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

Conservation Advice for *Uperoleia martini* (Martin's toadlet)

In effect under the *Environment Protection and Biodiversity Conservation Act 1999* from 15 November 2023.

This document combines the approved conservation advice and listing assessment for the species. It provides a foundation for conservation actions and further planning.

Uperoleia martini (Martin's toadlet) © Copyright Matt Clancy

Conservation status

Uperoleia martini (Martin's toadlet) is listed in the Endangered category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) effective from 15 November 2023.

Uperoleia martini was assessed by the Threatened Species Scientific Committee (the Committee) to be eligible for listing under criteria 1 and 2 as Endangered. 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: A2c Endangered

Criterion 2: B2ab(i,ii,iii,v): Endangered

Criterion 3: Insufficient data

Criterion 4: Insufficient data

Criterion 5: Insufficient data

The main factors that make the species eligible for listing in the Endangered category are its suspected past severe population reduction, its restricted distribution (in five locations), and

suspected ongoing population decline due to habitat loss and degradation from ongoing land clearing and climate change, including increased frequency and severity of drought and bushfire.

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

Conventionally accepted as *Uperoleia martini* Davies & Littlejohn, 1986.

Description

The following description is drawn from Anstis (2017) and Sanders (2021). Martin's toadlet is a small, terrestrial frog from the family Myobatrachidae. Like other members of the *Uperoleia* genus, it is commonly referred to as a toadlet due to its toad-like appearance, but it is not a 'true' toad. Males have a snout-to-vent length (SVL) of up to 34 mm. Female size is unknown, but the closely related species, with similarly sized males, *U. tyleri* (Tyler's toadlet) and *U. mahonyi* (Mahony's toadlet), show little difference in body length between the sexes. Martin's toadlet has a broad head with a short, rounded snout. The eyes are golden, and the tympanum is not visible. The dorsum can be light grey-brown to dark grey with darker patches. The skin has many yellow or red-tipped tubercles (raised nodules), which sometimes form a row along the vertebrae. A ridge of yellow or white tubercles extends from the corner of the mouth, along the jaw. The upper parts of the forelimbs are yellow or red-brown, whilst the groin and back of the thighs on the long hindlimbs are yellow. The smooth underside is dark brown with white speckles, with the throat darker in males during the breeding season. The fingers are short and slightly fringed, whilst the toes are long and without fringing. Both fingers and toes have large metatarsal tubercles and no webbing between digits.

The male breeding call consists of a single, repeated, drawn-out note (Davies & Littlejohn 1986; Sanders 2021) lasting about a second, and repeated every two to three seconds.

Tadpoles grow to 41 mm total length with a body length of approximately 16 mm. The snout and body are rounded. The eyes are positioned dorsolaterally, and the iris is primarily black but may be golden around the pupil. The large nares are close together. The back is dark brown to black with gold iridophores. The underside of the body is lighter and has metallic flecks. The tail fins are moderately arched and have large black and gold spots (Anstis 2017).

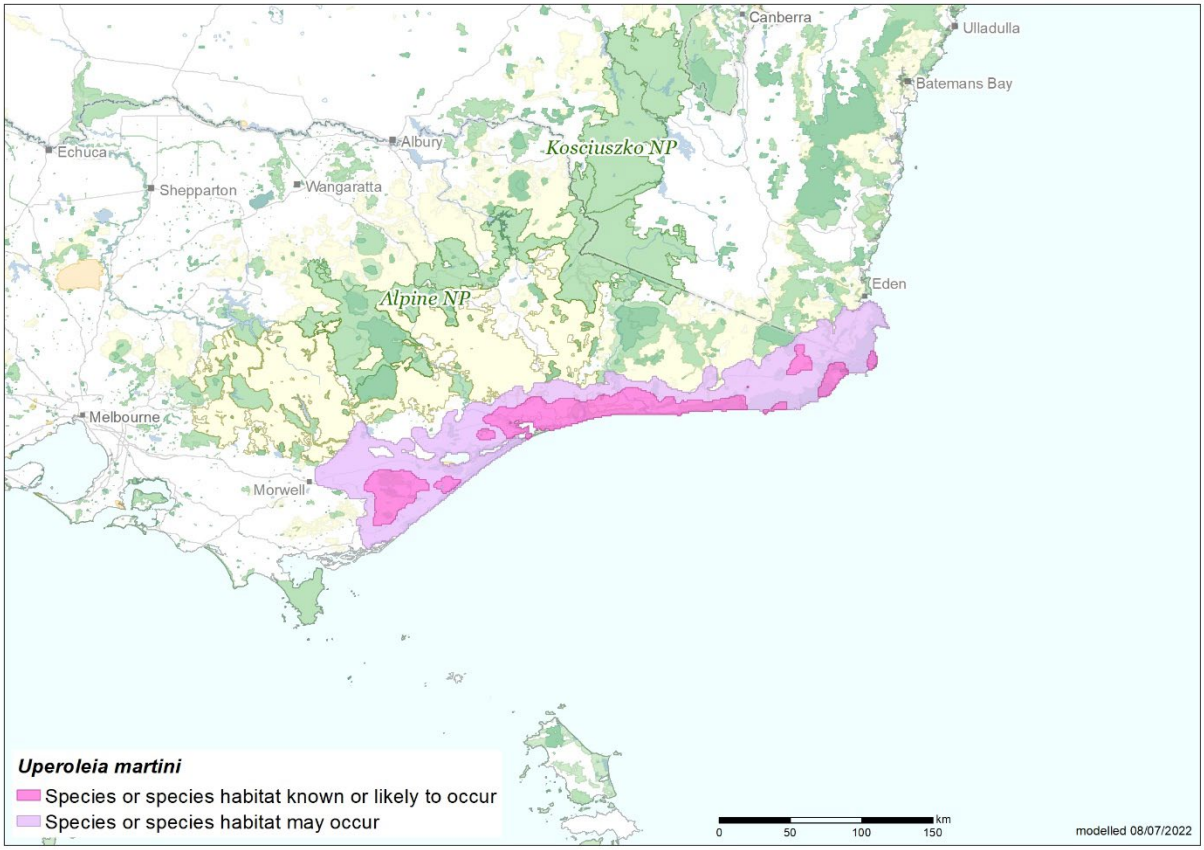
Distribution

Martin's toadlet is mostly restricted to the Gippsland coast in Victoria, with the species' distribution extending 320 km from near Yarram, Victoria to just across the Victorian/NSW border to Nadgee, NSW (Cutajar et al. 2022). Martin's toadlet has been recorded up to 36 km inland from the coast (GBIF 2021). The species' range includes sites within the Ramsar listed Gippsland Lakes and Croajingolong National Park.

