



## Consultation Document on Listing Eligibility and Conservation Actions

### *Phyloria frosti* (Baw Baw frog)

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

- 1) the eligibility of *Phyloria frosti* (Baw Baw frog) for inclusion on the EPBC Act threatened species list in the Critically Endangered category; and
- 2) the necessary conservation actions for the above species.

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

Anyone may nominate a native species, ecological community or threatening process for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Responses are to be provided in writing either by email to:  
[species.consultation@environment.gov.au](mailto:species.consultation@environment.gov.au)

or by mail to:

The Director  
Marine and Freshwater Species Conservation Section  
Wildlife, Heritage and Marine Division  
Department of the Environment  
PO Box 787  
Canberra ACT 2601

**Responses are required to be submitted by 2 March 2018.**

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## **General background information about listing threatened species**

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

<http://www.environment.gov.au/biodiversity/threatened/index.html>.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at:

<http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf>.

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

<http://www.environment.gov.au/biodiversity/threatened/nominations.html>.

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

<http://www.environment.gov.au/biodiversity/threatened/recovery.html>.

## **Information about this consultation process**

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

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

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

## **Privacy notice**

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

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

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

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

# *Philoria frosti*

(Baw Baw frog)

## **Taxonomy**

Conventionally accepted as *Philoria frosti* (Spencer, 1901)

## **Species Information**

### **Description**

The Baw Baw frog is a medium sized frog, females grow to about 52 mm snout-vent length (SVL) and males about 45 mm SVL (Littlejohn 1963). The dorsal surface of adults is predominantly brown to dark brown with cream–yellow flecks or spots, and/or larger patches spreading from the top of the head and snout to the back. A characteristic brown-black lobe shaped parotoid gland occurs behind each eye, extending back over each shoulder. The skin is covered with small tubercles or warts, particularly on the sides and rump. The ventral surface is smooth and cream to yellow, heavily pigmented with brown flecking. The tympanum is hidden and fingers and toes are unwebbed. As well as the difference in maximum size, the sexes can be distinguished by other external features. Males have a dark brown-black throat, longer legs and wider heads, while females possess a flanged inner first and second finger. Following metamorphosis, juvenile frogs are cream to brown with dark brown irregular flecks and patches, and a distinct dark-brown band occurs from the snout through the eye to the base of the forelimb.

The call is a short “clunk” repeated in sequences of up to 30 calls (Littlejohn 1963). Egg masses are deposited in a transparent foam nest about 8 cm diameter and 4 cm high (Littlejohn 1963) at the calling site, or nearby, during inguinal amplexus. Larvae have a rounded body and tail about twice body length and are creamish-white and unpigmented at hatching, with pigment increasing during development (for more detailed descriptions of adults (Littlejohn 1963; Barker et al. 1995; Cogger 2014).

### **Distribution**

The Baw Baw Frog is restricted entirely to the Baw Baw Plateau and escarpment area, located in the Central Highlands of Victoria, approximately 120 km east of Melbourne, in the IBRA Australian Alps bioregion. The species has an extent of occurrence of about 135 km<sup>2</sup>, encompassing sub-alpine habitats (1260–1560 m) and montane habitats down to 960 m elevation on the south-western escarpment of the Baw Baw Plateau, and 1200 m elevation on the north-eastern escarpment (Hollis 2004). This area includes 75 km<sup>2</sup> within the Baw Baw National Park, 3 km<sup>2</sup> within the Mt Baw Baw Alpine Resort, and 56 km<sup>2</sup> within State Forest.

The distribution of the extant population is now approximately 50 km<sup>2</sup>. In 1996, a lower-elevation population was recorded on the south-west escarpment of the Baw Baw Plateau at 960 m to add to the known sub-alpine population above 1300 m. Records as low as 940 m have now been recorded, with a one-off unconfirmed record at 820 m. The initial contraction in distribution range from sub-alpine elevations above 1300 m occurred sometime in the mid 1980s after the baseline survey of Malone (1985b). Declines have continued to occur at elevations below 1300 m since 1996, but have accelerated since 2005 (Hollis personal communication). Recent survey data (2014 - 2016) indicates that further substantial declines have occurred (Baw Baw frog recovery team personal communication).

