Threatened Species Assessment

Melanotaenia fluviatilis
Murray River Rainbowfish

Taxonomy

Melanotaenia fluviatilis (Castelnau, 1878)

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1994).

Categorised as Vulnerable in the 2013 Advisory list of threatened vertebrate fauna in Victoria (DSE 2013).

Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The Murray River Rainbowfish is a small, freshwater, riverine fish, generally 28-37 mm, with males slightly larger than females. The colour is variable; adults are silvery-green on the sides and above, and whitish below, and scales have a brownish margin. Juveniles are translucent. The taxon is highly vagile and schooling. The species is sexually dimorphic, with mature males distinguished by long dorsal and anal fin rays. Breeding is seasonal, generally during spring-summer when water temperatures exceed 20 degrees C. the fish are batch spawners, laying 3-4 times a day over many days, laying 5-20 eggs a batch (total 35-333 eggs). Eggs sink and lodge on aquatic vegetation and hatch after about a week. The larvae are small (< 4 mm) and individuals begin to mature after about 12 months.

Generation Length

The generation length of Murray River Rainbowfish is projected to be 2 years. This is based on reproductive data of a closely related species, *Melanotaenia duboulayi* (Milton and Arthington 1984).

Distribution

The taxon is widespread is relatively widespread in Victoria, north of the Great Dividing Range, in the Murray River, anabranches and billabongs from the South Australian border upstream to about Torrumbarry, in the lower Loddon, Campaspe and Goulburn Rivers. It is an Indo-Pacific taxon, requiring warm waters, and is on the southern extent of its range in Victoria.

Habitat

The taxon is generally found in the lowland reaches of the Murray River and tributaries, preferring slow-flowing rivers and creeks, but also inhabiting connected wetlands and billabongs. it is found in clear and turbid waters, in the open just below the water surface, or amongst aquatic vegetation and smaller timber debris near the banks.

Threats

The Murray River Rainbowfish was probably more widespread and abundant historically before impoundment of streams and introduction of aquatic predators. It is negatively impacted by the alien species Redfin (*Perca*

fluviatilis) which can consume adults and juveniles, and juveniles can be consumed by, and adults injured and harassed, by the alien species Eastern Gambusia (*Gambusia holbrooki*). Other impacts are from the loss of aquatic vegetation (loss of important spawning and shelter habitat), and as the taxon has a poor tolerance of low water temperature, it can also be impacted by cold water releases from impoundments, or cold periods during winter. Cold waters have caused major declines in population in the Goulburn and Campaspe Rivers. Impacts from climate change are predicted to relate to a decline in river flow regimes and water volume, leading to further loss of instream habitat, and potentially an increase in suitable habitat for Eastern Gambusia.

IUCN Criteria

Criterion A. Population size reduction.
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

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

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

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

(d) actual or potential levels of exploitation

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

Evidence:

Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 449 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. This also includes data from opportunistic field sampling.

It is estimated to have four locations, as declines in abundance and habitat leading to loss of locations will be driven by more localised threats/conditions in river systems, e.g. along the Murray, and in the Loddon, Campaspe and Goulburn/Broken Rivers.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. Continuing decline in the number of mature individuals is based on the assumption that the known threats will continue to impact the taxon over the next ten years, and will intensify due to climate change impacts. There is likely to be a decline in habitat quality, loss of wetland habitat, decrease in water inflows and increasing impacts from climate change.

Criterion C. Small Population size and decline				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals				

Evidence:

Ineligible under Criterion C as Data Deficient

No reliable estimate of the total population size is available due to a lack of monitoring of this species, no abundance estimate, and possibly detection probability issues with this vagile, small species and majority of sampling within its range being undertaken using large electrofishing boats and a focus on larger native fish species.

Criterion D. Very small or restricted population			
	Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)	< 50	< 250	< 1,000
D2 Only applies to the VU 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: AoO < 20 km2 or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

There is insufficient evidence to determine the number of mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

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