Along the Gippsland coast, Martin's toadlet has a restricted distribution, and has undergone severe declines. Based on records over the past 10 years, presumed extant populations include: Holey Plains State Park, Gippsland Lakes (Dutson Downs), Cape Conran Coastal Park, the Cann

River, and Croajingolong National Park (Wingan Swamp and Howe Flat) (Collyer & Reside 2012; Rohan Bilney pers comm 2013; Tim Jessop pers comm 2013; Graeme Gillespie & Renee Catullo pers comm 2013, all cited in DELWP 2015, which was compiled by Nick Clemann).

Map 1 Modelled distribution of Martin's toadlet



Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.
Caveat: The information presented in this map has been provided by a range of groups and agencies. 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 to 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.

Frogs are known to have cultural and spiritual significance to many Indigenous Australians through their prominent role in traditional knowledge stories. Frogs feature in ceremony, lore,

mythology, totems, art, kinship, as well as being utilised as bait, food and water resources, indicators of ecological change and the overall health of Country.

Frogs are also well known by Indigenous Australians to herald impending changes in weather conditions such as relayed by changes in calling behaviour associated with drops in barometric pressures preceding significant rainfall events and floods, as noted in the anecdote, "When the Frogs Sing" (McMahon 1937). For some Indigenous Australians such as the Banbai Rangers who manage the Wattleridge Indigenous Protected Area (Banbai Nation 2021) frogs (tuk) are important ecological indicators. When tuks begin their cycle of calling and breeding it is indicative of a change in wind, temperature and humidity which is linked to an increase in the risk of fire as warmer winds bring drier and hotter conditions (McKemey & Banbai Nation 2020; McKemey et al. 2021).

Significance specific to Martin's toadlet

Frogs have many names across all the Traditional language areas where they exist. Some language names for 'frog' in areas where Martin's toadlet occur are: 'Jiddelek/ Tirtelak' in Brataualung and 'Gurgard' in Dhurga/Thurga/Walbunja. Note, these names are often onomatopoeic, illustrating the calls of species found within specific geographical areas.

The geographic range of Martin's toadlet occurs on the traditional lands of many Indigenous groups and encompasses many areas that have local Cultural Knowledge custodians and land rights holders.

Engagement

Representatives from the following groups should be contacted, seeking possible involvement in recovery/conservation actions:

- **Traditional language groups:** Brataualung, GunaiKurnai, Tatungalung, Krauatungalang, Bidawal, Bidwell, Dhurga, Thurga, Walbunja and Yuin.
- **Registered Native Title Determinations Prescribed Body Corporates:** Gunaikurnai Land and Waters Aboriginal Corporation RNTBC**.**
- **NSW Local Aboriginal Land Councils:** Eden
- **Local Indigenous Rangers, Cultural and Land Management Organisations:** Twofold Bay Corporation, Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) NRM Team and Gunaikurnai Traditional Owner Land Management Board.

Relevant biology and ecology

Habitat

Martin's toadlet primarily occurs in moderately sized permanent or semipermanent swamps and ponds surrounded by woodland or coastal scrub (DELWP 2015; Sanders 2021; R Catullo 2021 pers comm 24 September), but has also been found around dams and flooded grassland. Martin's toadlet usually stays close to water during the breeding season, but individuals are sometimes found away from free water in depressions prone to flooding (Clemann & Swan in press). The size of a waterbody is an important factor influencing the probability of occurrence, with surveys suggesting that Martin's toadlet tends to be absent from both small ephemeral pools and large bodies of water (R Catullo pers comm 2013, cited in DELWP 2015).

Around waterbodies, the species has been recorded from dry sclerophyll forest, woodlands, shrublands, grasslands, coastal heaths, sedgeland, and *Melaleuca* thickets (Cogger 2014; DELWP 2015; Sanders 2021; Clemann & Swan in press). Martin's toadlet is rarely recorded from disturbed or cleared areas, and when recorded, sites are usually adjacent to intact woodlands (M Clancy 2021 pers comm 28 October), although it has been recorded calling from paddocks some distance from intact native vegetation (N. Clemann 2023 pers comm 16 March). Land clearing has reduced the extent of the species' habitat, which is now generally restricted to protected areas and state forests (DELWP 2015).

Reproductive biology

Males begin calling in early to mid-spring (Davies & Littlejohn 1986). They are known to call from the base of emergent vegetation in flooded grasslands and densely vegetated swamps and ponds (Anstis 2017) as well as from leaf litter at the edge of waterbodies (DELWP 2015) and from paddocks (N. Clemann 2023 pers comm 16 March). Breeding events typically occur only during or after significant rain when the ground is saturated (J Tscharke 2021 pers comm 26 October).

Females lay eggs singularly and attach them to submerged grass stems or other materials (Anstis 2017). Eggs are medium-sized (ova ~2 mm in diameter) and mostly white. Clutch size is unknown.

Tadpoles hatch in approximately eight days and complete metamorphosis in late summer to autumn (Anstis 2017).

The generation length for Martin's toadlet is unknown (see Table 3 – key assessment parameters). Species longevity is uncertain but estimated to be between 5–14 years (R Catullo pers comm cited in DELWP 2015). However, survivorship may be relatively low, with individuals recorded at study sites, in the late 1970s, mostly new recruits (Humphries 1979, cited in DELWP 2021). The spread of disease (chytridiomycosis) from the 1980s onwards is likely to have further reduced survivorship (see Table 1 – threats).