### **Relevant Biology/Ecology**

Male Baw Baw Frogs call from September to March, with a peak in calling activity and egg laying in October and November (Malone 1985b, a; Hollis 1995, 2004). Egg masses are deposited in a transparent foam nest about 8 cm diameter and 4 cm high (Littlejohn 1963) at the calling site, or nearby, during inguinal amplexus. The foam nest is produced by the female beating air bubbles into the mucous and eggs with her flanged fingers during egg laying (Littlejohn 1963). The egg mass may be deposited at varying depths in vegetation, or below the ground surface to a metre or more in depth, depending on the structural attributes of the site (G. Hollis pers. obs. in Hollis 2004).

Clutch sizes range from 50–185 eggs (Littlejohn 1963; Malone 1985 a, b). Eggs are white, unpigmented and about 4 mm in diameter (Malone 1985a). Oviposition of more than one clutch may occur at a single site (Malone 1985a), and it is also possible that females deposit a portion of their eggs at more than one site (Malone 1985b). Eggs are deposited in natural cavities formed from vegetation, logs, rocks and soil that act as catchments for water (Littlejohn 1963; Malone 1985b; Hollis 2004). Eggs hatch in 5–8 weeks and larvae do not feed, hatching with a residual yolk mass that sustains them through to metamorphosis (Malone 1985a, b).

Larval development occurs at the oviposition site which, while wet, usually has very little free water, although larvae retain the ability to swim (Malone 1985b, a). The larval period ranges from 5–10 weeks, with individuals metamorphosing at about 7 mm snout-vent length (Malone 1985a, b).

The maximum age recorded is about 15 years, with males reaching sexual maturity at 3.5 years and females at 4.5–5.5 years (Hollis 2004). Generation time is estimated to be approximately 8–10 years.

The duration of the breeding season appears closely linked with temperature and rainfall. Longer breeding seasons were positively correlated with greater total rainfall and negatively correlated with increasing average temperature (Hollis 2004). Commencement of the breeding season appears to coincide with the arrival of warmer spring temperatures, although completion occurs with daily ambient and substratum temperatures increasing by 2.8°C and 0.4°C respectively (Hollis 2004).

Adult Baw Baw Frogs are relatively sedentary over breeding and post-breeding season periods. During the breeding season, most males remain at breeding sites for the duration of calling activity. Towards the end of the breeding season, males disperse into drier habitats adjacent to the breeding sites, with linear movements up 82 m occurring. Female frogs entered breeding sites during the peak of male calling activity to lay eggs (2–3 weeks), then returned into adjacent drier habitats following the breeding season (Hollis 2004). Adult frogs move about when conditions are wet, with movement limited by increased temperature and reduced humidity (Hollis 2004). Virtually nothing is known about the movements of juveniles and sub-adults, although recently metamorphosed frogs probably remain in close proximity to breeding sites (M. Littlejohn pers. comm.; G. Hollis pers. obs. in (Hollis 2011)) and sub-adults may potentially be more mobile.

## Threats

While a range of threats to the Baw Baw frog have been identified, the cause of the decline, which began in the early 1980s is unclear. Below are listed the range of threats that may have contributed, drawn from the national recovery plan (Hollis 2011).

The table below lists the threats impacting the species in approximate order of severity of risk, based on available evidence.

