



Mugilogobius platynotus Flatback Mangrove Goby

Taxonomy

Mugilogobius platynotus (Gunther, 1861)

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Mugilogobius paludis* (SAC 2005)

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(i,ii,iii,v)+2ab(i,ii,iii,v)

Species Information

Description and Life History

The size of the fish is up to 65 mm in total length (TL) and 4.0 g, usually to 50 mm TL. They are mainly carnivorous and diet changes seasonally. They have been found to consume algae, culicid larvae, other insects (e.g. dipterans), arachnids, crustacean (crab larvae and adults, copepods, amphipods and prawns), juvenile fish, algae and detritus (Morton et al. 1988, Larson 2001, Mazumder 2004, Mazumder et al. 2006).

Populations can be patchily distributed but high in abundance, and can be the dominant species in mangrove habitats in some estuaries (Mazumder et al. 2005). Abundance can vary seasonally, with high abundance recorded in mangrove and saltmarsh habitat in Botany Bay (NSW) during autumn and spring (Mazumder 2004, Mazumder et al. 2005). Abundances also vary strongly among microhabitats within mangroves (Hindell and Jenkins 2005), with more fish present within the mangrove forest than along the seaward edge or adjacent mudflat. Physico-chemical tolerances are poorly known except that the species generally has a very broad tolerance to salinity, can cope with lowered dissolved oxygen levels, and has been found in water up to 27.5o C. They have been recorded from fully marine environments (around 56 000 i/S cm) to lower reaches of freshwater streams just upstream of tidal influence at a salinity of 1 300 i/S cm (Tankerton Creek, French Island) (Raadik unpublished data). Specific salinity tolerances, particularly in relation to newly shed eggs and hatched larvae, and short and long-term exposure to differing salinity levels, is unknown. They appear to also be tolerant of low dissolved oxygen levels, with fish performing aerial surface respiration (ASR) at oxygen levels below 0.9 g/L (Gee and Gee 1991). Fish usually 'beach' themselves on the substrate just below the water surface, with the head arched upwards so that the mouth is in the surface waters, or after some time, 'hang' vertically in the water column with their mouth at the surface (Gee and Gee 1991). As dissolved oxygen levels fall, fish gulp a bubble of air and hold it in their mouths for less than a minute before exchanging it, and also increase their gill ventilation rate (Gee and Gee 1991).

Generation Length

The generation length of the Flatback Mangrove Goby is projected to be 3 years. This is based on maturity of similar sized gobies.

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Distribution

The taxon is endemic to Australia, widely distributed in tidal estuaries and marine inlets from southern Queensland (Coomera Island, Moreton Bay), through New South Wales into eastern Victoria (Morton et al. 1987, Larson 2001), including near shore islands. In Victoria, it is currently only known from Westernport, and has not been recorded from other coastal bays or inlets.

Habitat

The taxon is usually found in clear to slightly turbid shallow water areas of tidal estuarine or flowing fresh reaches of coastal rivers and creeks and marine environments in bays, inlets and coastal lagoons. It is found in close association with saltmarsh and mangroves on soft mud or sand/mud substratum, among organic debris or in tunnels of other species. In Victoria it is restricted to upper estuarine reaches close to freshwater inflow, among mangrove (*Avicennia marina*) stands (Raadik and Hindell 2008).

Threats

Loss of mangrove habitat is considered to be the main threat to this species, primarily driven by urbanisation, industrial development, pollution and sea level rise associated with climate change. In addition, water pollution (i.e. chemical spills) may also rapidly impact this taxon as its Victorian distribution is restricted to one embayment (Raadik and Hindell 2008).

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% |

| | | |
|--|---------------------------------------|---|
| <p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p> | <p>based on any of the following:</p> | <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p> |
|--|---------------------------------------|---|

Evidence:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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| 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 km ² | < 5,000 km ² | < 20,000 km ² |
| B2. Area of occupancy (AOO) | < 10 km ² | < 500 km ² | < 2,000 km ² |
| AND at least 2 of the following 3 conditions: | | | |
| (a) Severely fragmented OR Number of locations | = 1 | ≤ 5 | ≤ 10 |
| (b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals | | | |
| (c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals | | | |

Evidence:

Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 570 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have one location. All populations are in Westernport, a small coastal embayment, and can be impacted by the major threats to this taxon at the same time.

It has a continuing decline in (i), (ii), (iii) and (v) above. There is likely to be a continuing decline in habitat quality, with loss of mangrove habitat due to damage by coastal development, and from the effects of climate change. Numbers are expected to decline as a result of ongoing loss of habitat.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has 1 location, and has a continuing decline in (i), (ii), (iii) and (v) above.

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| 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

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

| Criterion D. Very small or restricted populations | | | | |
|--|--|-----------------------|------------|---|
| | | 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 km ² or number of locations ≤ 5 |

Evidence:

Eligible under criterion D2 as Vulnerable

The taxon is suspected to be very restricted.

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

References

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