Threatened Species Assessment

Limnodynastes interioris
Giant Bullfrog

Taxonomy

Limnodynastes interioris Fry, 1913

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1992).

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

Proposed conservation status

Endangered in Victoria

Criterion B2b(i,ii,iii)c(iv)

Species Information

Description and Life History

Males grow up to 90 mm and females to 88 mm (Anstis 2017). The clutch sizes average about 1000 eggs (10 clutches were between 805-1120; Anstis 2017). Tadpoles are large, to 93 mm, and take around 2.5 months to metamorphose during summer (Anstis 2017). The average length of metamorphlings is 29 mm (Anstis 2017). Growth rates, survival rates and longevity are unknown. However, inferences from related taxa (*L. tasmaniensis* living to at least 4 years of age; Foster 2001), combined with large body size and burrowing nature, suggest that this taxon may be relatively long-lived. The life history of this taxon has not been studied, nor has that of its close relatives.

Generation Length

The generation length of the Giant Bullfrog is inferred to be 4 to 10 years. The only studies on longevity of taxa of *Limnodynastes* are those for Melbourne populations of *Limnodynastes tasmaniensis*. This taxon has been demonstrated to live to 4 years of age using skeletochronology (Foster 2001). However, *L. interioris* is a much larger taxon and a burrower. As such, longevity is likely to be significantly higher.

Distribution

The taxon is recorded from a few scattered locations across northern Victoria, with the main distribution in the south-west slopes and plains of NSW.

Habitat

The taxon is associated with open woodlands and chenopod shrublands on clay rich soils. It breeds in both permanent and seasonal wetlands, with a preference for the latter.

Threats

This taxon does not have significant threatening processes driving population declines, but it may be locally impacted by processes that destroy, fragment and degrade wetland breeding habitats and non-breeding, terrestrial

habitat used for foraging. Moreover, the taxon is sensitive to climate-induced increases in drought severity, which will reduce opportunities to breed and may impact adult survival.

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 36 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

It is inferred to have a continuing decline in (i), (ii) and (iii) above. This taxon is a generalist with apparently wide environmental tolerances and capacity to adapt to agricultural modification of its habitat, as demonstrated by persistence and abundance in agricultural land across the NSW portion of its range, and capacity to reproduce in agricultural dams and irrigation infrastructure. However, longer term impacts of climate change are possible or probable, with increased drought severity and frequency reducing the availability of breeding habitat.

It is inferred to have extreme fluctuations in (iv) above. This taxon breeds in a variety of lentic water bodies, including semi-permanent and permanent wetlands. However, ephemeral wetlands and floodwaters are likely to be very high quality breeding habitat (as they are for *Limnodynastes dumerilii*), and recruitment booms could follow La Nina events. Similarly, protracted droughts could lead to crashes in survival rates and adult abundance. A ten-fold fluctuation in adult abundance is therefore plausible.

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. Population sizes of this taxon are entirely unknown and inestimable given the scale of the range, as well as their cryptic and erratic behaviour (i.e. a burrowing taxon that is largely only seen after significant rainfall).

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.

References

Anstis, M. (2017). *Tadpoles and Frogs of Australia.* Second edition. New Holland Publishers, Sydney.

DSE (2013) *Advisory List of Threatened Vertebrate Fauna in Victoria 2013*. Department of Sustainability and Environment, Melbourne

Foster, C. (2001) Costs of reproduction in frogs. BSc Hons thesis, La Trobe University.

Hunter D.A, Clemann N., Coote D., Gillespie G.R., Hollis G., Scheele B.C. Phillips A., and West M. (2018). Frog declines and associated management response in south-eastern mainland Australia and Tasmania. Chapter 6, in: *Status of Conservation and Decline of Amphibians: Australia, New Zealand and Pacific Islands*. CSIRO Publishing, Australia.

SAC (1992). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 240 *Limnodynastes interioris*