as ANGFA, and Government to investigate feasibility and plan for active conservation intervention(s), including ex situ initiatives such as:
  - Establishing captive husbandry facilities.
  - Allowing trade in captively-bred individuals to reduce harvest pressure on wild populations
  - Establishing captive breeding populations as a source of animals for insurance, and to augment the wild population, if required.
  - Establishing additional subpopulations in suitable tributary streams.

Stakeholder engagement/community engagement

- Engage with Traditional Owners, the Gugu-Badhun people, to investigate and document the cultural significance of the species and area and explore co-management and education opportunities.

- Increase understanding and recognition for broader impacts of fish translocation on native fishes in north Queensland.
- Engage with aquarists, peak groups (ANGFA) and aquarium industry (local, national) to raise awareness of threats to Running River rainbowfish and how aquarists might be involved in their conservation.

Survey and monitoring priorities

- Continue targeted surveys to identify appropriate streams, which are (or can be modified to be) suitable for the translocation of Running River rainbowfish.
- Establish (based on existing survey techniques plus eDNA), and then monitor the occupancy and population size and trajectory of Running River rainbowfish through time.
- Investigate utility of eDNA techniques for surveillance of Running River rainbowfish (including hybrids) and early detection of invasive fish.
- Establish surveillance program for early detection of eastern rainbowfish, other non-native rainbowfish and other invasive fish species.
- Determine the contemporary geographic distribution of the Running River rainbowfish.

Information and research priorities

- Complete formal taxonomic description of the species.
- Address knowledge gaps on of the biology, ecology and life history of the Running River rainbowfish in the wild including:
  - Reproductive timing
  - Size/age at maturity
  - Longevity
  - Movement and dispersal
  - influence of reproductive timing on recruitment success
  - predation from coexisting species
- Investigate the species' habitat requirements.
- Use population genetics to provide an estimate of effective population size, heterozygosity, and structure among the various subpopulations, which can also form a baseline for ongoing monitoring.
- Investigate the potential influence of climate change on the long-term survival prospects of the species, due to altered temperatures, rainfall patterns, bushfires, environmental stressors and diseases. This includes:
  - Establish the impacts of climate change on the species' habitat (vegetation assemblages, water availability, water and air temperatures).

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

Attachment A: Listing Assessment for *Melanotaenia sp. nov. 'Running River'*

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 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. The definition of each of the parameters follows the Guidelines for Using the IUCN Red List Categories and Criteria.

Table 3 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	n/a	n/a	n/a	There are insufficient data to estimate the number mature individuals.
Trend	declining			

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Generation time (years)	1	1	3	The longevity, fecundity, and age of sexual maturity in the wild of females is presently unknown for Running River rainbowfish. Reproductive parameters in a captive breeding facility found fish are still alive after 6 years in captivity (although a maximum longevity of ~3-4 years is normal for wild populations of other rainbowfish) (Pusey et al. 2004). In captivity, Running River rainbowfish can potentially reach maturity at around 3-4 months of age under optimal captive husbandry conditions (Moy et al. 2018, Moy 2018, Moy et al. 2019; Unmack 2021, unpublished data; Moy 2021 unpublished data; Hammer et al. 2019). The generation length used in this assessment is from Hammer et al. (2019) which is consistent with generation length for other similar rainbowfish (Brown et al. 2019).
Extent of occurrence	16 km^2 (Mainstem Running River population only) (mapped as 3.104km^2 but increased to 16 km^2 because EOO cannot be smaller than AOO)			Based on field surveys of the natural population in the mainstem Running River conducted in 2013, 2015, 2017, 2018, 2019 and 2021 (Unmack 2016; Unmack 2021, unpublished data; Moy 2021, unpublished data; Unmack & Hammer 2016). Note: the two translocated populations (to the tributaries Deception and Puzzle creeks) are not included in this EOO as it is premature to consider them established and self-sustaining (see below).
Trend	Stable			The native spatial distribution (13 km of the Running River mainstem) is unchanged, but by 2019 was characterised by 77% hybrid individuals with eastern rainbowfish (Unmack 2021, unpublished data) and is predicted to be extinct by 2025 (Unmack 2021, pers comm, September 2021). In 2016-17 the species was translocated to two tributaries of Running River where contemporary surveys indicated rainbowfish were absent (Moy & Unmack 2017). These two tributary subpopulations have not been established for at least five years and so are not included in the calculated EOO.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Area of Occupancy	16 km^2 (Mainstem Running River population only)			Based on field surveys conducted in 2013, 2015, 2017, 2018, 2019 and 2021 (Unmack 2016, Unmack & Hammer 2016; Unmack & Hammer, 2021, unpublished data)
AOO is a standardised spatial measure of the risk of extinction, that represents the area of suitable habitat known, inferred 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 fine-scale 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 taxon (e.g. breeding sites for migratory species).				
Trend	Stable			The native spatial distribution (13 km of the Running River mainstem) is unchanged, but by 2019 was characterised by 77% hybrid individuals with eastern rainbowfish (Unmack 2021, unpublished data) and is predicted to be extinct by 2025 (Unmack 2021, pers comm, September 2021). In 2016-17 the species was translocated to two tributaries of Running River where contemporary surveys indicated rainbowfish were absent (Moy & Unmack 2017). These two tributary subpopulations have not been established for at least five years and so are not included in the calculated AOO.
Number of subpopulations	1 (Mainstem native subpopulation) (translocated tributary subpopulations not included because it is premature to consider them established)			Based on field surveys conducted in 2013, 2015, 2016, 2017, 2018, 2019 and 2021 (Unmack 2016, Unmack & Hammer 2016; Unmack & Hammer 2021, unpublished data)
Trend	Stable (likely to slightly increase if and when tributary subpopulations establish, and mainstem subpopulation becomes extinct)			The mainstem subpopulation is predicted to be extinct by 2025 but the Deception and Puzzle creek subpopulations may establish.
Basis of assessment of subpopulation number	Periodic surveys of the known range of the species (Unmack 2016, Unmack & Hammer 2016; Unmack & Hammer 2021, unpublished data)			
No. locations	1			
Trend	Stable			
Basis of assessment of location number	All known sites for the species are contained within Running River catchment and primary threats apply to mainstem and tributary translocation (hybridisation with translocated native rainbowfish, climate change effects on drought and fire frequency and severity) (See Threats section in Conservation Advice), and therefore are considered a single location.			