Activity and habitat use

Little is known about the behaviour of Martin's toadlet. Like other *Uperoleia* species, it is inferred to have poor dispersal ability and likely burrows underground during unsuitable climatic conditions (Westgate et al. 2012; DELWP 2015). It is also thought to burrow to avoid predation (R Catullo pers comm, cited in DELWP 2015).

Tadpoles live on the bottom of ponds where they are feed on algae and detritus. They are fast swimmers and, being secretive, they are often hard to see among submerged leaf litter (Anstis 2017).

Habitat critical to the survival

Martin's toadlet is usually found close to water that is primarily surrounded by woodlands or coastal scrub (see habitat section). This species is rarely found in disturbed areas, suggesting that actions that degrade or remove habitat will reduce the area of occupancy and limit the recovery of Martin's toadlet.

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. An important population is a population that is necessary for a species' long-term survival and recovery, including key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species range (DoE 2013). Due to limited recent survey effort and genomic work, identification of separate population boundaries is difficult. However, as Martin's toadlet is listed as Endangered on the threatened species list of the EPBC Act, all populations of the species are considered important.

Threats

Martin's toadlet is primarily threatened by habitat loss and degradation. This threat takes many forms, including clearing of vegetation in breeding habitat and reduced habitat viability due to climate change, particularly increased frequency and severity of drought and associated increased frequency and severity of bushfires. Changes to habitat (including the terrestrial habitat of Martin's toadlet) that come from land clearing, logging, creation or widening of roads, and intensification of agricultural practises may hinder this species' ability to colonise new habitats, recolonise areas where it has been extirpated, or even hamper or prevent movement between key habitat components, such as aquatic breeding sites and terrestrial habitats (N Clemann 2021 pers comm 21 October).

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**
Human Disturbance (e.g., direct mortality and stress/encroachment from human activities)		
Vegetation clearance	• Timing: past/current/future • Confidence: observed • Likelihood: almost certain • Consequence: major • Trend: increasing • Extent: across part of the range	Martin's toadlet is subject to ongoing habitat loss, degradation, and fragmentation due to vegetation clearance for agriculture, timber harvesting, and the construction and maintenance of roads and utilities. The species is rare or absent in cleared habitats (DELWP 2015). Loss of habitat is likely to have the greatest impact on adult females, who generally spend more time in the surrounding vegetation, away from water bodies, than do breeding males. Given that calling males are usually used as a proxy for species presence/population size, and that *Uperoleia* species require more terrestrial habitat than previously thought (N Clemann 2023 pers comm 16 March), the importance of surrounding terrestrial habitat has often been understated. It is noted that the Victorian Government has brought forward the cessation of native timber harvesting to 1 January 2024 (VicForests 2023).
Altered hydrology	• Timing: past/current/future • Confidence: inferred • Likelihood: likely • Consequence: major • Trend: unknown	Martin's toadlet requires permanent or semi-permanent lentic (still) water bodies for breeding (Anstis 2017). If the hydrology were to change (e.g., dams diverting water, and/or substantial habitat clearing), extirpation is possible (J Tscharke 2021 pers comm 26 October).

Threat	Status[a]	Evidence
	• Extent: across part of the range	
Climate change and severe weather		
Increase in drought frequency/intensity	• Timing: past/current/future • Confidence: observed • Likelihood: likely • Consequence: major • Trend: increasing • Extent: across the entire range	Climate projections for south-eastern Australia include decreased rainfall, increased average temperatures, and more frequent droughts (Hagger et al. 2013; Pearson et al. 2014; CSIRO & BOM 2020). Martin's toadlet is dependent on water for breeding and shelter sites (DELWP 2015). Its range was reduced due to the Millennium Drought (1996-2010) and the drought preceding the 2019-20 bushfires (N Clemann 2021 pers comm 21 October). The species is unlikely to disperse across large areas of unsuitable habitat (including habitat rendered unsuitable by drought) to find more suitable habitat (N Clemann 2021 pers comm 21 October). Martin's toadlets are suspected to burrow into the ground during droughts and re-emerge when conditions improve (M Clancy 2021 pers comm 28 October).
Fire regimes that cause declines in biodiversity [b]		
Increase in fire frequency/severity	• Timing: past/current/future • Confidence: inferred • Likelihood: likely • Consequence: moderate • Trend: increasing • Extent: across the entire range	*Fire regimes that cause biodiversity decline* is included on the EPBC Act list of Key Threatening Processes (DAWE 2022) and Victoria currently lists a number of potentially threatening processes relating to fire regimes under the *Flora and Fauna Guarantee Act* 1988 (DELWP 2022). Climate projections predict an increase in the scale, frequency, and intensity of bushfires in south-eastern Australia (CSIRO & BOM 2020). In addition, the impact from planned burns has not been assessed and could be compounded by more frequent and severe bushfires. Fires can adversely affect pond and stream breeding habitat, increasing water temperature, and altering water chemistry (Lyon & O'Connor 2008), with sediment/ash runoff 'slugs' able to form in waterways following rainfall (Lyon & O'Connor 2008; Alexandra & Finlayson 2020). These slugs can fill in crevices in pond and stream substrates, reducing the availability of refugia for tadpoles (Welsh & Ollivier 1998), and promote toxic algal blooms (Alexandra & Finlayson 2020) that can deoxygenate the water and cause egg and tadpole death. Sediment slugs can persist for a significant period and reach aquatic ecosystems up to 80 km downstream of burnt areas, greatly increasing the impact on species outside of the immediate burnt area (Lyon & O'Connor 2008; Alexandra & Finlayson 2020). In the range of the Martin's toadlet, much soil and ash were present in waterbodies during recent breeding seasons since the 2019-20 bushfires, likely decreasing tadpole survival (N Clemann 2021 pers comm 21 October). The possible scale of future fire events was demonstrated by the 2019-20 bushfires, where more than 10 million hectares were burnt across southern and eastern Australia (Legge et al. 2021). An analysis by a team from the National Environmental Science Program (NESP) Threatened Species Recovery Hub showed that a large proportion of the range of Martin's toadlet was affected, with 24 % of its range burnt, 8 % in high to very high severity fire (Legge et al. 2021). The full impact of these bushfires on the species has yet to be fully determined. However, its burrowing behaviour likely helped to buffer the immediate effects. The species is known to survive fire and has been observed calling from burnt sites,