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Disease - Chytrid fungus	Severe	Whole of range	Chytridiomycosis is an infectious disease caused by the

			<p>amphibian chytrid fungus (<i>Batrachochytrium dendrobatidis</i>) that affects amphibians worldwide, causing mass die-offs and some species extinctions (Department of the Environment and Energy 2016).</p> <p>It has not been determined whether chytrid caused the initial observed decline of this species (in the 1980s) as that event occurred prior to the notable decline of other species in the 1990s, attributed to the chytrid disease epidemic. Nevertheless, chytrid has been detected in some tissue samples of Baw Baw frogs (Hollis 2011) and researchers have implicated the disease in this species decline (Skerratt et al. 2016).</p> <p>The sympatric species <i>Crinia signifera</i> (common eastern froglet) has been identified as a potential reservoir host for chytrid (Hunter et al. 2008). Activity that may increase the distribution or density of the common eastern froglet into areas occupied by the Baw Baw frog should be considered a potentially threatening process (Hunter et al. 2008).</p>
Habitat loss and degradation (e.g. clearing, trampling, fragmentation, altered hydrology, salinity)	Moderate	Most of range	<p>Sambar deer and feral cattle occur on the Baw Baw Plateau, where their grazing and browsing on native vegetation and trampling and use of breeding habitat as wallows is a potential threat (Hollis 2011).</p> <p>Forestry activities were considered a potential threat to the species through destruction of habitat and altered stream hydrology but the areas of habitat has now been protected in permanent reserves.</p>
Climate change (temperature increase, extreme weather events e.g. cyclones, droughts)	Severe	Most of range	<p>The impact of climate change is particularly relevant to the Baw Baw frog, given that it is confined to sub-alpine and montane habitats in a very limited area. The confinement of most of the Baw Baw frog population to the south-western</p>

			escarpment of the Baw Baw Plateau, which is wetter and cooler than other areas within the distribution of the species (Hollis 2004), supports the hypothesis that a warming and drying climate may be a major factor in the population decline and distribution shift observed in the species (Hollis 2011).
Inappropriate fire regimes	Moderate	Most of range	Bushfires on the Baw Baw Plateau are uncommon due to its wet climate, but may pose a threat to the Baw Baw frog in particular circumstances. The Baw Baw Plateau, or parts of it, have been burnt on a number of occasions previously, most recently in 1939. The plateau has been free of serious fires for the past 64 years.
Invasive species	Moderate	Most of range	<p>Due to their invasive nature, exotic flora that may be of threat to the frog include grey willow (<i>Salix cinerea</i>), blackberry (<i>Rubus sp.</i>) and balbosus rush (<i>Juncus balbosus</i>). Incursions of weeds through forestry activities remains as a potential threat to the habitat of the Baw Baw frog (Hollis 2011).</p> <p>Little is known about predation on the Baw Baw frog but feral predators (such as cats and foxes) may present a threat to adults (Hollis 2011).</p>

### Assessment of available information in relation to the EPBC Act Criteria and Regulations

<b>Criterion 1. Population size reduction (reduction in total numbers)</b> Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	<b>Critically Endangered Very severe reduction</b>	<b>Endangered Severe reduction</b>	<b>Vulnerable Substantial reduction</b>
<b>A1</b>	≥ 90%	≥ 70%	≥ 50%
<b>A2, A3, A4</b>	≥ 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.	(a)	direct observation [ <i>except A3</i> ]
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.	(b)	an index of abundance appropriate to the taxon
A3	Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) <i>cannot be used for A3</i> ]	(c)	a decline in area of occupancy, extent of occurrence and/or quality of habitat
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.	(d)	actual or potential levels of exploitation
		(e)	the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

*based on any of the following*

## Evidence:

The generation length for this species is eight to ten years (Hollis 2004), therefore the relevant time span for this criterion is 24-30 years, extending to approximately 1987.

The number of calling males at >1400 m elevation declined from approximately 750 to fewer than 15 in the years 1993-2002 (Hollis 2011). From 2006 to 2009 no calling males were recorded. Two were recorded in 2010 and no males were again recorded in 2011 (Hollis 2013).

Populations between 1300 and 1400 m elevation have only been monitored since 1997. Estimates of numbers of calling males ranged between 45 and 85 until 2002 but less than 10 were recorded each year from 2006 until 2011 (Hollis 2013).