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Fragmentation	The single Running River mainstem site is isolated from the two translocated tributary subpopulations by impassable waterfalls. Downstream connection from the two tributary subpopulations to the mainstem subpopulation is possible but upstream connection is not. Connection between the two tributary subpopulations is not possible because of the waterfall barriers and hybridisation zone in the mainstem Running River. There is insufficient information on the number of mature individuals (and their distribution across remaining subpopulations) to assess whether the population is severely fragmented: i.e., requiring 50% of the AOO to be in patches that are too small to support a viable population (IUCN Standards and Petitions Committee 2019).			
Fluctuations	Not known to be subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals.			

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.

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

Criterion 1 evidence

Eligible under Criterion 1 A3e+4e for listing as Critically Endangered

Using an assessment period of 10 years between 2012–21 (given that the three-generation length is estimated at three years), it is deemed that Running River rainbowfish is eligible for listing as Critically Endangered under Criterion 1.

The Running River rainbowfish has a highly restricted distribution, with its entire natural population known from one location (Running River Catchment, Queensland), which leaves the species susceptible to extinction from events such as extensive fires, extreme flooding, drought, or disease introduction, or other threats (see Criterion 2 below). Across this range, there has been an observed rapid increase in hybridisation with the translocated native eastern rainbowfish (*M. splendida splendida*) from 2015 to 2019, which have significantly reduced genetic integrity (Unmack 2016, Unmack & Hammer 2016; Unmack & Hammer 2021, unpublished data). Based on genetic sampling of 30 Running River rainbowfish fish per time period, an increasing trend in percentage of hybrid individuals from 30% in February 2016; 37% in August 2016; 63% in May 2017; 62% in October 2017; and 80% in May 2019 was revealed in the proximity of the invasion front of eastern rainbowfish. Over this time the percentage of pure Running River rainbowfish declined from 71% to 20% between 2016 and 2019. Approximately 3 km downstream, a similar increase is evident (e.g., 7% in August 2015; 38% in October 2017; 77% in June 2019).

In the lower reaches, at the edge of the ~13 km species' distribution (and furthest away from the upstream eastern rainbowfish invasion front), the increase in proportion of hybrids has been lower: August 2016 (4%), May 2017 (20%), October 2017 (15%) and May 2019 (77%) with pure Running River rainbowfish declining from 97% to 17% over the same time period (Hammer et al. 2019; Unmack & Hammer 2021, unpublished data). On the basis of these observations, a population reduction in the number of (pure) mature individuals is inferred. Overall, there has been at least at a 77% increase in hybridisation and reduction in the number of (pure) mature individuals between 2012 and 2019.

As the hybridisation threat has not ceased, it is projected that population reduction, in terms of the number of mature (pure) individuals, will continue. It is projected that 100% population reduction will occur between 2025-29 (Hammer et al. 2019; Unmack 2021, pers comm, September 2021). Whilst the extinction of Running River rainbowfish may be avoided by recent translocations to two tributaries of the Running River (Deception and Puzzle creeks) with an aim of establishing additional subpopulations, these translocations occurred at or less than five years ago and cannot be considered in this assessment (IUCN Standards and Petitions Committee, 2019) as the persistence of these subpopulations (i.e., whether these subpopulations are self-sustaining) is not certain. The projected 100% population reduction on the basis of increasing hybridisation, makes the species eligible for listing as Critically Endangered under Criterion A3(e). With the past observed and projected population reduction, the species is eligible for listing under A4(e).