Threat	Status[a]	Evidence
		particularly if surrounded by intact habitat (M Clancy 2021 pers comm 28 October). Expert elicitation in Legge et al. (2021) suggested that recovery is plausible, with the best estimate indicating a 6 % population decline immediately following the fires and a 14 % decline 10 years post-fire (range 35 % decline to a 1 % increase; 80 % confidence interval).
Exotic invasive species, problematic native species, pathogens and disease		
Disease – animal pathogens (chytridiomycosis caused by chytrid fungus)	• Timing: past/current/future • Confidence: inferred • Likelihood: almost certain • Consequence: moderate • Trend: unknown • Extent: across the entire range	Chytridiomycosis is an infectious disease caused by the amphibian chytrid fungal pathogen *Batrachochytrium dendrobatidis* (*Bd*). Infected subpopulations exhibit diverse susceptibility to *Bd*. Some species do not show any apparent symptoms while others are extremely vulnerable, resulting in mass die-off and extinction (DOEE 2016). Mortality associated with *Bd* erodes the capacity of the population to sustain loss of recruitment associated with drought and reduces resilience to climate change (Scheele et al. 2016). *Bd* has been detected in Martin's toadlet (Speare, Mendez & Berger 2005) and may have contributed to recent species decline (DELWP 2015).
Invasive species - deer	• Timing: past/current/future • Confidence: inferred • Likelihood: almost certain • Consequence: moderate • Trend: increasing • Extent: across the entire range	Deer, including hog deer *(Axis porcinus*), sambar deer (*Rusa unicolor*), and potentially fallow deer (*Dama dama*), trample vegetation and create wallows in Martin's toadlet habitat, degrading vegetation and reducing water quality in swamps and ponds (McDowell 2007; Claridge 2016; J Tscharke 2021 pers comm 26 October).
Invasive species - feral pigs (*Sus scrofa*)	• Timing: current/future • Confidence: suspected • Likelihood: possible • Consequence: moderate • Trend: increasing • Extent: across part of its range	Feral pigs occur in the vicinity of Martin's toadlet breeding sites (Macdonald 2006; J Tscharke 2021 pers comm 26 October), with the potential to increase in abundance and further spread (DEECA 2020). Any increase could lead to incursions into Martin's toadlet habitat (J Tscharke 2021 pers comm 26 October). As feral pigs are a known threat to other frog species by both consuming them and degrading their habitat through wallowing, trampling and digging up vegetation (DELWP 2017; DoEE 2017) they would likely similarly impact the Martin's toadlet population.
Invasive species - mosquitofish (*Gambusia holbrooki*)	• Timing: current/future • Confidence: suspected • Likelihood: almost certain • Consequence: unknown/minor • Trend: unknown • Extent: across part of its range	Mosquitofish are abundant at some breeding sites of Martin's toadlet (J Tscharke 2021 pers comm 26 October). Since *Gambusia* species are a known threat to eggs and tadpoles of other frogs (NPWS 2003), it is suspected that they have a negative impact on Martin's toadlet.

[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

[b]Fire regimes that cause declines in biodiversity include the full range of fire-related ecological processes that directly or indirectly cause persistent declines in the distribution, abundance, genetic diversity or function of a species or ecological community. 'Fire regime' refers to the frequency, intensity or severity, season, and types (aerial/subterranean) of successive fire events at a point in the landscape.

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 have been developed in consultation with experts and using available literature.

Table 2 Risk Matrix

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain		**Invasive species - mosquitofish**	**Disease (chytrid);** **Invasive species - deer**	**Vegetation clearance**	
Likely			**Increase in fire frequency/severity**	**Altered hydrology;** **Increase in drought frequency/severity**	
Possible			**Invasive species - feral pigs**		
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

The current distribution of Martin's toadlet is maintained with existing habitat well managed, resulting in an increased population size.

Conservation and management priorities

Human Disturbance (e.g., direct mortality & stress/encroachment from human activity)

- Prevent disturbance to Martin's toadlet and its habitat (breeding and non-breeding). Given that Martin's toadlet uses terrestrial habitats surrounding breeding areas, determining the size and position of protection zones around occupied waterbodies is a high priority (see information and research priorities). Semlitsch & Bodie (2003) identified that terrestrial habitat should be protected at a mean minimum distance of 200 m from waterbodies where wetland frogs are recorded.
- Ensure that adequate protection measures are in place to protect the viability of populations in areas subjected to forestry or clearing of freehold land and associated management activities (this includes logging, road construction, coupe burning). Other activities that could be permitted in protection zones should be dictated by further monitoring and research into the effects of disturbance on the species (see information and research priorities).
- Ensure habitat is not further fragmented by roads, timber harvesting, or clearing of freehold land. Activities permitted in forests where the species is known or likely to occur should be informed by further monitoring and research into the effects of disturbance (see information and research priorities).
- Minimise soil compaction and reduce sediment load from entering waterways due to poor road construction and maintenance, inappropriate use of heavy machinery in the riparian zone, and soil ripping over a large area.
- Identify and conserve landscape characteristics that facilitate movement of individuals between subpopulations.
- Minimise changes to existing hydrology and maintain appropriate water quality by preventing or minimising water diversion and extraction and preventing pollution.
- Investigate whether urban development is impacting Martin's toadlet habitat close to major towns (e.g., Yarram and Bairnsdale). Minimise loss or change to suitable Martin's toadlet habitat as a precautionary approach.
- Encourage landholders to enter land management agreements, particularly in-perpetuity covenants, which promote the protection and maintenance of key areas within the species' distribution.