Populations at elevations 950 – 1299 m also have only been monitored since 1997, declining from approximately 120 calling males to around 10 individuals in 2010 and 2011 (Hollis 2013).

A population estimate of 7000 adult males was derived from the 1998 and 1999 surveys, based on population-density estimates derived for the extent of habitat located at different elevations on the Baw Baw Plateau escarpment (Hollis 2004). The corresponding estimate based on the 2010 and 2011 surveys is approximately 1300 (Hollis 2013), a decline of over 80%. Given that this excludes the substantial decline demonstrated for at least the populations above 1400 m altitude, and that the most recent surveys (2014-2016) indicate ongoing decline (Hollis personal communication) the overall decline within the timespan relevant to this criterion is estimated to be substantially greater than 80%.

The data presented above appear to demonstrate that the species is eligible for listing as **Critically Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>

AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:



(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:

The historical extent of occurrence and area of occupancy of the Baw Baw frog were both approximately 135 km<sup>2</sup> (Hollis 2011) but these have now been reduced to approximately 50km<sup>2</sup> as surveys in 2014-2016 have not recorded frogs at elevations above 1300 m above sea level (Baw Baw frog recovery team personal communication). The calculated extent of occurrence is 110 km<sup>2</sup>, and the area of occupancy is 60 km<sup>2</sup> (DoEE 2017). These figures are based on the mapping of point records to 2011, compiled from state and Commonwealth agencies along with museums, herbaria, research institutions and non-government organisations. The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2014.

The species occurs at a single location and a continuing decline is inferred based on the number of mature individuals.

The data presented above appear to demonstrate that the species is **eligible for listing as Critically Endangered** under this criterion, based on B1 (a) (b). However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

#### Evidence:

The current population of adult male Baw Baw frogs is likely to be less than 1250 based on further substantial decline from the surveys presented in Hollis (2013). The sex ratio of the species is unknown but a ratio of 1:1 is likely (Hollis 2004) so the population is likely to be less than 2500 mature individuals. A continuing decline is inferred and all of the individuals are in one subpopulation.

The data presented above appear to demonstrate that the species is eligible for listing as **Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 4. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	< 50	< 250	< 1,000

#### Evidence:

Based on recent survey data the total adult population is expected to be less than 2500 individuals but greater than 1000.

The data presented above appear to demonstrate that the species is **ineligible for listing** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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

#### Evidence:

Population viability analysis appears not to have been undertaken. Therefore, there are insufficient data to demonstrate if the species is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

## **Conservation Actions**

### **Recovery Plan**

There is a current national recovery plan for the species (made in 2011). The actions below are drawn from that plan and input from the associated recovery team.

A decision about whether there should continue to be a recovery plan for this species has not yet been determined and will be made at the time the listing decision is made. The purpose of this consultation document is to elicit additional information to help inform this decision.

### **Primary Conservation Actions**

1. The primary conservation action for the Baw Baw frog is the continuing implementation of the current captive husbandry program (Baw Baw frog recovery team personal communication 2017).

### **Conservation and Management Priorities**

#### **Captive Breeding**

- Improve maintenance and breeding protocols for the species
- Continue the development of an ex-situ captive insurance population
- Establish an in-situ (semi wild) population, and
- Trial reintroduction of captive-bred individuals into the wild

#### **Habitat loss and disturbance**

- Investigate options for enhancing the resilience of the species' habitat to climate change.
- Eradicate cattle remaining on the Baw Baw Plateau;
- Control invasive species (fox and rabbit) within the Mt Baw Baw Alpine Resort and Baw Baw National Park
- Continue control and monitoring of pest plants in alpine resort, National Park and State Forest
- Continue track maintenance, particularly of board-walks, and relocation of tracks away from sensitive wetland habitat.

### **Survey and Monitoring priorities**

- More precisely assess the population size, distribution and ecological requirements of the Baw Baw frog using the established survey methodology.