The Committee considers that, given the combination of observed and projected population reductions, the species has met the relevant elements of Criterion 1 to make it eligible for listing as Critically Endangered.

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			

Criterion 2 evidence

Eligible under Criterion 2 B1ab(i,ii,iii,v) for listing as Critically Endangered.

The existing population of Running River rainbowfish is restricted to a single 13 km reach of the Running River mainstem between two gorges in the Burdekin River Catchment in northern Queensland. Periodic surveys between 2013 and 2021 of the species across the Running River (Unmack 2016, Unmack & Hammer 2016; Unmack & Hammer 2021, unpublished data) have confirmed the very restricted distribution of this species: EOO = 16 km² and AOO = 16 km² (using the recommended 2 x 2 km grid methodology: IUCN Standards and Petitions Committee 2019) across these surveys. EOO and AOO are essentially unchanged between 2013 and 2021 as pure individuals have been recorded at all sampling sites. The EOO meets the threshold for listing as Critically Endangered under Criterion B1 and the AOO meets the threshold for listing as Endangered under Criterion B2.

As the natural mainstem was comprised of 77% hybrid individuals in May 2019 (when last examined) and extinction of this population is predicted by 2025 (Unmack 2021, pers comm, September 2021), pure individuals are only considered as occurring in the two translocated populations in Deception and Puzzle creeks. However, although the two translocated populations in Deception and Puzzle creeks meet the IUCN guidelines for consideration in Listing Assessments (i.e., translocations were for conservation purposes - see section 2.1.3a,b,c of IUCN Standards and Petitions Committee (2019)) they do not (or just) meet 2.1.3d ("at least five years since the introduction") so long-term persistence (e.g., 10 years or three generations) is unknown. For this reason, the two tributary creek populations (Deception and Puzzle creeks) are not included in the calculated EOO for this assessment.

By 2025 when the mainstem population is likely extinct, and 8-9 years after translocation to Deception and Puzzle creeks (See IUCN Standards and Petitions Committee 2019) (Moy et al. 2018), the EOO of the two tributary subpopulations (currently 82.5 km^2) and AOO (currently 32 km^2) (assessed with the Geospatial Conservation Assessment Tool (GeoCAT: Bachman et al. 2011)) is likely to still meet the thresholds for Critically Endangered and Endangered for Criterion B1 and B2, respectively.

Under both the existing (mainstem only) and tributary translocation (with extinction of mainstem) scenarios above, the species still occupies a single location (IUCN Standards and Petitions Committee 2019) meeting the threshold for listing as Critically Endangered under subcriterion (a).

On the basis of surveys undertaken between 2015 and 2019, there has been an observed significant and rapid increase in the extent of hybridisation between Running River rainbowfish and eastern rainbowfish (and therefore loss of non-hybrid individuals) in the Running River mainstem. The spatial extent and incidence of this introgression is projected to reduce the EOO and AOO into the future, with the total loss of the Running River mainstem subpopulation by 2025 (Unmack 2021, pers comm, September 2021) thus satisfying subcriteria (b)(i,ii,iii,v). The tributary populations (Deception and Puzzle creeks) are currently not being impacted by hybridisation with eastern rainbowfish but the threat of introduction and hybridisation is still applicable. The future threats of habitat loss or degradation during extreme drought or following fire and subsequent rain events could all potentially rapidly eliminate all specimens in the taxon in these smaller, tributary streams.

The above data indicate the Running River rainbowfish has met the relevant elements of Criterion 2 to make it eligible for listing as **Critically 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**
	(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

There are no estimates of numbers of mature (pure) individuals or any population-decline census data that will allow assessment of the Running River rainbowfish for eligibility for listing under Criterion 3.

The Committee considers that there is insufficient information to determine the eligibility of the species for listing in any category 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] *Only applies to the Vulnerable category* 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 number of mature (pure) individuals of the Running River rainbowfish is not known, but is likely to exceed 1000 (Unmack 2021, pers comm, September 2021). The species is restricted to a single location with an AOO of tributary populations of 32 km^2 and so does not meet the requirements of Criterion 4.

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 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 is made available for public comment for a minimum of 30 business days. Any comments received relevant to the survival of the species are considered by the Committee as part of the assessment process.

Listing and Recovery Plan Recommendations

A decision about whether there should be a Recovery Plan for this species has not yet been determined. The purpose of this consultation document is to elicit additional information to help inform the decision.

Cataloguing data

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