Climate change and severe weather

- Investigate options for enhancing the resilience of the species' habitat to extreme interannual variation in rainfall, and especially to drought.
- Model the impact of climate change on species' survival under projected climate scenarios, in particular:
  - Identify the impact of more frequent droughts and bushfires on subpopulations.
  - Identify which regions within the species' distribution are most/least vulnerable to increasing temperatures.
- Identify climatic refuges within the habitat range of the species to ensure effective ongoing management and protection of this habitat.
- Protect and maintain enough high-quality habitat (as identified in the habitat section) to ensure the species' viability.

Fire regimes that cause biodiversity decline

- Monitor recovery of populations impacted by the 2019-20 bushfires, including on-ground surveys during optimal survey conditions (see survey and monitoring priorities) to establish population responses to the 2019-20 bushfires and to provide a baseline for ongoing monitoring.
- Assess the effects of fire on survival and reproduction, including:
  - The impact of altered environmental attributes (e.g., loss of canopy in surrounding woodland, or ash and sediment 'slugs' in waterbodies).
  - The species' long-term response to frequent and/or severe bushfires, through identifying possible changes in distribution, i.e., those parts of its range that are most susceptible, or conversely, where there are opportunities to enhance refuges from fire.
- Develop and implement fire management plans and actions within (or affecting areas within) the distribution, including actions to:
  - Identify and map suitable habitat and climate refuge areas.
  - Improve habitat condition and minimise the risk of high severity bushfires.
  - Avoid damage to identified habitat, including climate refuge areas, during fire management operations.
  - Implement immediate and ongoing invasive species control in burnt habitat at a scale and intensity that effectively mitigates current and projected impacts from invasive species.
  - Protect unburnt areas within or adjacent to recently burnt areas from further fire, to provide refuge sites, as well as the broader surrounding unburnt areas.
  - Include an adaptive management approach to adjust management actions as new information comes to light about the resilience or susceptibility of the species to fire and interacting threats.

Exotic invasive species, problematic native species, pathogens and disease

- Monitor and control deer populations to levels where their impact on Martin's Toadlet habitat is negligible, within and surrounding Martin's toadlet breeding sites, including erecting exclusion fences, where feasible (see Bennett & Coulson 2008).

- Monitor and control feral pig populations to levels where their impact on Martin's Toadlet habitat is negligible in the areas adjacent to Martin's toadlet breeding sites.
- Reduce or eliminate mosquitofish from Martin's toadlet breeding sites.
- After receiving guidance from the most appropriate species experts, remove weeds and conduct habitat restoration works to support the regeneration of dry sclerophyll forest, woodlands, shrublands, grasslands and coastal heath surrounding breeding sites. Note: weed removal should be undertaken by hand pulling or cutting and pasting/painting methods as herbicide formulations can be toxic to frogs and tadpoles, particularly if they contain glyphosate or surfactants (Mann et al. 2003).

Stakeholder engagement/community engagement

- Engage custodians of Indigenous Cultural Knowledge and Traditional Custodians in management, including the implementation of cultural fire management practices and survey, research, monitoring and management actions. Enable the sharing of knowledge, while ensuring the processes and protocols to record, store, and share any knowledge are agreed and appropriately resourced. Information on the application of Indigenous burning and integrated Caring for Country practices to protect and enhance habitat is of critical importance.
- Ensure information on Martin's toadlets and their habitat is shared between state forest managers and environment staff in the Victorian, NSW, and Commonwealth governments. New population data and research should be made available to all stakeholders to continue to implement best-practice land management that minimises the impacts of potential threats on the species.
- Provide input into the various impact assessment and planning processes on measures to protect Martin's toadlets and its habitat. These include water resource plans, park management plans, logging plans, planned burning, and environmental impact assessments.
- Where research identifies potential habitat for the species in areas that are privately-owned, liaise with landholders to encourage conservation covenanting and provide information on the species and its habitat requirements, and encourage reporting of any sightings.
- Educate landowners and managers on the importance of maintaining riparian and lentic habitat, including surrounding terrestrial habitat, and the integration of habitat protection into land management regulations.
- Investigate the feasibility of establishing a recovery team, consisting of relevant experts, to guide the recovery of this species.

Survey and monitoring priorities

- Support current ongoing surveys in Victoria, and extend this work to the NSW range of this species to determine the current distribution.
- Establish a monitoring program to detect any change in population size, determine ecological requirements (breeding and non-breeding), and to understand how different subpopulations are responding to various threats, particularly disease, logging, fires, and droughts, across the range of its environmental and management settings.

- Assess the feasibility of using eDNA for detection and/or persistence surveys.

Information and research priorities

- Work with Traditional Custodians to share any Indigenous Cultural Knowledge associated with the species, ensuring the practices to record, store and disseminate this knowledge are mutually supported.
- Identify the species' breeding and non-breeding habitat requirements, including landscape and habitat characteristics that facilitate movement of individuals, and evaluate factors influencing the quality and availability of suitable habitat across its distribution.
- Identify and map key sites.
- Identify all potential threatening processes that may have affected the species' distribution and abundance, then evaluate their relative contribution to the decline and the impediment to recovery. In particular:
  - Assess the impact of disturbance, and determine the best method to designate protection zones, including the size and placement of zones, and activities permitted within zones.
  - Assess the effects of fire on survival and reproduction, as identified in the 2019-20 bushfire response section.
  - Identify an optimal fire regime by assessing population-level responses to a range of fire regimes and modelling population viability across all fire scenarios.
  - Understand the influence of climate change on the long-term survival prospects of the species, due to altered temperatures, rainfall patterns, increasing bushfire frequency and severity and increasing disease susceptibility, through maintaining robust population and environmental monitoring.
- Conduct ecophysiology studies to determine physical tolerances to better understand the threat posed by climate change.
- Support the current work that seeks to understand the impact on frog populations of fire retardants used to fight bushfires.
- Monitor hydroperiods of ephemeral waterbodies used by Martin's toadlet for breeding to determine the impact from drought and altered hydrology.
- Improve understanding of the extent and impact of infection by *Bd* to better inform how to apply existing or new management actions relevant to species' recovery. If *Bd* is found to be a threat:
  - Within long-term survey and monitoring programs, investigate the availability of *Bd* refuge sites, either within or outside of the natural known range of the species.
  - Minimise the spread of *Bd* through implementing suitable hygiene protocols (Murray et al. 2011) to protect priority populations as described in the *Threat abatement plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis* (DoEE 2016) and provide disease identification and prevention protocols and training (methods of handling, diagnostic keys, etc.) to researchers and land managers for use in the field.