### **Information and Research priorities**

- Complete a population and habitat model using a spatially explicit, decision support tool to model the impact of various land use scenarios on population viability.
- Understand how weather contributes to natural population fluctuations.
- Understand the potential influence of enhanced greenhouse on the long-term survival prospects of the species.
- Understand the contribution of chytrid fungus to the decline of the Baw Baw frog and how this is influenced by the distribution of reservoir species such as the common eastern froglet.

### **References cited in the advice**

- Barker J, Grigg GC & Tyler MJ (1995). A Field Guide to Australian Frogs. Surrey Beatty and Sons, Chipping Norton, NSW.
- Cogger HG (2014). Reptiles and Amphibians of Australia. 7th edn. CSIRO Publishing, Collingwood, Victoria.
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- Littlejohn MJ (1963). The breeding biology of the Baw Baw frog. *Proceedings of the Linnean Society of New South Wales* 88,273-276.
- Malone BS (1985a). Mortality during the early life history stages of the Baw Baw Frog (*Philoria frosti*). In: Grigg G, R Shine, H Ehmann (eds) Biology of Australasian Frogs and Reptiles. Surrey Beatty and Sons. Sydney. pp 1-5.
- Malone BS (1985b). Status, distribution and ecology of the Baw Baw Frog (*Philoria frosti*). Arthur Rylah Institute Melbourne.
- Skerratt LF, Berger L, Clemann N, Hunter DA, Marantelli G, Newell DA, Philips A, McFadden M, Hines HB, Scheele BC, Brannelly LA, Speare R, Versteegen S, Cashins SD & West M (2016). Priorities for management of chytridiomycosis in Australia: saving frogs from extinction. *Wildlife Research* 43,105-120.

### **Other sources cited in the advice**

- Baw Baw frog Recovery Team (2017) Personal communication by email, June 2017.
- Department of the Environment and Energy (2017). Area of Occupancy and Extent of Occurrence for *Philoria frosti*. Unpublished report, Australian Government Department of the Environment, Canberra.

## **Consultation questions**

1. Do you agree with the current taxonomic position of the Australian Faunal Directory for this taxon (as identified in the draft conservation advice)?
2. Can you provide any additional references, information or estimates on longevity, age of maturity, average life span and generation length?
3. Has the survey effort for this taxon been adequate to determine its national distribution and adult population size?
4. Do you accept the estimate provided in the nomination for the current population size of the taxon?
5. For any population with which you are familiar, do you agree with the population estimate provided? If not, are you able to provide a plausible estimate based on your own knowledge? If so, please provide in the form:
  - Lower bound (estimated minimum):
  - Upper bound (estimated maximum):
  - Best Estimate:
  - Estimated level of Confidence: %
6. Can you provide any additional data, not contained in the current nomination, on declines in population numbers over the past or next 10 years or 3 generations, whichever is the longer?
7. Is the distribution as described in the nomination valid? Can you provide an estimate of the current geographic distribution (extent of occurrence or area of occupancy in km<sup>2</sup>) of this taxon?
8. Has this geographic distribution declined and if so by how much and over what period of time?
9. Do you agree that the taxon is eligible for inclusion on the threatened species list, in the category listed in the nomination?
10. Do you agree that the threats listed are correct and that their effects on the taxon are significant?
11. To what degree are the identified threats likely to impact on the taxon in the future?
12. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this taxon at any stage of its life cycle?
13. In seeking to facilitate the recovery of this taxon, can you provide management advice for the following:
  - What individuals or organisations are currently, or need to be, involved in planning to abate threats and any other relevant planning issues?
  - What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations?
  - Would the development and implementation of a translocation strategy be of benefit?
  - What recovery actions are currently in place, and can you suggest other actions that would help recover the taxon? Please provide evidence and background information.
14. Can you provide additional data or information relevant to this assessment?

15. Can you advise as to whether this species is of cultural significance to Indigenous Australians?