- If a recovery team is formed (see stakeholder/community engagement section), provide support so that the team can inform land management decisions that affect Martin's Toadlet, such as:
  - If and where forest should be regenerated.
  - The best method to designate protection zones, including size, placement, and activities permitted within zones.
  - Determination and implementation of sound fire regimes, in consultation with Traditional Owners.
  - The most beneficial places in which to have land management agreements with landholders.

Recovery Plan decision

As an approved, updated, and detailed Conservation Advice for the species would provide sufficient direction to implement priority conservation actions, mitigate key threats, enable recovery and provide foundation for further planning, a national Recovery Plan is not required at this time.

Consequently, the Threatened Species Scientific Committee has not recommended that a recovery plan be required (see Attachment A for TSSC recommendations regarding the need for a recovery plan).

Links to relevant implementation documents

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The Threatened Species Scientific Committee finalised this assessment on 3 April 2023.

Attachment A: Listing Assessment for *Uperoleia martini*

Reason for assessment

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

As part of the Australian Government's bushfire response the Department engaged scientific experts to deliver a number of Species Expert Assessment Plans (SEAPs) for groups of fire-affected and non-fire affected species and ECs, 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 Martin's toadlet 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	Insufficient data			There are insufficient data to estimate the number of mature individuals.
Trend	Declining			The population is suspected to be declining due to ongoing threats (see Table 1). After the 2019-20 bushfires, the population is projected to decline by 14 % by 3 generations after the fires (80% confidence limits: 35% decrease to 1 % increase) (Legge et al. 2021). This estimate does not include the possible impact of further drought or bushfires.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Generation time (years)	4.25	3	5.5	Limited data are available to calculate the generation time for Martin's toadlet, with longevity uncertain, but estimated to be between 5–14 years (R Catullo pers comm cited in DELWP 2015), and survivorship and relative fecundity at different ages unknown. However, Humphries (1979), cited in DELWP (2021), suggested a high proportion of Martin's toadlets entering a study site each year were new recruits (67 % on average), from which a relatively low survival rate was inferred. Given the age at first reproduction is estimated at 2 years (DAWE 2021), the length of the reproductive period is estimated to be between 3–12 years. Given such limited data, the generation time is calculated using the simple IUCN (2022) formula for generation length: age of first reproduction + [z * (length of the reproductive period)], where z is the fraction of adult life span that passes before the average individual has contributed half of its lifetime, age-weighted reproduction. Given the inferred low survival rate, the z-value is estimated to be a maximum of 0.3, with the IUCN guidelines stating the z-value for species is usually < 0.5 (IUCN 2022). The calculated plausible generation time range is between 3–5.5 years, with the estimate used in the assessment the mid-point of 4.25 years. This generation time is consistent with the range (2–6 years) in the assessment on the Martin's toadlet recently conducted by DELWP (2021).
Extent of occurrence (EOO) (km^2)	11,656			The EOO estimate is based on the mapping of confirmed point records, obtained from state governments, museums, and citizen science projects, including FrogID (Rowley et al. 2019; Rowley and Callaghan 2020; GBIF 2021; Cutajar et al. 2022). All records were vetted by experts, and only records considered to represent the current distribution of the species were used for this assessment. The EOO was calculated using a minimum convex hull based on the IUCN Red List Guidelines (2022).
Trend	Contracting			EOO is suspected to be contracting due to habitat loss from vegetation clearing, drought, and bushfires (DELWP 2015; Legge et al. 2021; R Catullo 2021 pers comm 24 September; N Clemann 2021 pers comm 21October).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Area of Occupancy (AOO) (km²)	240	180	360	The AOO estimate is based on the mapping of confirmed point records, obtained from state governments, museums, and citizen science projects, including FrogID. All records were vetted by experts, and only records considered to represent the current distribution of the species were used for this assessment. The AOO was calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines (2022). Whilst the AOO was calculated to be 180 km² based on existing records, it is likely an underestimate due to lack of sampling within the EOO. It is considered unlikely that the true AOO exceeds twice the calculated AOO, and therefore the maximum plausible value is estimated to be 360 km², which is below the threshold for Endangered listing (< 500 km²). The estimate used in this assessment is 240 km², which is halfway between the minimum and maximum plausible values.
Trend	Contracting			AOO is suspected to be contracting due to habitat loss from vegetation clearing, drought, and bushfires (DELWP 2015; Legge et al. 2021; R Catullo 2021 pers comm 24 September; N Clemann 2021 pers comm 21 October).
Number of subpopulations	Insufficient data			There are insufficient data to assess the number of subpopulations. More surveys are needed to determine the extent of population connectivity. Based on records over the past 10 years, there are at least 6 areas with presumed extant populations, which include: Holey Plains State Park, Gippsland Lakes (Dutson Downs), Cape Conran Coastal Park, the Cann River, and Croajingolong National Park (Wingan Swamp and Howe Flat) (Collyer & Reside 2012; Rohan Bilney pers comm 2013; Tim Jessop pers comm 2013; Graeme Gillespie & Renee Catullo pers comm 2013, all cited in DELWP 2015). Whether these represent discrete subpopulations or whether additional subpopulations occur within or between these areas is unknown.
Trend	Insufficient data			Insufficient data.
Basis of assessment of subpopulation number	Number of subpopulations is unknown.			

No. locations	5	1	5	The maximum plausible number of locations (and the estimate used in the assessment) is 5. This is based on the disjunct nature of the Martin's toadlet distribution, with isolated pockets of known abundance being situated across different landscapes and varying in susceptibility to threats. The Martin's toadlet distribution is spread over 2 coastal bioregions with different land use histories, the largely protected South East Corner IBRA Bioregion (SEC) (straddling the bottom corner of the Victorian/NSW border) and the intensively modified South East Coastal Plain IBRA Bioregion (SCP) (entirely within Victoria) (see Map 2). The SEC is heavily forested, with 28 % of the Victorian section and 43 % of the NSW section of the bioregion in protected areas (public and private) (Thackway & Cresswell 1995; DP&E 2003; Trust for Nature 2013; BAP 2018). Given the heavily forested nature of the SEC, the most serious plausible threat to Martin's toadlet in the bioregion is high severity fire. Although a large-scale fire could impact a sizeable portion of the population in the SEC, fires are patchy in nature and high severity fire in a single fire season is unlikely to occur at, or impact, all Martin's toadlet sites. Therefore, separate sites in the SEC (Cape Conran Coastal Park, the Cann River, and Wingan Swamp and Howe Flat in the Croajingolong National Park) are considered individual locations. In contrast to the heavily forested SEC, the SCP is mostly cleared of native grassland and eucalyptus forests for agriculture and forestry (Thackway & Cresswell 1995; BAP 2018). Approximately 10 % of the bioregion is in protected areas (public and private) (Trust for Nature 2013). Within this degraded landscape, the most serious plausible threat to Martin's toadlet is drought. Martin's toadlet primarily occurs in moderately sized permanent or semi-permanent swamps and ponds, with surveys suggesting that the species tends to be absent from small ephemeral pools (see habitat section). This habitat is restricted in availability, with less than 3 % of the Gippsland Basin (which includes all the SCP, part of the SEC to the east, and part of the South Eastern Highlands bioregion to the north-east) classified as water (BAP 2018), and therefore potential Martin's toadlet habitat. Competing water requirements from agriculture, plantation forestry, and urban areas in the Gippsland Basin (which account for over 70 % of land use; BAP 2018) exacerbate drought conditions, and it is plausible that a high severity drought could drastically reduce Martin's toadlet habitat in this bioregion. Therefore, the entire Martin's toadlet population in the SCP is considered one location. A minimum plausible value of 1 location is based on the restricted distribution of the species, being largely limited to the East Gippsland coast. It is plausible that a very severe drought could impact all sites, drastically reduce Martin's toadlet habitat, and rapidly affect all individuals of the taxon.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Unknown			
Basis of assessment of location number	Different land use across the Martin's toadlet distribution, where roughly half the distribution has been heavily cleared for agriculture, forestry and urban use (SCP), and half largely retained native habitat and forests (SEC), means threat risk varies across the distribution (with differing consequences and likelihood of occurring). Forested areas are most plausibly threatened by high severity fire, whilst cleared areas with high urban/agricultural water requirements are most plausibly threatened by drought. Although a large-scale fire could impact a large portion of the heavily forested distribution, fires are patchy in nature and high severity fire in a single fire season is unlikely to occur at or impact all Martin's toadlet sites in the SEC.			
Severely fragmented	The Martin's toadlet population is fragmented, with isolated pockets of known abundance being situated across different landscapes. However, the population does not meet the IUCN criteria for 'severely fragmented', which requires more than 50% of individuals be found in isolated subpopulations smaller than would be required to support a viable population (IUCN Standards and Petitions Committee 2022).			
Fluctuations	Martin's toadlet is not 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 A2c for listing as Endangered

The generation length of Martin's toadlet is estimated to be 4.25 years (see Table 3 – key assessment parameters). Therefore, population reductions were assessed over a three-generation length period of approximately 13 years (plausible range of 10–16.5 years). This generation length should be updated as ecological and biological knowledge on the species improves.

Martin's toadlet is challenging to detect under less-than-ideal conditions (i.e., during or after heavy rain, saturated soil), making monitoring difficult (J Tscharke 2021 pers comm 26 October). However, the species is inferred to be declining based on habitat loss and degradation from habitat clearance (forestry and agriculture) and invasive species, and climate change (including an increase in severity and frequency of drought and bushfire) (see Table 1 - threats).

During the summer of 2017-18, surveys recorded Martin's toadlet at just 2 of 30 sites in presumed suitable habitat, with other frog species calling at 24 of these 30 sites (J Sumner 2022 pers comm 27 January). However, these surveys were conducted under drought conditions, which are less likely to promote calling by males (Hunter et al. 2018; Tscharke 2021 pers comm 26 October). When targeted surveys were conducted in 2021, during optimal wet conditions, Martin's toadlet was regularly observed at previously occupied sites across its range (Clancy 2021 pers comm 28 October).

Analysis of the Victorian population of Martin's toadlet over the past 15 years (2006-21) concluded that the population was suspected to have declined by 50–85 % due to drought conditions, with breeding ponds drying up, and habitat loss from the 2019-20 bushfires (expert opinion cited in DELWP 2021). This analysis also suspected the Victorian population would continue to decline over the next three generations (2022-35) by 40–70 % due to an increased frequency and severity of these threats induced by climate change.

An analysis based on the impact of the 2019-20 bushfires (not including drought) by the National Environmental Science Program (NESP) Threatened Species Recovery Hub, estimated that 24 % of the range of Martin's toadlet was affected by the bushfires: 8 % was burnt in high to very high severity fire, and a further 16 % was burnt in low to moderate severity fire (Legge et al. 2021). A structured expert elicitation process was used to estimate the proportional population change for this species from pre-fire levels to immediately after the fire and then out to three generations after the fire, when exposed to fires of varying severity. These results, combined with the spatial analyses of fire overlap, suggest that one year after the fire, the species experienced an overall decline of 8 % from pre-fire levels, but could be within the range of 18–20 % (bound of 80 % confidence limit). After three generations, the estimate for the overall population decline relative to the pre-fire population was predicted to be 14 % but could be within the range of a 35 % decline to 1 % increase in size (bound of 80 % confidence limit). However, the estimates for future population size did not consider the impact of drought and assumed no further fire events, and thus were conservative.

Considering both assessments (DELWP 2021 and Legge et al. 2021), the past decline over three generations in the Martin's toadlet population is assessed to be > 50 %, meeting the threshold for Endangered. Future declines lie in the range 14–70 %, but with much uncertainty. Following a precautionary approach, the future decline is assessed to be > 30 %, meeting the threshold for Vulnerable listing.

The Committee considers that Martin's toadlet has undergone a severe reduction in numbers over three generations (13 years; from 2010-23), which is equivalent to at least 50 % and the reduction has not ceased, the cause has not ceased and may not be reversible. Therefore, the species has met the relevant elements of Criterion 1 to make it eligible for listing as 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 B2ab(i,ii,iii,v) for listing as Endangered

The extent of occurrence (EOO) of Martin's toadlet is calculated at 11,656 km² and the area of occupancy (AOO) is calculated at 240 km² (see Table 3 – key assessment parameters). The EOO meets the threshold for listing as Vulnerable under subcriterion B1 and the AOO meets the threshold for listing as Endangered under subcriterion B2.

The number of locations is estimated to be five (see Table 3 – key assessment parameters). Roughly half the Martin's toadlet distribution is within heavily cleared habitat and half is retained within native habitat and forests (see Map 2 below). Subsequently, threat risk varies across the distribution (with differing consequences and likelihood of occurring). Cleared areas (yellow-green area, Map 2) with high urban/agricultural water requirements are most plausibly threatened by drought, whilst forested areas (purple area, Map 2) are most plausibly threatened by high severity fire. Although a large-scale fire could impact a large portion of the heavily forested distribution, fires are patchy in nature and high severity fire in a single fire season is unlikely to occur at, or impact all, Martin's toadlet sites. Therefore, separate Martin's toadlet sites are considered individual locations in forested areas.

Map 2 Historic distribution of Martin's toadlet across two coastal bioregions

Map shows: historic distribution of Martin's toadlet from GBIF (2021). The blue line represents species distribution derived from the Frog Atlas (distribution mapped from the FrogID dataset; Cutajar et al. 2022), the yellow-green area represents the South East Coastal Plain IBRA Bioregion, the purple area represents the South East Corner IBRA Bioregion.

Continuing declines in the EOO, AOO, extent and quality of habitat, and number of mature adults are inferred based on ongoing threats to Martin's toadlet, particularly habitat degradation, fire, and climate change (see Table 1 and Criterion 1), thereby meeting the threshold for listing as Endangered under subcriterion (b)(i,ii,iii,v).

The Committee considers that Martin's toadlet's geographic distribution is restricted, the number of locations is restricted, and continuing decline is inferred in extent of occurrence, area of occupancy, extent and quality of habitat, and number of mature individuals. Therefore, Martin's toadlet has met the relevant elements of Criterion 2 to make it eligible for listing as Endangered.

Criterion 3 Population size and decline

		Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals		**< 250**	**< 2,500**	**< 10,000**
AND either (C1) or (C2) is true				
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)		**Very high rate 25% in 3 years or 1 generation (whichever is longer)**	**High rate 20% in 5 years or 2 generation (whichever is longer)**	**Substantial rate 10% in 10 years or 3 generations (whichever is longer)**
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:				
(a)	(i) Number of mature individuals in each subpopulation	**≤ 50**	**≤ 250**	**≤ 1,000**
	(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 is no estimate for the number of mature individuals.

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 km² 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.

There is no estimate for the number of mature individuals.

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

The distribution of Martin's toadlet is restricted and occurs at five locations (see Table 3 – key assessment parameters), meeting the threshold for Vulnerable listing under D2. However, further surveys are required to quantify parameters such as the size of the population and number of subpopulations to determine whether the species could be driven to Critically Endangered or Extinct in a very short time (1 or 2 generations). Therefore, the Committee considers that there is insufficient information to determine the eligibility of the species for listing under criterion D2.

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

Quantitative analysis of extinction risk 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 was made available for public comment for 31 business days between 11 November 2022 and 23 December 2022. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process and provided to the Minister for the Environment with the Committee's advice.

Listing and Recovery Plan Recommendations

The Threatened Species Scientific Committee recommends:

i) that the list referred to in section 178 of the EPBC Act be amended by **including** *Uperoleia martini* in the list in the Endangered category.

ii) that there not be a Recovery Plan for this species in accordance with the provisions of the EPBC Act and the Committee's conservation planning principles as follows:

- An approved Conservation Advice is an effective, efficient and responsive document to guide the implementation of priority management actions, mitigate key threats, and support the recovery for this EPBC Act listed Endangered species.
- An approved Conservation Advice would support the species recovery by identifying priority actions, stakeholders for engagement, and the survey and research priorities to facilitate a better understanding of key threats as well as biological and ecological knowledge gaps.
- The threats facing the species and the recovery actions needed are well-understood and can be effectively guided by a Conservation Advice.

- Coordination of conservation actions is restricted to a few key stakeholders, with the Martin's toadlet population distributed along the Gippsland coast in Victoria (including the Ramsar listed Gippsland Lakes and Croajingolong National Park) and the southernmost corner of NSW.

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

Cataloguing data

This publication (and any material sourced from it) should be attributed as: Department of Climate Change, Energy, the Environment and Water 2023, Conservation Advice for *Uperoleia martini* (Martin's toadlet), Canberra.

This publication is available at the SPRAT profile for *Uperoleia martini* (Martin's toadlet).

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